FTC-OO6

Medium Roman Marmorino

DESCRIPTION OF THE PRODUCT

Historical introduction:
"Roman Marmorino" is a stucco (from the Lombard word "sthukki" meaning shell or peel) made up of lime putty and marble dust. It has been used for centuries for the creation of decorative and protective plaster (in Venice it was used as a "sacrificial layer" to protect brick factories from the prevailing humidity).
Marmorino stucco (known to the Romans as Opus Marmoratum) was widely used in the Roman Empire and this caused it to become known around the world. The word possibly derives from the slight toning that the different types and colours of the marbles used to obtain the aggregates gave to the stucco. These were normally used to colour the surface of the stucco with inorganic pigments and limewater, which we know as fresco painting, in the form of smooth paint or beautiful outlines. Mass colouring appeared a lot later, as is the case of coloured "Marmorino" and polished Venetian stucco.
This stucco is based on the binding action of rich aerated lime (high-calcium lime without impurities, called rich lime in accordance with compulsory standard CL90 S UNE-EN459-1:2001 in all countries belonging to the EU). This is obtained from the heating of pure limestone (95% calcium carbonate) to 900ºC, thereby releasing carbon di-oxide (CO_2).

$$\text{Limestone} + \text{Heat} \Leftrightarrow \text{Calcium Oxide} + CO_2$$

When the calcium oxide (quicklime) is mixed with water (slaking of the lime) it is transformed into calcium hydroxide dust or paste, depending on the amount of water added. Once the stucco is mixed with lime paste and marble powder and applied to the support in the open air, the lime starts to recover the CO_2 that it lost in the oven and turns back into calcium carbonate, the stone from which it originated.

The formulation of Marmorino is an authentic "alchemist's" process, involving the four elements:

- Fire; to heat the rock and obtain the lime.
- Earth; inorganic oxides to provide colour.
- Water; to create the lime paste and wet the stucco.

- Air; to recover the CO_2 lost and begin the process of carbonation.

There are two main ways in which stuccos are different from mortar and lime:

- The proportion and type of lime in the paste is much higher and richer in stuccos than in mortar.
- The type of aggregate used in stuccos is always marble powder.

These traditional stuccos, when combined with "puzzolanas" (volcanic ash) or "coccio pesto" (broken pottery), i.e. crushed terracotta bricks or tiles, has hydraulic properties. It is the famous "Roman cement" used to plaster Roman baths, wells, the inside of aqueducts and façades before the application of decorative plaster.
Throughout history, many different application techniques have been developed to complement traditional finishes such as smooth washing, trowelling, pitting, carving, graffito, "fresco" finishes, "encaustic" finishes, cold polished, polished with hot soap and Tadelakt. This concludes our brief summary of the origins of this ancient wall lining.

These days there are contemporary finishes, such as MEDIUM ROMAN MARMORINO, adapted to new concepts of space such as imitations of slabs / concrete, bicolour effects, pearl or metallic finishes, imitations of cortex steel and abstract effects.
MEDIUM ROMAN MARMORINO has been loyal to its traditions, using (slaked) lime paste with a minimum ageing of 6 months and marble dust, with tiny quantities of synthesis resins (<5%) added so that it does not lose its mineral identity (93%). Nevertheless, it has good adhesion on unusual supports for this type of stucco and works well with modern construction materials: (plasterboard panels, gypsum products, perlite plaster and composite wood products such as chipboard).

SUGGESTED USES

Parietal decoration in hotels, offices, commercial premises, shopping centres, schools, nurseries, hospitals, and museums, providing fantastic properties such as:

- It provides a continuous lining.
- Fire-resistant (due to its mineral nature).
- Transpirable (permeable to molecules of water vapour).
- Due to its crystalline structure, it reflects light and heat radiation.
- Aseptic (high alkalinity of 12.5).
- Anti-static.
- Low allergenic levels.
- Ages very well: due to the action of the CO_2 it gets progressively harder.
- High resistance to rubbing/wear.
- Low thermal diffusivity.

