



**GUIDE TO THE
OVER-COATED THERMAL
INSULATION
ADETHERM
SYSTEM**

ADESITAL

WHY CHOOSE THE OVER-COATED THERMAL INSULATION SYSTEM?

The living comfort, in all seasons and in all climates, has now become an essential requirement. Today's everyday environments must be protected from heat and cold, sudden changes in temperature, harmful humidity, the formation of mould and condensation. The new materials and building technologies allow today a high value of healthiness and comfort. The over-coated thermal insulation system plays a primary role in achieving the standards of living comfort currently in force, also allowing to raise considerably the living, performance, economic and environmental characteristics of buildings, especially for existing ones that are often unsuitable from this point of view.

In the context of the recovery of existing buildings, the over-coated system also makes an important contribution to the elimination of the origin of damage in the façade, including in correspondence of beams and pillars.

One of the most important aspects related to the use of an over-coated thermal insulation system is the increase in the market value of the building with improved energy efficiency. The regulations in force on energy adaptation today require high thermal and energy performance and make thermal insulation from the outside the most convenient and effective form of recovery and intervention. This advantage is also boosted by the numerous government incentives that can be obtained.

Finally, the environmental benefit deriving from the reduced consumption resulting from an improvement in thermal insulation is of fundamental importance. The significant reduction in the consumption of fuel or electricity for heating and cooling not only offers an immediate economic advantage for the user, but also contributes to the reduction of consumption and emissions into the atmosphere at a global level.

Thanks to the experience gained through years of studies and research on the subject, today ADESITAL is aware of the need to provide high quality cycles that give guarantees

THE OVER-COAT BY ADESITAL

over time and that can meet the increasing technical and aesthetic needs of the market and comply effectively with the regulations in force.

ADETHERM external over-coated insulation is a system for thermal, and in many cases acoustic, insulation of opaque walls in existing or new buildings. The results are the best living comfort, the elimination of condensation and mould, lower consumption and polluting emissions.

ADETHERM includes a wide range of systems, accessories, complements and finishes which, combined with the appropriate application cycles, offer the most suitable solution for all design requirements.

ADETHERM guarantees the highest level of wall insulation and, in correspondence with thermal bridges, the reduction of energy use, the maximum balance between existing calories supplied and consumed, the optimal index of thermal lag and attenuation factors, for a more efficient energy management of the building.

ADETHERM offers all the products necessary for the realization of your over-coated system, from adhesive to coloured finish, for a quick installation and a high quality result.



LIVING ADVANTAGES

The ADETHERM over-coated system optimizes and regulates the factors that determine an ideal climatic environment: the correct ratio between humidity and room temperature guarantees the best conditions of comfort and well-being for living inside a house. The thermal over-coat of a building is able to balance and reduce sudden changes in temperature by changing the time in which heat is transmitted from the outside to the inside and vice versa. Thermal conductivity and inertial capacity are the values that characterize this flow of heat acting over time. In winter, the system prevents the heat loss by accumulating it in the walls and, through their thermal inertia, a reduction in the time and amount of heat needed to heat the rooms is achieved. In summer, on the contrary, the system protects the masonry from direct sun radiation from the outside, bringing a substantial energy saving and an ideal summer comfort. The over-coat made on the outside of the building envelope is the method that maximizes the effects described above and reduces the presence of THERMAL BRIDGES. The thermal bridge is the part of the structure of a building that has different temperature profiles and thermal characteristics from the surrounding ones, representing a discontinuity in the thermal insulation and creating a heat loss. Considering the temperature curve, in correspondence to a thermal bridge, a gradient is created that is all the more marked the greater the loss and the nature of the thermal bridge. In general, there are two types of thermal bridges:

- CONSTRUCTION TYPE, caused by high thermal conductivity (λ) of certain materials present in the structure (e.g. reinforced concrete beams and pillars).
- GEOMETRIC TYPE, generated by sections in which the internal surfaces develop an area lower than the external one (e.g. the edges and corners of buildings).

