
TECHNICAL GUIDE



pietraeco

LA PIETRA RICOSTRUITA FEDELE ALLA NATURA



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1.0 OVERVIEW



Fig. 01

All material used by RASTONE undergoes specific quality controls during all production stages: from the arrival of raw materials to processing of the order. However, we recommend that you check that the model, colour and quantity match those indicated in the shipping document when you receive the goods.

It is important to check that the packaging is intact upon delivery.

Any complaints about the conditions of the packages should be reported immediately upon receipt and specified in the transport document (DDT), which will be countersigned by the carrier (as specified in the “terms of sale” contained in the price list). In any case, the customer has 8 (eight) days from delivery of the goods to report any issues; past this deadline, the material will be deemed as accepted. The material delivered to the construction site must be positioned so as to protect it from bumps/scratches or damage.

More specifically, **the glue ECOCOLLA and the cement plaster (stucco) ECOSTUCCO must be stored in places sheltered from bad weather and moisture.**

Please note that RASTONE ceases to be responsible for material partially or totally applied on surfaces.

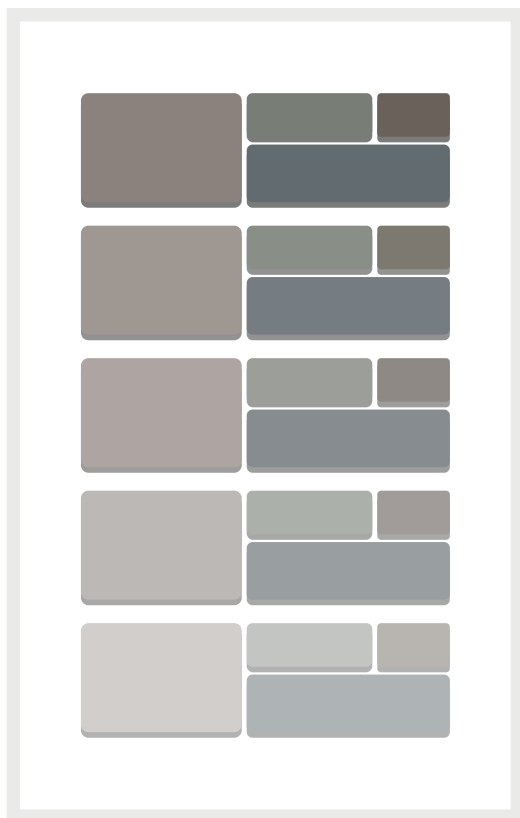


Fig. 02

1.1 PACKAGING

To encourage a rational handling of the material, the manufactured stones are packed **in cardboard boxes** and placed **on wooden pallets** (Fig. 01).

To facilitate installation, **each box contains stones that have already been mixed according to useful formats colour shades.**

In models that require the installation with open joint, **the quantity of material specified on the box and in the documents includes the joints**, in an average of 1.5 / 2.5 cm (4 cm for BRICO PLUS model).

The customer may note minimum differences in the boxes, with a percentage of **+/- 5%** of **excess/lack** in the order, because the product packaging is done manually and the goods have irregular forms and dimensions.

1.2 COLOUR SHADE VARIATION

Material is intentionally packaged when still wet in the production cycle with the hardening, drying and colour setting phases still in progress. This process of rebalancing the colour shade lasts for several months and sometimes even after installation of the product. **For this reason, the material on its arrival may initially appear a decidedly darker colour shade, to then rebalance itself spontaneously, clearing progressively with exposure to light and air.** (Fig. 02)

1.3 CALCULATION OF MATERIAL TO BE ORDERED

Each model of manufactured stone PIETRAECO comes in two basic formats: **flat and corner pieces**. The flat pieces are to be installed on the vertical walls and are ordered by square metre. The corner pieces must be applied to the edges and are ordered by linear metre.

Installing the **corner pieces on edges or around the openings of windows, doors and columns** is aesthetically very important as it gives a nice effect of depth, **three-dimensionality and thus architectural consistency to the work as a whole**.

The quantity of PIETRAECO stones needed to clad a certain area is calculated as follows:

- Determine the linear metres of corner pieces by measuring all the edges that you intend to face, including those of any doors and windows = this gives the **TOTAL LINEAR METRES TO BE ORDERED** (Fig. 03).
- Calculate the total surface area of the walling to be faced, multiplying height by length (Fig. 04).
- Subtract the surface area of any doors, windows and other openings (Fig. 05).
- Subtract corner pieces from the area to be faced, considering that **every 1m covers a surface area of 0.25 m²**.

Total square metres of the work $(B - C) - \text{total linear metres (A)} \times 0.25$
= **TOTAL SQUARE METRES TO BE ORDERED**

A	Measure all corners/edges to be faced = TOTAL LINEAR METRES TO BE ORDERED
B	Measure all the surfaces to be faced = B
C	Measure all openings/windows/doors = C
D	$(B - C) - (A \times 0.25) = \text{TOTAL SQUARE METRES TO BE ORDERED}$

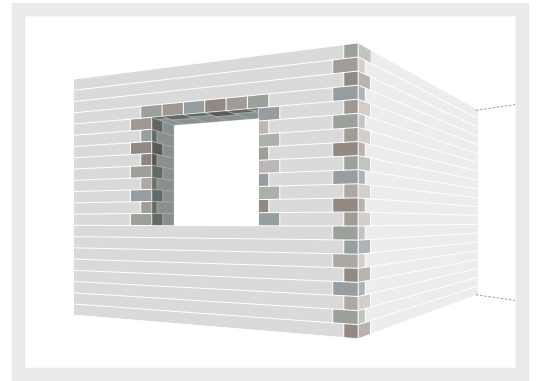


Fig. 03



Fig. 04

1.3.1 Calculation of material for columns

- Trace the total linear metres by measuring the height of all edges to be faced = **TOTAL LINEAR METRES TO BE ORDERED**
- Trace the total square metres adding up the lengths of the base and by multiplying them by the column height = total square metres of the work (Fig. 06)
- Subtract corner pieces from the area to be faced, considering that every 1m covers a surface area of 0.25 m².

Total square metres – Total linear metres x 0.25 = **TOTAL SQUARE METRES TO BE ORDERED**

PLEASE NOTE: We recommend that you face columns or the upper surfaces of partition walls that have sides at least 25 cm wide so as to avoid multiple and aesthetically unappealing cuts of manufactured stone along the height of the column. With these precautions the result of the work will be even more believable. Please note that **in case of smaller sizes, it is possible to “enlarge” the column** with sufficiently thick styrofoam (for insulating purposes) and inclusive of a reinforcing glass-fibre mesh.

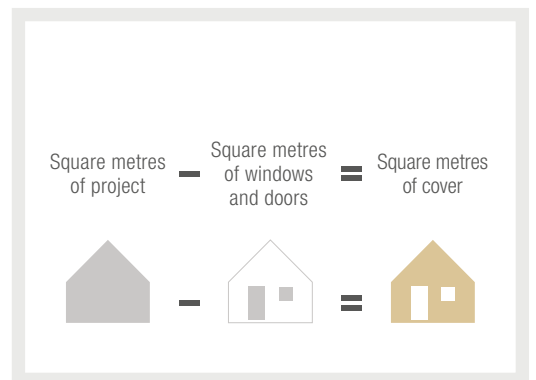


Fig. 05

1.4 SPECIAL PRECAUTIONS

- We recommend purchasing whatever materials you may require for each specific installation in bulk.** RASTONE cannot assume responsibility for the overall aesthetic result and colour if you add other materials after some time.
- The completion time is unlikely to be perfectly in line with the material you first installed.** The differences are caused first of all by the fact that each production batch has its own peculiar aesthetic characteristics, to which you have to factor variations on the material already laid due to weather and the build-up of dust. Therefore, we recommend that you buy the material needed for the work in the actual amount you need and as a single supply.