- Its most simple finishing technique, smooth burnishing, fits well with most styles, i.e. it does not condition the decoration.

PHYSICAL LOCATION

Indoors / outdoors. Indoors, it can even be used in aggressive locations (bathrooms and kitchens) with the appropriate protection as described below. Although the stucco is very hard it is also absorbent as are many types of marble, which is why it requires treatment to avoid the penetration of substances that could affect its appearance.

TECHNICAL INFORMATION

PH 12.5 ± 0.5

DENSITY 1.8 ± 0.05 g/cm^3

VISCOSITY AS PACKAGED

Ready to use paste (always stir with an electric mixer before applying to make the product homogeneous).

SOLID CONTENT 76 %

PACKAGING 5-10 (standard) – 22 kg

SHELF LIFE

Approximately 16 months in stable environmental conditions (between +5 ºC (min) and +32 ºC (max) unopened. Keep away from freezing and high temperatures.

TECHNICAL APPLICATION DATA

FINISH

Matt or high satin finish, depending on the amount of polishing (pressing) of the finish layer with the trowel.

COLOUR

14 colours obtained from TONERS/TINTS added to the plain stucco (i.e. as presented in the container). It is also possible to use the 20 TONERS from the FINE MARMORINO range, but only if MEDIUM ROMAN MARMORINO is used indoors.
Special colours can be made for orders of over 800 kg.
For special colours for façades (differences in colour between batches are much more problematic than indoors due to the difficulty in finding clear divisions), calculate the performance of the material (kg/m^2) carefully in order to avoid the wall showing evidence of two different batches in which there are small differences in brightness and shade. If this occurs, it is best to choose a clear division to start using the other batch, and / or mix what is left of the first batch (do not use it up entirely) with the second batch.

DISSOLVENT Water (if water is added, dilute all of the containers by the same amount).

MAXIMUM THICKNESS PER LAYER 1.5 mm.

DRYING

48 h (20 ºC with a relative humidity of 65%).
Progressive hardening due to carbonation: after 30 days it is very hard.

PRIOR PREPARATION

The supports must be dry (the calculation for plaster and stucco is 1 day of drying per mm of thickness at 20ºC with a relative humidity of 65%) and free from impurities such as mildew, algae, lichen, environmental contamination (grease, soot, etc) and salt. Furthermore, it is necessary to adequately consolidate incohesive supports (gritty, dusty, crumbling).

APPLICATION TOOLS

Trowel and adequate protection equipment.

PROTECTION FOR MEDIUM ROMAN MARMORINO

In certain locations such as façades, bathrooms, corridors, etc, to avoid the penetration of dirt and other contaminants it is necessary to apply one of our numerous protective systems described below:

- PROTECTOR FOR STUCCOS AND MINERAL SUPPORTS.
- SILOXANE PROTECTION FOR MINERAL SUPPORTS 1/5.
- POLISHABLE WAX.
- ANTI-GRAFFITI WAX.
- SOAP WAX. This should be used indoors and away from direct exposure to water. It can be used to provide greater shine if necessary.

Consult the technical descriptions of each protection product in order to use them correctly. Study the application techniques and apply them to the appropriate material. If in doubt, consult our technical department.

INTERVAL BETWEEN LAYERS

Minimum time: 24 h (20 ºC with a relative humidity of 65%).
Maximum time: 72 h (20 ºC with a relative humidity of 65%).