The thermal bridge acts negatively both in terms of energy loss and reduction of living comfort, creating:

- A decrease in the overall insulating power of the wall and of the building.
- Loss of thermal performance with heat transmission/absorption in different seasons.
- A temperature gradient that, at the thermal bridge, generates a cooling of the internal surfaces, resulting in the creation of condensation and proliferation of mould and bacteria in the winter season.

The latter point in particular is a real problem in buildings that are not well insulated. Water vapour generated inside the home during daily activities (e.g. cooking, drying laundry, using hot water, talking, breathing, etc.) can lead to condensation in particular humidity and temperature conditions. Considering, for example, an indoor environment with a temperature of 20°C and a relative humidity value of 60%, water vapour condenses when it encounters a surface with a temperature of less than 12°C; if the humidity reaches 80%, condensation is also generated on surfaces of 18°C. The internal surfaces typically cooler in winter are those in correspondence of the thermal bridges and become areas of formation of condensation, fertile breeding ground for bacteria and mould, harmful to human health. This is the reason why thermal bridges should be avoided and, in order to create a high level of living comfort and healthiness, the temperature of the internal surfaces should be similar to that of the environment and in any case higher than the condensation temperature. Please note that "healthiness" is a concept unrelated to the "breathability" of a masonry. In particular, "breathability" means permeability to water vapour, i.e. the ability of the vapour to pass through a surface. Actually, numerous studies confirm that the walls do not "breathe" and this capacity is only minimally exploited. This means that it is not the "breathability" of the walls that disposes of the water vapour generated in the interiors of the houses but the ventilation and airing of the interiors. The reduction of possible condensation phenomena occurs with frequent air changes, which involve a decidedly negligible cost if carried out in a suitably insulated environment and with a wall mass such as to have accumulated a sufficient quantity of heat. Together with the ideal insulation it is therefore necessary to have a good management of the housing operating natural ventilation through windows, dehumidifiers, etc.. or operating forced ventilation through specific equipment.

In addition to these advantages, the ADETHERM over-coat insulation system, using a suitable insulation, considerably reduces noise pollution, one of the most common problems in the city or in noisy places (e.g. railways, airports, etc.). Exposure to noise not

only compromises auditory health, but becomes detrimental to the performance of any daily activity. The ADETHERM over-coat clads, thermally and acoustically insulates in a single application, keeping the application system unaltered, thus obtaining thermal and acoustic protection as well as protection against adverse weather conditions.

PERFORMANCE ADVANTAGES

The ADETHERM system insulates, protects and decorates the external façade of the building, bringing energy and technical performance advantages to the building. The thermal protection allows a reduction of the stresses caused by thermal changes and variations in humidity caused by the climate on the structures. In particular, the ADETHERM over-coat is proposed as an optimal solution for the functional recovery of old structures, preventing various dynamic-structural problems caused by different thermal expansion and shrinkage between diverse building materials. Cracking and crazing that are generated between the materials are reduced by acting on the reduction of temperature changes in terms of values of temperature and of action time.

ECONOMIC ADVANTAGES

ADETHERM OVER-coat, using an insulation with adequate thickness, ensures significant reductions in heat loss, ensuring a reduction in fuel consumption from 30% to 60% and thus generating continuous savings. It has been calculated that the investment made in the construction of a thermal over-coat is amortised over the next four to seven years on average. The convenience in the construction of a over-coat becomes even greater when combined

AVERAGE CONSUMPTION AND COST VALUES OF ENERGY CLASSES

	Consumption kWh/m ² year	Consumption €/year	Saving by class status	Saving €/year
A+	< 15	< € 100		
A	< 30	€ 201	- 52%	- € 214.40
B	31÷50	€ 415	- 39%	- € 268.00
C	51÷70	€ 683	- 28%	- € 268.00
D	71÷90	€ 951	- 22%	- € 268.00
E	91÷120	€ 1,219	- 25%	- € 402.00
F	121÷160	€ 1,621	- 24%	- € 522.00
G	> 160	€ 2,144		