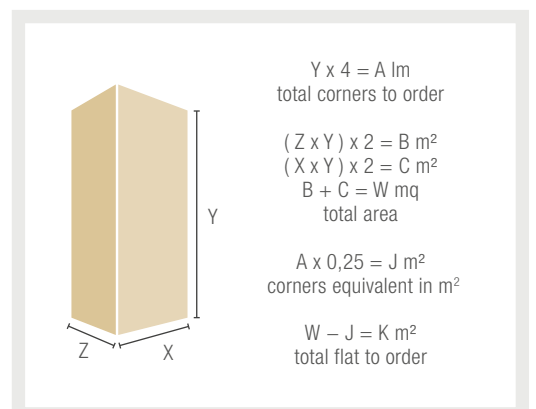


Fig. 06



2.0 DESIGN OF PIETRAECO MANUFACTURED STONE WORKS

The purpose of those who use our manufactured stone PIETRAECO facing solutions is to obtain **an aesthetically beautiful stone covering that is the most truthful, realistic and technically sound and efficient as possible.**

With this concept in mind, **customers have to make sure to plan and install the stone following and respecting certain rules and logics proven by experience, both constructional and aesthetic.**

Observing natural stone masonry, we noticed that they are the result of two materials that diversify and coordinate from time to time: stone and grout, as well as, obviously, the passion and ability of those who process them and apply them creating remarkable and excellent works.

Thanks to a wide choice of models and colours, RASTONE is able to offer facing solutions in manufactured stone PIETRAECO that recall the shapes and colours of different geographical areas.

In addition, within the PIETRAECO PACKAGE, RASTONE offers products that have been specifically designed and developed to facilitate and optimise the installation of artificial stone such as ECOCOLLA and ECOSTUCCO. These solutions are key elements, together with a state-of-the-art installation, to ensure that the work is excellent aesthetically speaking, as well as technically sound and efficient.

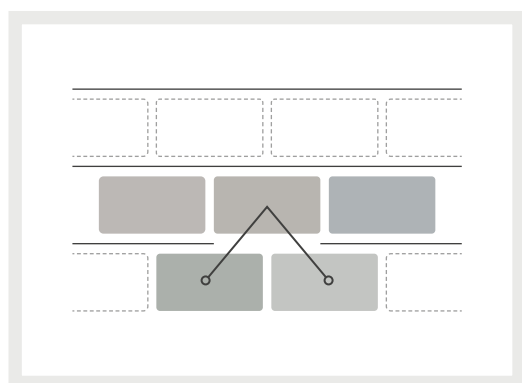


Fig. 07

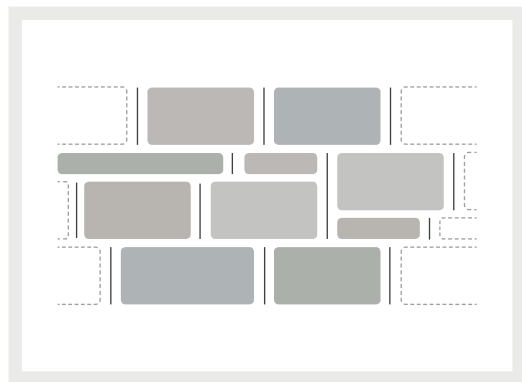


Fig. 08

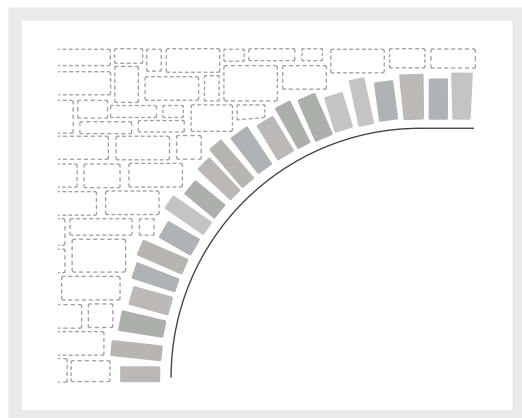


Fig. 09

2.1 INSTRUCTIONS AND SUGGESTIONS

Because manufactured stone is a material applied for purely aesthetic purposes and not structural, below we provide some valuable guidelines to make the work as realistic and credible as possible, consistently with the load-bearing function of natural stone.

HORIZONTAL COURSES

In load-bearing masonry stones are always positioned horizontally. **The stones should be always be applied so that the upper stone leans on other two below (Fig. 07).**

HORIZONTAL AND VERTICAL JOINTS

It is very important to consider how the joints develop to give the correct structural credibility to the work: in this sense, **horizontal joints can have variable length** depending on your taste and the model, while **the vertical joints should stop and not continue past the height of a single stone (Fig. 07 and 08).**

ARCHES AND NARROW HORIZONTAL SPANS

Remember that the load exerted by the forces of a load-bearing masonry work near an opening is distributed across the wall thanks to an arch or in small horizontal spans (like windows and doors) by installing the stones vertically (Fig. 09).

WINDOWS AND OPENINGS

To have a true and harmonious effect in the presence of windows and doors, you have to either face the edges with corner pieces of manufactured stone or create a boundary frame of the same thickness of the stone, so as to cover the limited thickness (Fig. 10a - 10b).

WIDE HORIZONTAL SPANS

In the case of wide horizontal spans, the load exerted by the forces of a load-bearing masonry work is generally distributed on a beam or a support across the opening. It therefore is sufficient to insert a thin support to add aesthetic credibility to the work (Fig. 11).

PARTIAL FACING

If you intend to face only a more or less large part of the wall, you have to make sure that the facing in manufactured stone PIETRAECO is encased inside the wall, either by increasing the thickness of the non-faced wall or by creating a recess in the wall itself. This avoids having to make the limited thickness of the manufactured stone visible and will help make the work more credible, just as a load-bearing wall in real stone.

CORNERS

Interrupting the facing near the edge will give the wall a less real-stone effect or even make it seem clearly "fake". To give three-dimensionality to the work, we therefore suggest that you continue also on the side wall for a length of at least 30/50 cm, so as to make the work more credible (Fig. 12).

WATERPROOFING

In light of the above, given the different problems that can affect the external facing in PIETRAECO, we ought to stress the importance of a precaution that does not directly impact the manufactured stone, but that can have positive repercussions on the facing if properly applied. This precaution consists in waterproofing the construction and the walls on which you will then install the manufactured stone.

For this reason, you need to pay particular attention to waterproofing the perimeter walls, as well as the drain holes, eaves, covers and other parts of the structure, in order to prevent rain water from seeping in between the facing and the installation base and thus making the stone-gluing less efficient over time.

Manufactured stone PIETRAECO is designed to have minimum absorbency and maximum breathability but the base must be arranged so as to avoid water infiltration into the wall.

The ideal solution will have to be developed and recommended by the designer/ builder/waterproofing specialist.

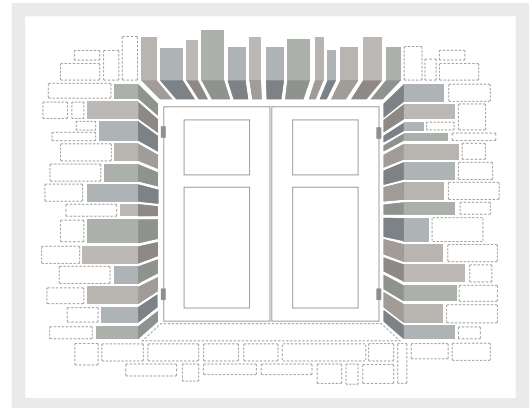


Fig. 10a

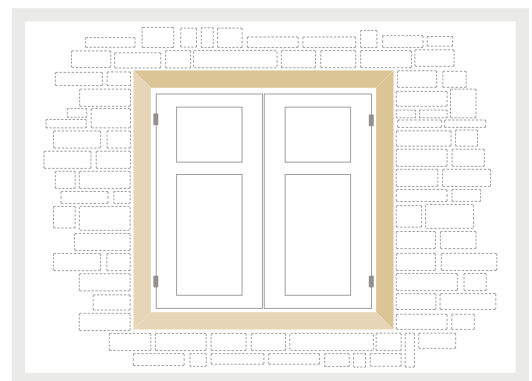


Fig. 10b

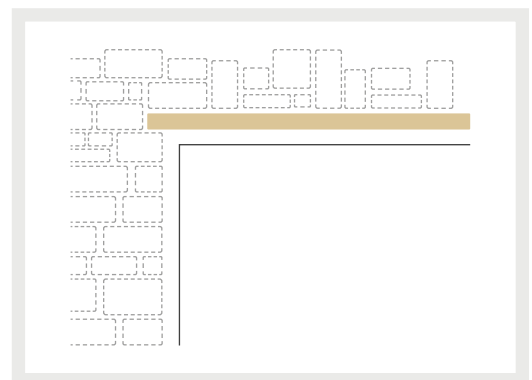


Fig. 11

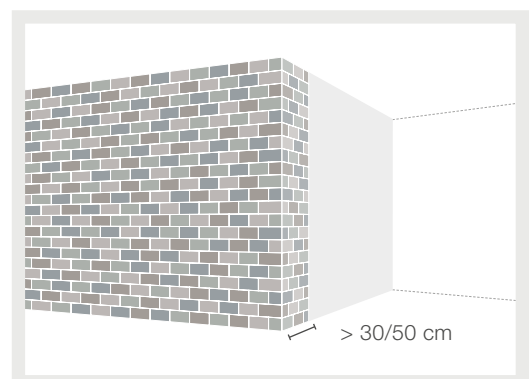


Fig. 12



3.0 INSTRUCTIONS FOR THE INSTALLATION OF MANUFACTURED STONE PIETRAECO

3.1 HOW TO PREPARE THE INSTALLATION BASE

It is the installer's responsibility to assess whether the base is appropriate.

- **art 1667 of the Italian Civil Code:** differences and vices of the work
- **art 1669 of the Italian Civil Code:** ruin and defects of buildings

3.1.1 Basic conditions assessment

It is essential to carefully assess the specific conditions of the installation base in order to obtain the best results and avoid problems that could occur because of flaws in the base. The installer is also required to provide state-of-the-art quality work to customers, as established by the applicable construction laws.

We therefore recommend making sure that you apply PIETRAECO on suitable surfaces built in compliance with construction quality standards. In particular, the installation base should be solid, clean, without the presence of elements that may affect its stability.

3.1.2 Assess the consistency of the installation base

In assessing where and how to apply the PIETRAECO facing, remember the following surface texture requirement: **it is essential that the surface can support a weight that ranges from 20 to 80 Kg/m². This weight is the result of a mix consisting of PIETRAECO (from 10 to 50 Kg), ECOCOLLA (from 5 to 10 kg) and ECOSTUCCO (from 5 to 20 kg).**

You then need to make sure that the glue is applied to a surface with appropriate anchoring properties, i.e. capable of withstanding structural stress between the several elements, which is inevitable.

3.1.3 Reinforce with ECORETE if necessary

When you are working with **installation bases that do not meet the minimum requirements of reliability referred to above**, and therefore with mechanical resistance levels that are not sufficient to support the manufactured stone, **RASTONE recommends using ECORETE, it is a fiberglass net with 16.7x16.1 mm mesh, with anti-alkaline coating treatment. This fibreglass mesh with a specific gravity exceeding 300 g/m² is ideal to provide structural reinforcement to the installation base.**

The operating procedure does not involve any particular difficulties: it begins by applying a thin layer of ECOCOLLA on the base; then you have to dip ECORETE into the layer of glue, making sure that the glue rises above the joints by at least 10 cm and also wraps around the edges. Apply a second skim coat with ECOCOLLA, so that it completely covers the mesh. Then proceed to place the sealing plugs (ECOTASSELLO) (8 mm drill), from 4 to 7 plugs per m² depending on the weight of the facing you have chosen. Use ECOCOLLA again to cover the plug caps (Fig. 13).

Finish off the work by applying PIETRAECO only after the glue dries out and at any rate, not before 48 hours.



Fig. 13



3.1.4 Preparing the installation base when necessary

RASTONE's PIETRAECO can be applied directly on rough untreated walls, mortar, appropriately anchored coatings and able to sustain a facing with variable weight between 30 and 80 kg/m².

Other surfaces instead need to be adequately prepared before installation.

Here are the basic instructions for preparing the installation base (depending on the type of surface):

1. BRICKS (perforated and other bricks)

We recommend that you apply special premixes for a rough coat or that before installing the manufactured stone, you prepare a plaster with suitable mechanical properties.

2. REINFORCED CONCRETE (C.A.)

Remove formwork oils on the surface using acids, and then always rinse the wall with high pressure water jets.

Make sure that there is no veil of water on the surface when applying the glue.

In this case you have to pay special attention to the temperature of the base, as high temperatures could compromise the effectiveness of the glue.

Apply only on walls that are at least 3 months old.

3. AERATED CONCRETE BLOCKS

Apply a reinforced skim coat paying attention to its minimum thickness (such as Gasbeton or Ytong), which must be at least 5 mm.

Check what type of glue is recommended by the manufacturer of the blocks and then completely submerge the ECORETE fibreglass mesh in the glue. Fixing can be performed with the aid **of 4 plugs per m²**, forming a modular net measuring about 45 x 45 cm.

Remember to cover the plug heads with glue. Apply PIETRAECO only once the skim coat has fully dried.

4. THERMAL INSULATING

PLASTERS

The mechanical resistance properties of plasters, which are not capable of sustaining a facing in manufactured stone PIETRAECO, require added structural reinforcement.

It is advisable to apply ECORETE (300 g/m²) immersed in a double skim coat of ECOCOLLA; making sure that the coat covers the joints by at least 10 cm. An effective way of providing anchorage is by using plugs, chosen by type and size based on the characteristics of the substrate; place at least 5 plugs per m², taking care to cover them with ECOCOLLA.

PREMIXES

In the majority of cases, we recommend that after cleaning the installation base from any dust, you **reinforce the base by applying ECORETE immersed in a double skim coat of ECOCOLLA. Once the coat has dried, anchor the entire structure using plugs of shape, length and type appropriate to the base, each no more than 50 cm apart.**

We recommend overlapping the corners with the net and covering the joints by at least 10 cm. Make sure to also cover the plug heads when you apply the next skim coat. Once the coat has fully dried, apply the facing. In case of doubts about the real strength of the base, it is always a good idea to run a shear strength test.