Average values of the energy classes
 Building S/V = 0.25 - Zone D1455 GG (e.g. Rome)
 Square metres 100 net - EPI (primary energy for winter heating) 2010 limits

with the installation of a scaffolding made for other types of intervention such as roof repair, and façades, etc. The ADETHERM over-coat stands out as an extremely competitive system in economic terms and, if planned during the design phase of a new building or renovation of an existing one, it does not involve costs higher than those of traditional construction systems. In many cases, in fact, the cost of constructing an external render is only slightly exceeded in terms of material costs, but this leads to a simplification of the processing phases and in some cases also eliminates the demolition of the old render. Compared to other solutions, the over-coat makes it possible to insulate the structure, considerably reducing the thickness of the external walls and recovering internal space.

ENVIRONMENTAL ADVANTAGES

The ADETHERM over-coat system is one of the most environmentally friendly building cycles, with an extraordinary ratio between environmental costs and performance. The real ecological value of an over-coat system does not lie in the equation natural = ecological, but in its intrinsic capacity to reduce the quantity of pollutants and harmful substances released into the environment and resulting from combustion for heating/cooling buildings. Thanks to the reduction of the use of energy and its dispersions, the thermal over-coat leads to a reduction of harmful gas emissions into the atmosphere, saving energy and limiting the exploitation of fossil resources, helping to contrast climate change. Choosing an ADETHERM thermal over-coat also means strengthening an awareness aimed at saving energy and reducing environmental impact.

THE CORRECT APPLICATION

A correct application is fundamental for the reliability of the system, both for the durability and for the aesthetic maintenance of the façade. Correct installation is just as important as the quality of the materials used.

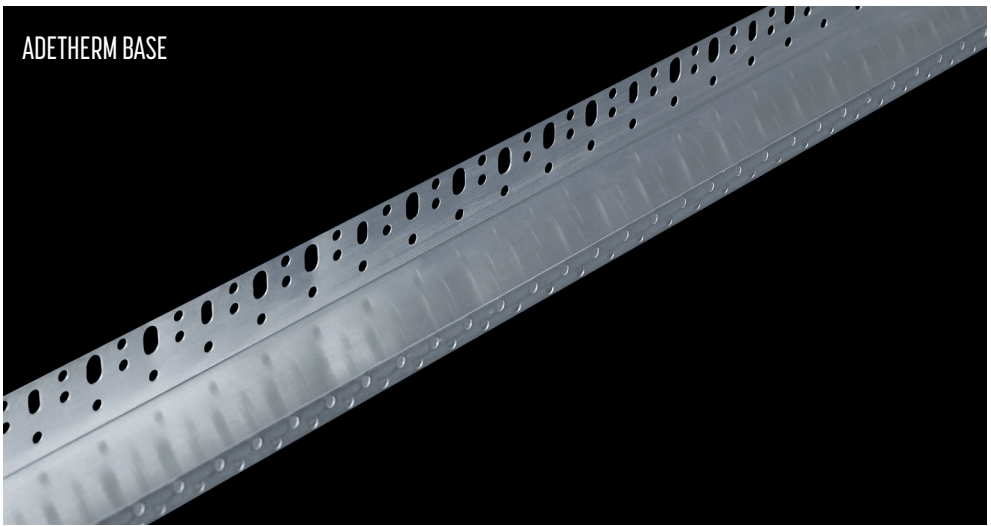
The full respect of the sequence of application steps is an excellent guarantee for the quality of the intervention. The steps and times are to be observed with precision and care: nothing should be overlooked. This is the only way to achieve a correct application that can guarantee the quality of the system. This process involves all the players involved in the project, from the project manager to the owner, from the producer to the installer.

INSTALLATION OF THE BASE PROFILE

As in all processes, it is essential to prepare the substrate in the most suitable way for the specific case.

Determine the dimensions of the over-coat and mechanically fix the aluminium alloy profile ADETHERM PROFILE DI BASE to the ground floor of the building to be insulated with special dowels, with a c/c distance of 40-50 cm.

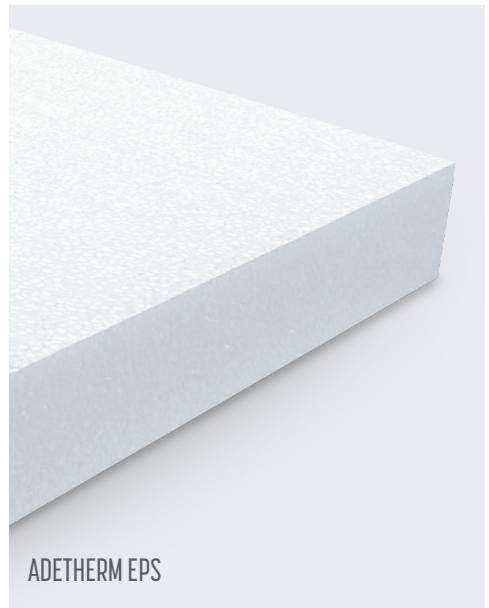
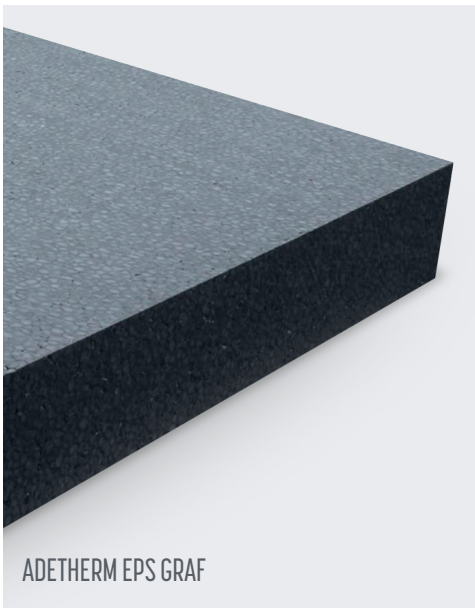




It is important to choose the profile with dimensions suitable for the thickness of the panels to be installed.

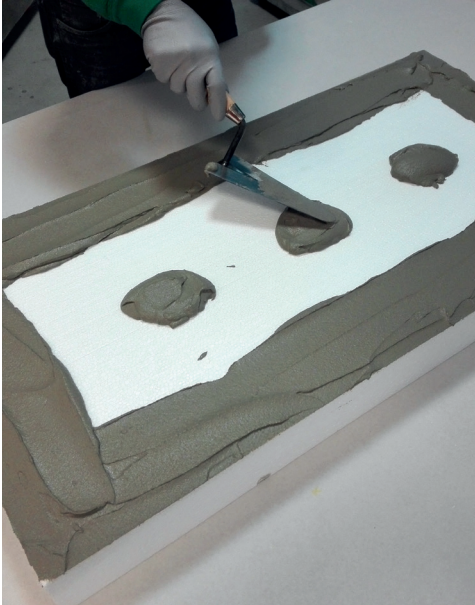
Prepare the adhesive grout ADETERM EXTRA 35 in accordance with the water proportions and the instructions in the technical data sheet.

Apply the cementitious adhesive on the back of the ADETERM EPS, ADETERM EPS GRAF or ADETERM ROCCIA insulating panels and bond the panels to the substrate.



Different application methods can be used for the bonding. The continuous seam with central spots is the most widely used because it locks the entire perimeter and the centre of the slab, making it as integral as possible with the substrate. It is also suitable for uneven substrates, also allowing a slight levelling of the wall.