PROBLEMS CAUSED BY MOISTURE

It is a good **idea to remove plaster that is sagging or coming apart by sanding or scraping, until you get a healthy and solid installation base.** Before you apply the coat, wash the surface with water to remove dust or other debris and then skim the surface with ECOCOLLA.

In the case of particularly serious problems, reinforce the installation base by applying the ECORETE drowned in a double skim coat of ECOCOLLA.

Once the coat has dried, **anchor the entire structure using plugs of shape, length and type appropriate to the base, each no more than 50 cm apart.** We recommend overlapping the corners with the net and covering the joints by at least 10 cm. Make sure to also cover the plug heads when you apply the next skim coat. Once the coat has fully dried, apply the facing.

INTERIOR GYPSUM BOARDS

We recommend that at **least one day before installation, you carry out a waterproofing and anchoring treatment using a in-depth fixing agent (e.g. primer). Avoid superficial fixatives that create a film, as this would cause the facing to come apart.** To test the efficiency of the fixative, glue a stone and when dry, run a shear strength test: only if the base tears off along with the stone can you be sure the installation base is solid.

If you prefer to do without treatments, you can use specific adhesives for gypsum and plasterboard.

5. PLASTER BOARDS

Installing plasterboards with an appropriate build (i.e. a reliable sheet structure) creates the conditions to support a facing in manufactured stone PIETRAECO.

We recommend that you choose sheet solutions also to prevent problems with humidity and for smoother installation.

For other types of plasterboard, you will have to **apply a primer to waterproof the base surface**. It is best not to apply the surface primers on the plasterboard, as they will form a film that could then cause the facing to come apart.

To test the efficiency of the fixative, glue a stone and when dry, run a shear strength test: if the base tears off along with the stone you can be sure the installation base is solid. If you prefer to do without treatments, you can use specific adhesives for gypsum and plasterboard.

6. METAL

First of all you need to **coat the entire surface with tarred sheets. Then proceed to apply a welded and galvanised steel mesh with a diameter of about 2 mm and the mesh measuring 5x5 cm, fixed by punching with distances of about 25 cm**; Be sure that your net is well placed even on the corners and that it overlaps the joints by at least 10 cm. In order for ECOCOLLA to completely cover the metal wires when you apply the skim coat, keep the mesh detached from the base by a few millimetres. Apply the facing only once the coat is fully dry.

7. WOODEN AND MIXED STRUCTURES

PIETRAECO can also be applied on wood, though you need to be careful to proceed with caution. **The main structural problem to be considered are the typical movements of wood. That is why installing manufactured stone requires stable conditions to produce a surface independent of the load-bearing one.**

The recommended solutions are the following:

1. Coating with external thermal insulation.

The insulation panel must be glued on the entire surface, clearly showing the expansion joints on the surface, with a suitable glue and immediately fixed with 2 screw anchors per panel. The application of the PIETRAECO coating requires an additional mechanical fixing with self-tapping screws and a tiling scheme 40x40 cm. Alternatively, anti-humid plasterboard sheets can be screwed to the wood, to which the insulating panel will then be applied.

2. Creation of a ventilated fiber-cement wall on a crossed structure.

When we are dealing with particularly uneven walls a viable solution is to create a fiber-cement counter-wall on a crossed structure made of aluminum or steel. The fiber cement sheets are fixed to the structure by self-tapping screws, with a maximum distance of 20 cm from each other and they have to be guaranteed by the supplier to support a coating of approx. 70-80 kg/sqm. It is also advisable to perform a double reinforced spread using ECOCOLLA and ECORETE. The ventilation holes at the ends of the fiber cement have to be done also on the surface of the stone cladding. This is mandatory.

With wooden panels which are not prone to structural movements (such as interlayered beams), we recommend that you first apply a micro-perforated **membrane permeable to vapour** and then a **welded and galvanised** steel mesh with a diameter of about 2 mm and measuring 5x5: for fixing the mesh to the load-bearing structure, use screws or staples at a distance of about 25 cm. Be sure that the mesh is well placed even on the corners and that it overlaps the joints by at least 10 cm. In order for ECOCOLLA to completely cover the metal wires when you apply the skim coat, keep the mesh detached from the base by a few millimetres. Apply the facing only once the coat is fully dry.

8. PAINT OR FILM OF OTHER TYPES OF FINISHES

We recommend that you **remove the paint by sanding or scraping until the installation base is clean and solid**. In any case, before installation, you should wash the surface with water or vacuum to remove dust or small debris. Then skim the surface with ECOCOLLA.

In the case of particularly resistant paints, reinforce the installation base by applying the ECORETE drowned in a double skim coat of ECOCOLLA.

Once the coat has dried, **anchor the entire structure using plugs of shape, length and type appropriate to the base, each no more than 50 cm apart**. We recommend overlapping the corners with the net and covering the joints by at least 10 cm. Make sure to also cover the plug heads when you apply the next skim coat. Apply the facing only once the coat is fully dry.

9. AREAS SUSCEPTIBLE TO WATER AND STEAM

RASTONE manufactured stone does not suffer from continuous contact with water and high humidity, but just like natural stone, it instead is susceptible to substances like chlorine and salt, chemicals or aggressive detergents.



If you therefore want to install PIETRAECO in areas like swimming pools, showers, bath tubs, saunas and steam rooms, you have to follow some specific rules and apply a set of precautions:

1. **waterproof the installation** base using osmotic cement, reinforced with a fibreglass mesh measuring 160 g/m².
2. **apply the stone using specific glue for swimming pools.**
3. wait for the wall to fully dry and apply a protective glaze in case of contact with chlorine and salt, chemicals or aggressive detergents (swimming pools, showers, bath tubs) or waterproof in case of contact with water vapour only (saunas, steam baths).

In areas where PIETRAECO is only occasionally hit by splashes of salt water or chlorine, a water-repellent treatment alone may be sufficient.

10. LOCATIONS WITH A PRESENCE OF FIRE OR HEAT

RASTONE manufactured stone does not suffer particularly from the proximity to heat sources; the only precaution you may want to apply is to make sure **that the surface temperature does not exceed 180 °C, the maximum temperature bearable by glues and grout.** In any case, we do not recommend installing PIETRAECO within braziers or in places where the material will come in contact with fire.

11. INSTALLING MANUFACTURE STONE ON THERMAL INSULATION

PIETRAECO system may be used for both the design of new constructions and for recovery or restoration interventions concerning the improvement of building energy performances.

1. THERMAL INSULATING PANEL installed with suitable adhesive and skim coat.
2. First layer of ECOCOLLA, specific adhesive for PIETRAECO manufactured stone.
3. ECORETE, REINFORCEMENT NET (≥ 300 g/m²) drowned in ECOCOLLA skim coat.
4. MECHANICAL FIXING with proper plugs, selected depending on laying bottom type. **Drill the plug holes using an 8 mm drill deep into the structure (10 mm above the anchorage) and then clean them thoroughly. Arrange the plugs on the surface in a square mesh measuring 40 cm per side (6.25 plugs/m²). In the perimeter areas (2 meters from the edge of the building) increase the number of plugs to 12.50 plugs/m².**
5. Wait 5/7 days. Second layer of ECOCOLLA, specific adhesive for PIETRAECO manufactured stone.
6. LAYING OF PIETRAECO MANUFACTURED STONE with double spread technique, according to the instructions given in the Technical Guide, using ECOCOLLA and ECOSTUCCO specific products.