To ensure an ideal sealing, the adhesive must cover at least 40% of the surface of the slab to prevent air circulation between the substrate and the panel.



The notched trowel method is also often used, with the limit of being a system that can only be used on substrates that are already rendered, very regular and with excellent flatness. It does not allow for the recovery of hollows or irregularities in the substrate.

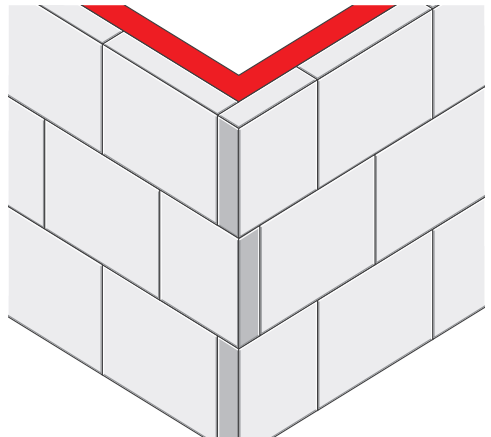
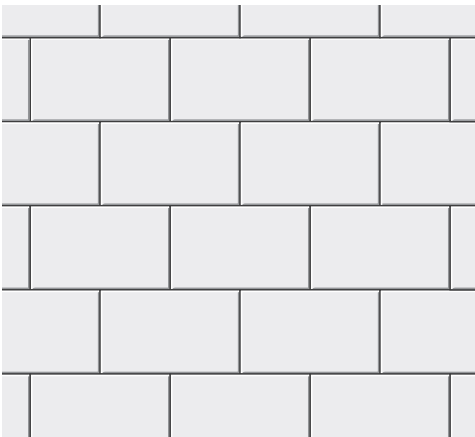
The use of mineral wool in thermal insulation is indicated wherever it is necessary to have special conditions of vapour permeability, thermal and acoustic insulation, especially where an important fire protection is required.

ADETHERM ROCCIA is an insulation product capable of withstanding very high temperatures, does not burn and does not emit toxic fumes. Thanks to the open cell structure of its insulation panels ADETHERM ROCCIA guarantees excellent thermal insulation in summer and winter and absorbs sound waves, greatly reducing the propagation of noise.

ADETHERM ROCCIA mineral wool panels are highly breathable, as the open cell structure regulates the passage of water vapour so as to allow it to pass through the insulation, minimising the risk of mould and condensation.

Mineral wool also boasts a very high ecological sustainability.

It is an inert and bio-soluble material, environment-friendly and resistant to micro-organisms.



The panels must be bonded with tight joints, staggered vertically, proceeding from the bottom to the top.

Scheme for panel joint staggering in the corners

MECHANICAL FIXING OF THE INSULATION

After careful selection of the ADETHERM TASSELLO or ADETHERM TASSELLO PLUS dowel to be used, the panels will be fixed with an adequate number of dowels, always guaranteeing an anchoring depth of at least 4 cm in the sound part of the wall substrate, increasing their number in the perimeter areas of the building.



ADETHERM TASSELLO

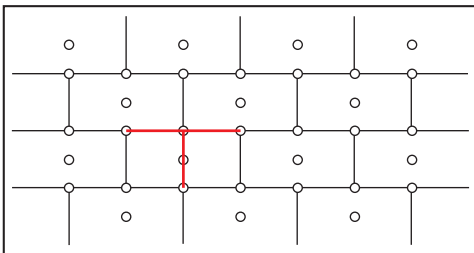


ADETHERM TASSELLO PLUS

The holes for the dowels must be drilled only with hardened adhesive. To do this, use drill bits with an appropriate diameter and hammer drills in impact mode only with concrete or solid bricks. The dowel must be mounted with the plate flush with the insulating panel. Every single dowel must be properly fixed and, if not, it must be removed and relocated nearby. Any small differences in level of the insulating surface must be flattened by sanding the surfaces, or by another suitable system depending on the nature of the panel itself. At least 6 dowels must be positioned per square metre following different schemes, but always taking care to lock the ends and the parts most subject to stress and expansion.

The most commonly used schemes are those known as "T" or "W" schemes.

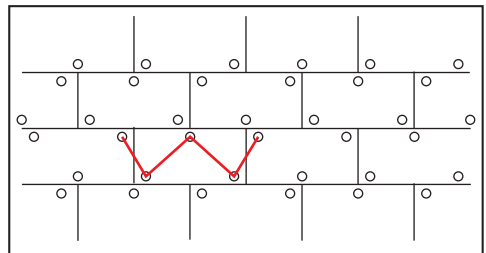
"T" SCHEME



For insulating materials particularly sensitive to thermal changes (EPS, PU):

- Binds the panel in the points most subject to thermal expansion
- Ensures the application in correspondence of the adhesive (with seam bonding and central spots)

"W" SCHEME

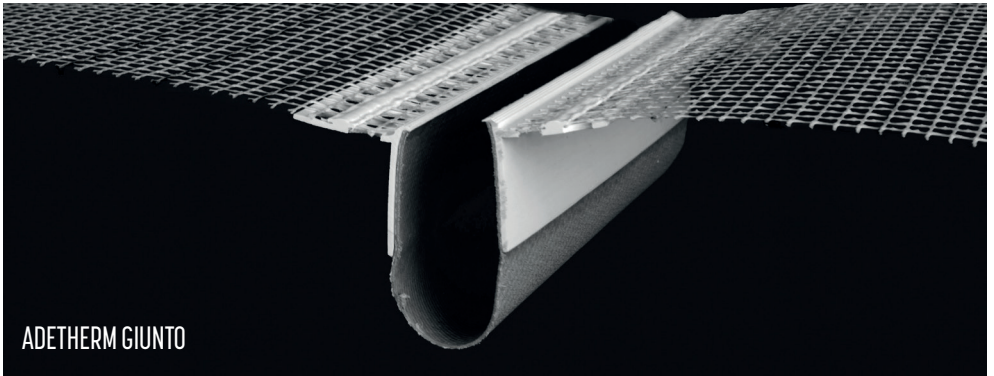


For fibre materials (MW):

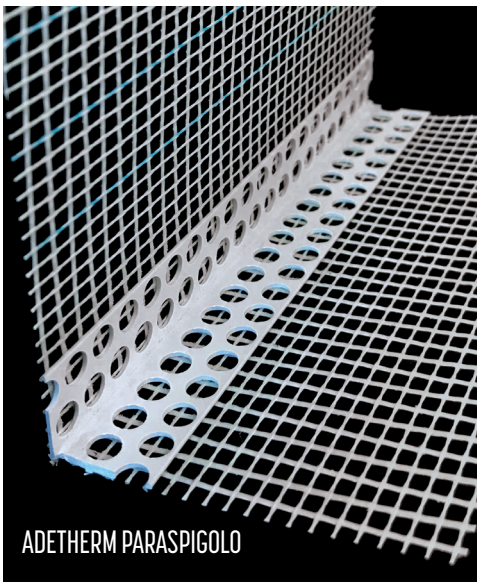
- Counteracts deformation phenomena due to self-stress
- Ensures the application in correspondence of the adhesive (with seam bonding and central spots)
- **To be used mainly for fibre insulation, or in any case not particularly affected by thermal expansion**