12. INSTALLATION OVER AN EXISTING COAT

If you want to install PIETRAECO on an existing coat, you need to check **the actual firmness of the underlying coat. In this specific situation it is advisable to fasten it and then anchor it again.**

First of all proceed by removing the layer of saggy plaster or that is coming apart; if necessary, restore it with specific adhesive for the coat or use ECOCOLLA. Then, apply the ECORETE drowned in a double skim coat of ECOCOLLA, securing it to the base with suitable and specific plugs, creating an underlying mesh measuring less than 40x40 cm. Once the coat has fully dried, apply the facing.

If you notice that the external thermal insulation is in unsuitable conditions for applying the plugs and shows signs of cracks and leaks, you absolutely must fully restore the insulating system.



Fig. 14

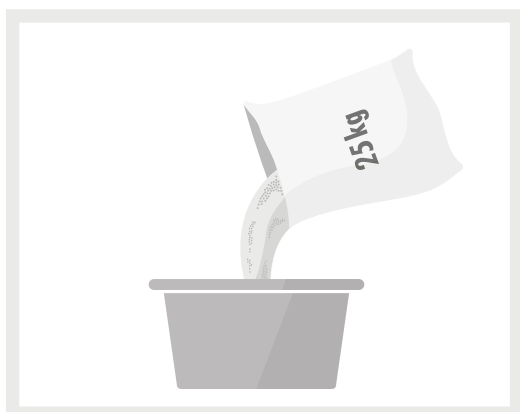


Fig. 15

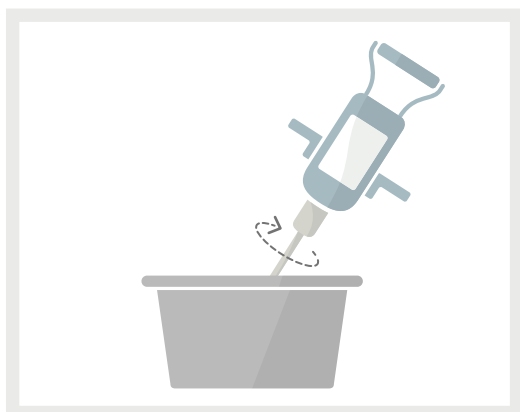


Fig. 16



Fig. 17

3.2 INSTALLATION OF PIETRAECO WITH DOUBLE SPREADING

3.2.1 Characteristics and preparation of ECOCOLLA

ECOCOLLA is specifically designed as adhesive for laying of PIETRAECO manufactured stone, for inside and outside use. ECOCOLLA is an improved cement-based adhesive, with limited slipping, extended open time and high thixotropy and it is available in 25 kg bags, in WHITE and GREY colours. ECOCOLLA, when mixed with water, becomes a soft mixing that is very easy to install. If it is combined with glass fibre mesh ECORETE, it is also a suitable adhesive to make reinforced concrete skim coat consolidations on unstable bottoms or for supporting reinforcement on external thermal insulation.

INSTALLATION PROCESS

In a bucket containing about 4.5 litres of water (Fig. 14), slowly pour and stir a 25 kg bag of ECOCOLLA (Fig. 15). Mix on low speed and then faster until you obtain a homogeneous mixture; then add the water and mix at low speed (you will need 5-5.5 litres of water for a total 25 kg) (Fig. 16). Let the mixture rest for about 3 minutes and then proceed to apply it on the surface after mixing again a little. Do not prepare the mixture without the aid of a mechanical stirrer.

Apply a thin layer with the smooth side of the spatula, pressing firmly on the surface, which will improve adherence and reduce water absorption. Then spread the adhesive using the notched spatula (6×6 mm, space 12 mm) adjusting the thickness by tilting the spatula. To glue manufactured stones, you need to apply a skim coat of glue on the back side of the stone (thicker where there are cavities and fully smoothened where the stone is smooth: to do this, the surface must be as flat as possible in order to increase the contact area). At this point, forcefully press the stone against the support, making any excess glue drain out.

If the stones tend to slide down, use ECOCOLLA with a more solid consistency; always keep in mind that after about 15 minutes, the stones can no longer be detached or moved.

SPECIAL PRECAUTIONS

- Do not use with temperatures below +5 °C and above +35 °C.
- If the temperatures are especially high, check that the surface does not exceed the critical values for the adhesive and that the water doesn't evaporate too fast from the glue. If so, proceed by wetting the installation surface first with water and if necessary, even the back of the manufactured stone PIETRAECO, then when the materials are dry, proceed with the installation.
- If the temperature is too cold, close to zero or with risk of frost, suspend the installation and cover the treated surface.
- Do not add water to speed-up the installation process while using the product.
- Do not add other material that is not included in the data sheet.
- Comply with any structural joints.

AVERAGE CONSUMPTION OF ECOCOLLA

	Installation with double spreading
STONE installation depending on the laying surface	7-9 kg/m ²
Corner STONE installation	3-4 kg/lm
BRICK installation depending on the thickness of the brick	3-5 kg/m ²
Corner BRICK installation	2 kg/lm

3.2.2 Installation process

1. CHOOSING AND PREPARING THE MATERIAL ON THE GROUND

Before you start, distribute a sufficient amount of stones on the ground near **the installation site**, **taking them** out of different boxes and picking them off several pallets, so that you have a broad choice of shapes, sizes, colours and thicknesses (**Fig. 17**).

2. TRACING THE COURSES

Trace horizontal lines on the wall to be faced that are 20/30 cm apart, which you will use as reference for installation (**Fig. 18**).

3. PLACEMENT OF CORNER PIECES

If you need to install corner pieces, **arrange them starting from the corner alternating the long side and short side**, and then apply the flat pieces (**Fig. 19**).

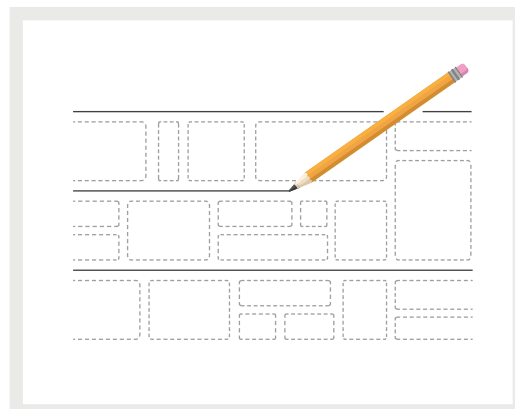


Fig. 18

3.2.3 Installation with double spread technique

PREPARATION

Before you install the stone, **with the aid of a damp plastic brush**, remove any dust or dirt from the back of the stone.

DOUBLE SPREADING

Always spread two layers of glue, one on the wall and the other on the back of the manufactured stone (**Fig. 20a - 20b**).

This technique is fundamental outdoors as it guarantees installation without cavities, preventing damage caused by rain infiltration.

Spread a layer of glue over of a perfectly clean and previously prepared support. Make sure you do not cover too much surface area as the glue may harden before laying the stones and not adhere properly.

Then apply a layer of glue on the back of the stone and install it by pressing it lightly and moving it around a bit, vertically for corner pieces and to the side for flat pieces, until the glue leaks out of the stone's edges. Remove excess glue with a trowel before it hardens to avoid ruining the stones.

PLACEMENT OF STONES

It is very important in order to give the wall a more credible look to keep the courses horizontal. For open-joint models, place the stones about 1.5/2.5 cm apart.

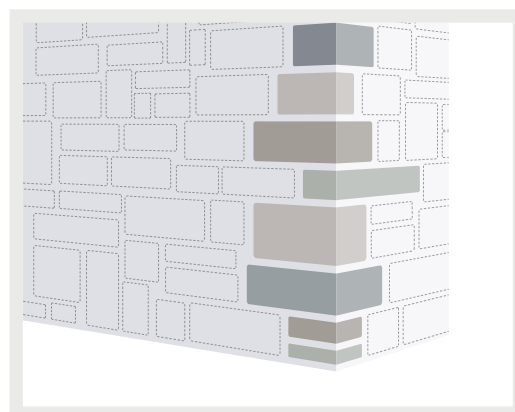


Fig. 19

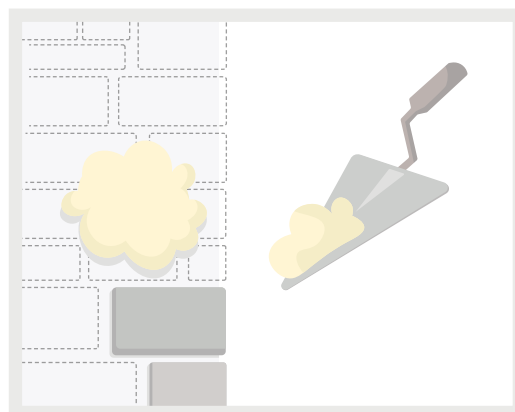


Fig. 20a

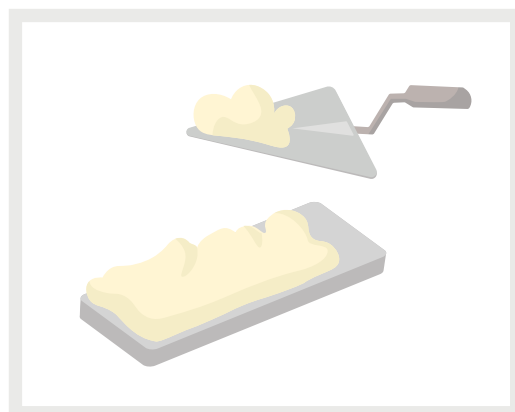


Fig. 20b

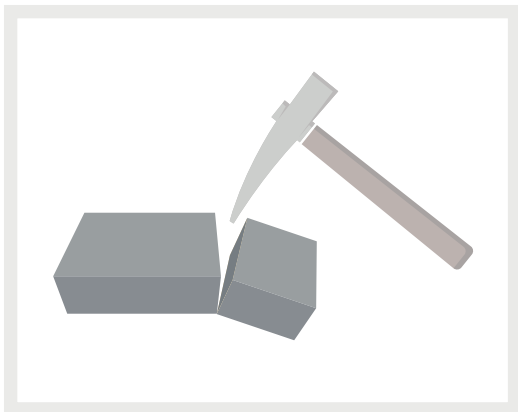


Fig. 21

CUTTING AND PROCESSING

To obtain a better final result, **cut or shape the manufactured stones with the aid of hammers, wide pliers or the sharp end of a trowel. Straight cuts can be made with a diamond blade (Fig. 21).**

The cut stones must be laid so as not to be visible on their cut side (placed downward when the stone is below eye level and upward when it is above). Use thin stones to conceal any cuts better. To do this, you can use stones that have been broken during transport.

3.2.4 Special precautions

- During installation, **do not soil the stone with ECOCOLLA** and always work with clean hands. Any glue stains must be cleaned with a sponge and clean water. Treat only the affected area to avoid haloes.
 - **Leave the joints free**, with the stone installed close to it.
If you need to conceal the joint, proceed as follows: paste the stone on one side of the expansion joint (obviously the one with more resting surface), leaving it free from the glue on the other side. By doing so, the joint will contour the shape of the stones and becomes invisible when you are done cement plastering the surface. Possible cracks in the plaster over time can be fixed simply by replacing the grout (Fig. 22).
 - The modular models Runner, Arcadia, Kronos, Petra and Inka, consist of modules of mixed heights and lengths. Because they are produced naturally like all the other series, they do not have adjusted profiles like ceramic products. They may display slight irregularities near the edges, which can be fixed when installing the product (if necessary) with the aid of a diamond blade.
- For models that require dry installation, always use the double spreading technique, then apply ECOCOLLA both on the bottom wall and on the entire back side of PIETRAECO (do not install it in "points"), so that the stone adheres to the surface when you apply pressure and make light movements to the side to ensure perfect adherence. Make sure also that you drain out any glue on the lateral edge of the stone, without getting the surface dirty. With this last procedure, besides ideal surface fixing, you will also obtain good perimeter anchoring with the surrounding stones.
- The two types of manufactured bricks BRICO SLIM and BRICO SLIM MEGA are both very thin (only 7 mm), so we recommend that you use them only on completely solid walls that do not move at all. Otherwise, they would be highly susceptible to stress and could easily break.

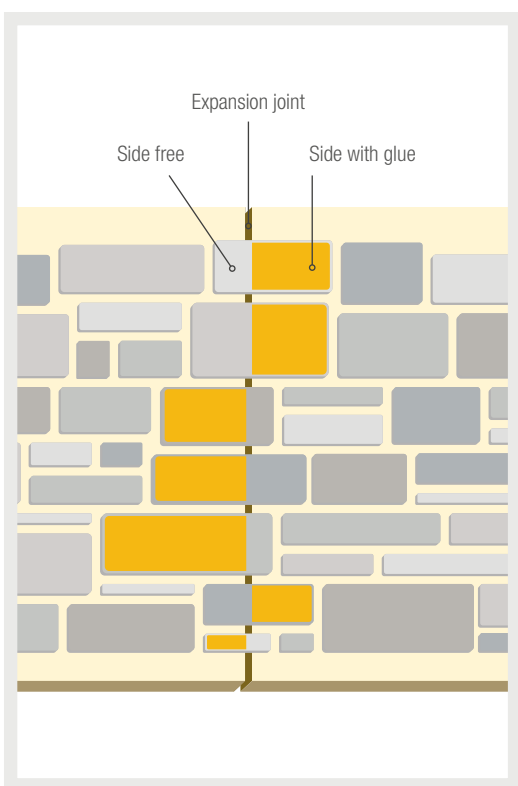


Fig. 22

3.3 INSTRUCTIONS FOR PIETRAECO STUCCO FINISH

3.3.1 ECOSTUCCO characteristics and instructions for use

ECOSTUCCO is a specifically designed grout for grouting PIETRAECO manufactured stones joints and it is prepared on the basis of their characteristics. ECOSTUCCO is a pre-mixed powdered hydraulic binder based grout and it is used for grouting inside and outside manufactured stones joints. It is available in 25 kg bags and in 5 colours: WHITE, BEIGE, BROWN, GREY and DARK GREY. ECOSTUCCO fluidity makes it suitable for its insertion in the joints through the proper piping bag. If it has the right consistency it does not drain, avoiding the risk of dirtying the stone. It does not recede during the drying and it perfectly adheres to stone walls and bottom.

COLOURS

ECOSTUCCO comes in a range of colours: WHITE, BEIGE, BROWN, GREY AND DARK GREY, precious colour shades selected from soils and mortars that are typical of Europe. All colour variations have been specifically designed to enhance and blend perfectly with the colours and properties of PIETRAECO manufactured stone (Fig. 23).