REINFORCEMENT AND PROTECTION OF THE INSULATION

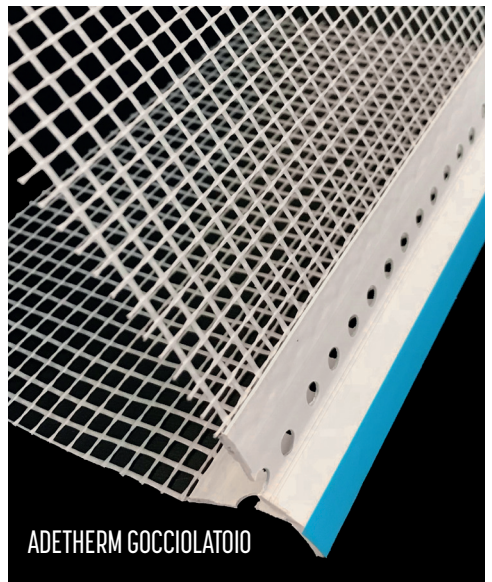
Use adhesive grout to fix the edge protection profiles at all flaps, in order to obtain a perfect flatness and optimal protection. Also fix any other accessory profiles, such as ADEATHERM GIUNTO and ADEATHERM PARASPIGOLO expansion joints to protect the edges of the building.



ADEATHERM GIUNTO

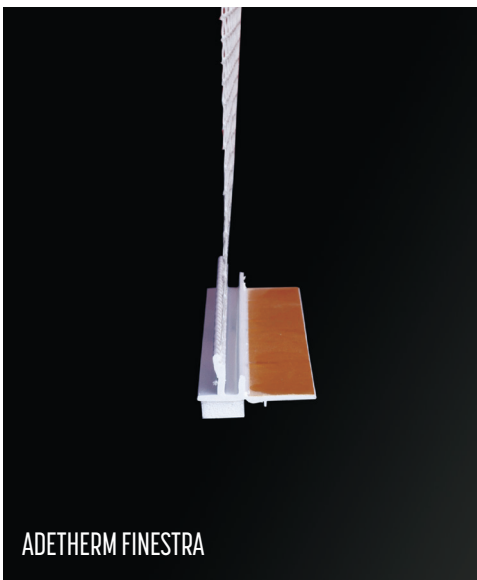


ADEATHERM PARASPIGOLO

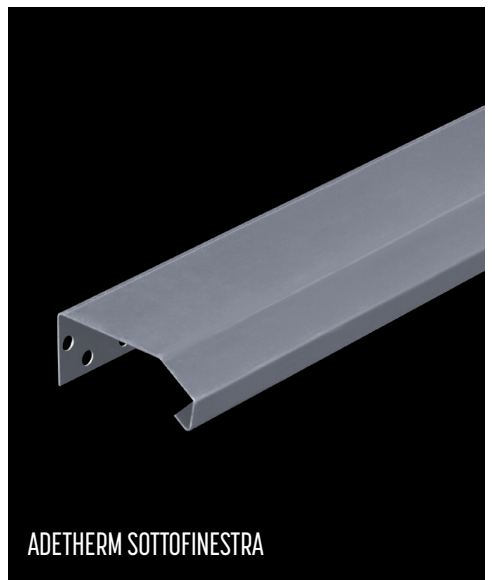


ADEATHERM GOCCIOLATOIO

Apply ADEATHERM GOCCIOLATOIO to kerbs or cornices to prevent future rainwater dripping on the surfaces and, if necessary, apply ADEATHERM FINESTRA and ADEATHERM SOTTOFINESTRA to the windows.