- WHITE recalls the typical lime-based mortars and is ideal for mixed surface treatments.
- BEIGE takes its shade from clay residues and goes well with all stone colours.
- BROWN, tending to a rosy beige, is ideal for coffee coloured surfaces.
- GREY, where the predominant grey shade nicely complements greenish hues, is perfect for grey stones or light coloured stones when you want to highlight the colour of the joint.
- DARK GREY is a dark colour used mainly to cement plaster anthracite grey stones.

PREPARATION

Mix with about 4 - 4.5 litres of clean, fresh water (Fig. 24) each 25 kg bag of ECOSTUCCO powder (Fig. 25), until you obtain a homogeneous mixture (Fig. 26). Adjust the texture depending on the surface conditions and temperature. With very absorbent surfaces and summer temperatures keep the mixture slightly more liquid, otherwise keep it more dense with wet material or winter temperatures (not less than 5 °C). Apply the stucco obtained with the above procedure using the special bag dispenser supplied by RASTONE cut at one end with a hole large enough for the joint. When applying the grout, make sure no stone pours out, as this will permanently stain the stone.

APPLICATION

Apply the grout obtained with the above procedure using the special bag dispenser supplied by RASTONE cut at one end with a hole large enough for the joint (normally 1.5/2.5 cm for Brico Plus 4 cm). When applying the grout, make sure no stone pours out, as this will permanently stain the material. Inject the grout into the joint and make it rise up to the desired limit, being mindful of any structural joints and remembering not to leave any hollow points (without material).

Once you have started the plastic step of the process, when the material is no longer wet when touched with a finger, "soften up" any rough parts with a wooden stick to make the surface homogeneous. Once you have started to dry the surface grain, clean it with a sorghum broom.



Fig. 23



Fig. 24



Fig. 25

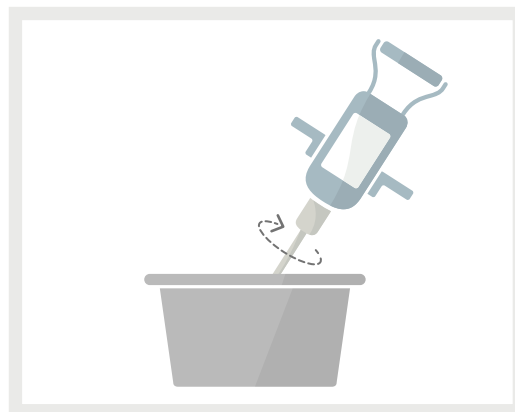


Fig. 26

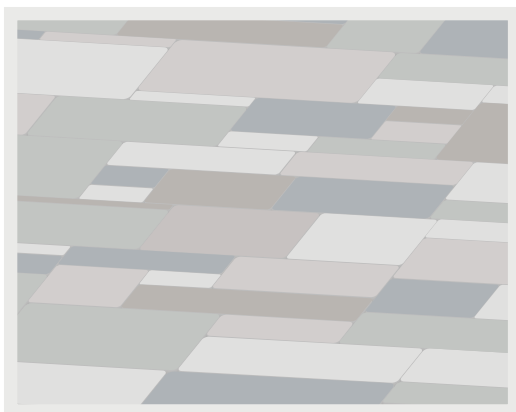


Fig. 27

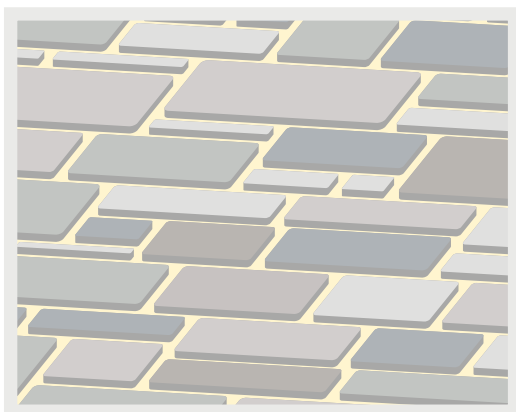


Fig. 28

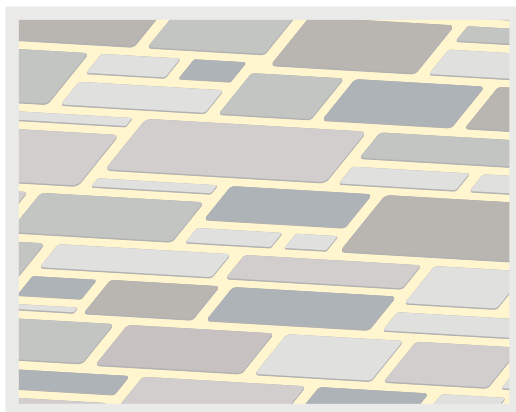


Fig. 29

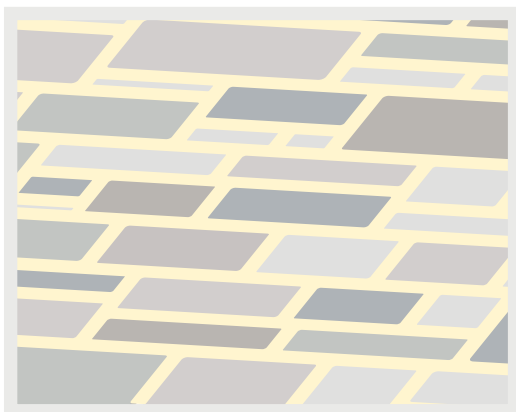


Fig. 30

3.3.2 Types of joints

Besides the laying modalities described above, grouting operation is essential as well. Plaster colour, joint quality and different techniques used, in fact, are considerably influential on the end result and they may modify the work's final look. ECOSTUCCO expands the possibilities of grouting finishing, depending on its manufacturing process. We can obtain any type of finishing: from the smoother and more homogeneous up to the rougher, that is typical of the old natural mortars. Manufacturing times are essential to choose the surface roughness.

MAIN TYPES AND SPECIFIC INSTALLATION PRECAUTIONS:

- **DRY STONE/RETOUCH**, in this laying typology, PIETRAECO single manufactured stones are installed next to each others. We recommend plastering with ECOSTUCCO in case of open joints (Fig. 27).
- **NORMAL JOINT**, in this laying typology, the plaster is inserted for a layer thickness of about 2/3 cm, depending on the ordered model. The stone last centimetre is left empty and then the plaster is pulled (Fig. 28).
- **FULL JOINT**, in this laying typology, the joints are completely filled with plaster. Then the plaster is pulled with small trowels (Fig. 29).
- **OVER JOINT**, in this laying typology, the joints are completely filled with plaster. After about 20 minutes, we recommend pressing the plaster in the joints with a round profile trowel, putting the mortar near and on stone surface (Fig. 30).
- **COARSE GRAIN EFFECT**, to obtain a much more rough effect, as by real ancient stone walls, you have to mix the volcanic inert with our ECOSTUCCO. One 7,5 L bag of inert into a 25 kgs bag of ECOSTUCCO.

AVERAGE CONSUMPTION OF ECOSTUCCO	Dry joint /retouch	Normal joint	Full joint	Over joint
Grouting STONE depending on the thickness	1 kg/m ²	7-9 kg/m ²	11-13 kg/m ²	18-20 kg/m ²
Grouting BRICK depending on the thickness		3-4 kg/m ²		4-6 kg/m ²
Grouting BRICO PLUS with joints 4 cm		20-22 kg/m ²	40-44 kg/m ²	
Corner grouting	1 lm = 0.25 m ²			

3.3.3 Grouting of manufactured stone PIETRAECO: process steps

1. **Cut the bag dispenser on one end, forming a hole of about 1.5/2.5 cm**, depending on the model you have chosen.
2. **Place the grout you have prepared inside the bag dispenser**. The grout must be neither too wet or too brittle and neither too damp or too dry.
3. Hold the bag dispenser with one hand only and use the other to grab the bag on the back: this will create pressure that will push the material outside the hole (**Fig. 31**).
4. **Carry the tip of the bag dispenser all the way to the joint's end, slightly tilted on one side**. When injecting the material, move at a speed sufficient to pour out the desired amount of mortar into the joint (**Fig. 32**).
5. **Start working the grout only when you sense there is no more water on the surface, pressing it with a wooden stick and working it to taste or as necessary** (**Fig. 33**).

IMPORTANT:

- Never work the grout while it is still soft.
- Do not use spatulas, brushes, brooms or wet sponges.
- Absolutely avoid smoothening the joints using wet sponges or brushes.

You can also use a spatula or trowel for special mortar works, e.g. to recreate the different possible groutings.

6. **Use a fully dry, soft broom or sorghum broom to clean the surface**, being mindful of the time it takes the grout to harden based on the finishing technique you are applying (never clean the surface immediately after having grouted it, but always wait for it to be completely dry) (**Fig. 34**).

3.3.4 Special precautions

Because it is a natural product, **the colour of mortar may vary depending on several factors, such as the installation method, temperature, humidity and drying time. For this reason, if possible, complete the wall grouting (from edge to edge) in a single session and do not leave the job half-done.**



Fig. 31

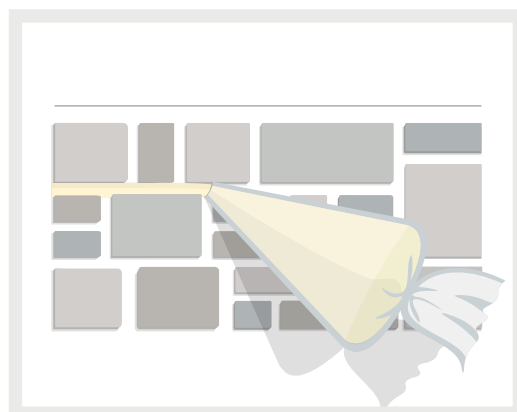


Fig. 32

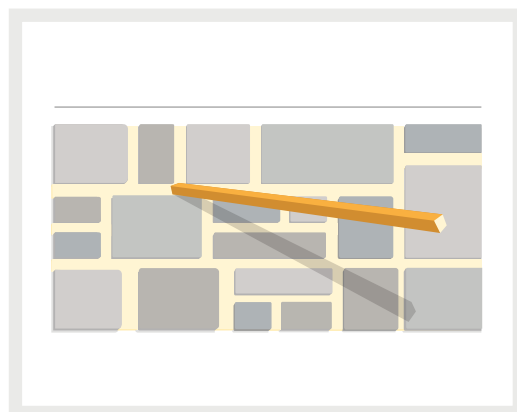


Fig. 33



Fig. 34



4.0 CLEANING AND TREATMENT OF PIETRAECO

4.1 CLEANING INSTALLATION DEBRIS

Absolutely never soil the stone during installation; for this reason, it is a good practice to always work manufactured stone with clean hands. Glue stains should be removed immediately with the aid of a sponge and clean water.

When grouting the surface, it is very important to follow the instructions in this guide, as the grout may permanently stain the stone's surface.

If you need to clean the surface after installation and once it is dry, proceed as follows:

1. Remove the hardened residues with the aid of a wooden stick.
2. Clean the streaks and stains from grout wetting the stones abundantly with water, then wipe gently with a damp sponge with a solution of 5 parts water and 1 part white vinegar.
3. Rinse well with clean water.

4.2 ROUTINE CLEANING

Dust off the brickwork with a brush/dry broom.

Use only tools with soft bristles (sorghum) so as not to scratch the material. Only after this procedure can you clean the surface with clean water, proceeding as follows:

1. Prepare the stone, wetting it with abundant clean water only.
2. Rub gently with a soft brush if necessary soaked in a mild soap and water solution that does not contain bleach or other harsh chemicals.
3. Rinse with clean water.

4.3 EFFLORESCENCE

If salt forms on the stones due to water moving from the surface to the facing stone, wait for it to dry out completely and then remove the salt with a sorghum broom. Any marks can be removed using a solution of 5 parts water and 1 part white vinegar, rubbing gently with a soft brush. Rinse well with clean water.

4.4 TREATMENTS

Manufactured stone PIETRAECO was designed as a material for use outdoors and therefore has intrinsic properties of lasting long with good resistance over time, without the need for added work, and hence does not need any treatment. Only under special circumstances, where there are external influences that can contaminate or corrode the stone, may the need arise to apply a specific treatment. If the work could be attacked by deteriorating and/or aggressive agents such as sea water, sea salt, chlorine or chemicals, it is good practice to use a protective treatment. The recommended treatments are meant to improve the waterproofing of the surface while leaving the pores open for transpiration. Hydro-oil repellent treatments are available on the market that are water-based or solvent-based, depending on your specific needs.

These treatments need to be regenerated over time by spraying on the affected area a second time. We recommend to test treatments on a small portion of the surface before you proceed with the full treatment, in order to make sure there are no undesired colour variations.

4.5 SPECIAL PRECAUTIONS

- **NEVER use wire brushes on manufactured stone PIETRAECO.**
- **NEVER attempt to clean manufactured stone PIETRAECO with acid detergents.**
- **NEVER clean manufactured stone PIETRAECO with high pressure water jets.**



5.0 WARRANTIES

Laying of RASTONE products must be performed in compliance with building standards of every country and according to the manufacturer instructions.

THE GUARANTEE DOES NOT INCLUDE:

- Structural movements of any kind;
- Defective foundations in the construction;
- Material incorrect use and fastening system defective in the laying;
- Contact with chemical products, paintings or not appropriate surface treatments and de-colouring caused by contaminants;
- Dirt, oxidation.

Failure to comply with the suggestions specified in the technical guide and non-use of ECOCOLLA and ECOSTUCCO products for the laying, exempts RASTONE from any liability for misuse or defective laying.

This warranty covers product manufacturing defects but excludes defective material pick up and replacement costs.

STANDARD TESTS

Reference standards for the determination of mechanical and physical characteristics of manufactured stone, adhesives and grouts:

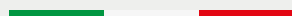
- Bulk density and water absorption UNI EN 14617-1
- Compression and bending resistance UNI EN 14617-2
- Resistance to freezing and thawing and flexural strength after freeze-thaw cycles UNI EN 14617-5
- Resistance to thermal shock and bending resistance after temperature changes UNI EN 14617-6
- Coefficient of thermal expansion UNI EN 14617-11
- Dimensional stability UNI EN 14617-12
- Compression strength UNI EN 14617-15
- Coefficient of heat conductivity UNI EN 12667
- Fire resistant - non-combustible
- Colour unchanging to light, we do not observe any undesirable colour change, even after many years of exposure. We use colours made up of permanent mineral oxides of the highest quality; the colour consolidates after 2/6 months from the weather exposure.

ECOSTUCCO UNI EN 998

ECOCOLLA UNI EN 12004

pietraeco

LA PIETRA RICOSTRUITA FEDELE ALLA NATURA



Rastone Srl unipersonale

Via Leonardo da Vinci, 762 - 24040 Barbata (BG) - Italia
tel. +39 0363 914902 - fax +39 0363 905320

info@rastone.com - www.rastone.com

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