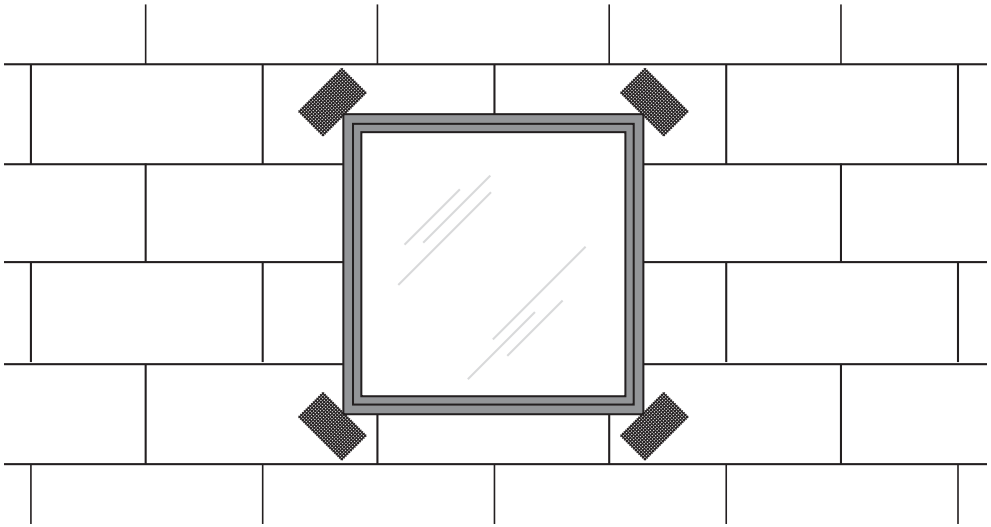


ADEATHERM FINESTRA



ADEATHERM SOTTOFINESTRA

Protect the coated surfaces at the edges of the openings by applying ADETHERM RETE or ADETHERM RETE PLUS, with mesh strips sized approx. 25x40, inclined by 45° with respect to the axis of the openings themselves, in order to reduce stresses that could result in surface microlesions.



Application on the insulation of levelling grout and subsequent burying, while the grout is still fresh, of ADETHERM RETE or ADETHERM RETE PLUS mesh in anti-alkaline, primed and non-detachable fibreglass fabric. The mesh must be buried in the centre of the levelling layer or in the outer third in case of several coats.

ADETHERM RETE / ADETHERM RETE PLUS

The overlapping of the mesh, always applied vertically, must be at least 10 cm and even 15 cm near the flaps. Bury the mesh evenly, not removing the levelling product, but redistributing it over the entire surface avoiding the formation of any folds that should never be eliminated by cutting the mesh.

For the wainscots of buildings and areas subject to accidental impacts, we recommend the use of a special reinforced mesh or the use of a first panel with greater mechanical resistance. Important: the reinforced layer will be completed with a subsequent levelling, once the first layer of gout has completely dried to protect the mesh.

To improve the insulation, where irregularities or other factors make it necessary, it is recommended to apply seals to ensure the durability of the system over-coat. Use a special over-paintable polyurethane sealant to cover holes or cracks between insulating panels and in correspondence of irregularities in the applied layer. The latter is a valid functional support to the elastic compensation of shrinkage and expansion movements in the insulating system. Never seal a gap between the panels with a levelling adhesive.



FINISHING COAT

The realization of the coloured finishing coat to protect the entire system is crucial to have a durability appropriate to the value of the project. Only after the levelling has completely cured, apply the COATS of the ADECOR line scrupulously following the instructions contained in the technical data sheets for the products chosen. Thick coatings must be applied, after a corresponding coat of ADECOR primer to uniform the absorption and improve adhesion, directly on the levelling layer, with processing appropriate to the type of product. Especially at high ambient temperatures, a primer coat is recommended in order to allow for easier application of the finishing coat. The use of strong colours is not recommended and the preliminary application of a coat of acrylic fixing product is recommended in order to maximise the colour hold over time.

ADECOR ACRIL RIVESTIMENTO and ADECOR SIL RIVESTIMENTO thick coatings are applied in one coat. A clear finish colour is recommended, or in any case with a light reflection index higher than 25%. A too low reflection causes a too high surface overheating as a result of direct sunlight, causing possible deformations and stresses that can cause surface damage to the over-coat. Limiting excessive surface overheating minimises the risk of discolouration over time.

It is advisable to provide horizontal and vertical interruption bands, in order not to highlight defects resulting from new applications on old ones. During application, the ambient temperature must be between +5°C and +35°C with relative humidity not exceeding 80%.

An external thermal insulation system cannot be decorated with a paint. This thin-film coating is not provided for by any certification body.



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