APPLICATION CONDITIONS

Supports

- **Outdoors,** it can only be applied to mixed mortar renderings (preferably with industrially manufactured mortar to avoid dosing errors during application resulting in shrinkages and detachments). Take into account that mortars based on sand or Portland cement are prone to shrinking for at least 6 months.
- If the rendering is slightly gritty, first apply the PENETRATING PRIMER and, if there are noticeable differences in the trowelling or smoothing (to avoid irregular absorption), apply two coats of QUARTZ PRIMER.
- The presence of salts (sulphates, nitrates, chlorides…) in the support may result from the slow evaporation of water in the construction materials (adverse weather) or due to the continuous presence of moisture in the wall (rising damp, leaking pipes / drains and moisture of a capillary nature). The first cause is easy to remedy: the salts are washed away and an anti-salt treatment can be applied (optional) before applying our RICH QUARTZ PRIMER and MEDIUM ROMAN MARMORINO system. The second cause is a more

serious problem that cannot be solved by means of surface treatments, instead requiring the repair of the building. Therefore, if the causes are not resolved we do not recommend the use of our MEDIUM ROMAN MARMORINO stucco system.

- Indoors and outdoors, in areas where there is moisture due to condensation (though an unbroken thermal bridge), our RICH QUARTZ PRIMER and MEDIUM ROMAN MARMORINO system should not be applied.
- If the support has cracks / crevices, check whether they are dynamic or static in order to carry out the necessary treatment such as special elastic fillers or reinforcement of the stucco. If it is found that the cracks / crevices are unstable or dynamic as a result of structural problems it is best not to use MEDIUM ROMAN MARMORINO as a finish.
- Also examine the particular parts of the building that correspond to areas where there is an accumulation of stresses deriving from its construction that could cause the appearance of cracks in the lining such as structural dilatation joints, meeting points between different materials (brick and concrete, forgework, pillars, beams, window frame supports, blind boxes, etc.).
- When using indoors, it is possible to partially prevent cracking due to the aforementioned problems in both new and renovated buildings by gluing a glass fibre veil to the support and, when it has dried, applying a coat of QUARTZ PRIMER to the stucco. Outdoors, apply plasterwork reinforced with a 4 x 4 mm glass fibre veil. This only needs to be done if an anomaly is observed.
- Exposed sharp edges should be duly protected at termination points: flashing, places where the wall / frame meets the roof / tiles, etc.
- Moisture from inside, i.e. water that penetrates the stucco where it is attached to the support (negative pressure) can cause serious damage to the stucco.
- On **plasterboard panels**, **perlite plaster, and gypsum products** carefully clean the dust and generously apply one or two coats of QUARTZ PRIMER (if any deterioration of these supports is observed, apply PENETRATING PRIMER before the QUARTZ PRIMER).
- On **composite wood products** (medium density chipboard, fibreboard), apply MULTIUSE PRIMER before applying QUARTZ PRIMER in order to avoid stains from the redissolution of certain compounds that can appear with these materials.
- On indoor **painted supports**, carry out an adhesion and resistance test before applying QUARTZ PRIMER and then MEDIUM ROMAN MARMORINO, as the moisture of the material can make the paint peel off the support if it is not properly attached.
- Also indoors, when before applying the stucco it is necessary to polish or smooth popcorn texture, compounded paste or other textures; use an outdoor putty, as the strength of the stucco could cause less resistant putty to detach.

- On indoor ceramic supports and those that are well attached to the support, MEDIUM ROMAN MARMORINO can be applied following the application of a UNIVERSAL PUTTY plaster.
- The wall must be smooth and flat to avoid excessive use of material and cracking due to shrinkage caused by excessive thickness.
- **When working outdoors (façades),** whilst the stucco is being applied, direct exposure to water should be avoided so that the layer hardens properly and, if the layer is hard, to prevent "bleeding of colour" before the appropriate protection has been applied.

Working temperature of both the environment and the support (indoor-outdoor)

Minimum 7ºC and maximum 32 ºC (slightly moisten hot supports with water). Even if the temperature is above 7 ºC, in adverse weather conditions (sudden drop in temperature) do not apply the MARMORINO layer because at this temperature it takes a long time to expel the water contained within and it can freeze.

General observations

- When plastering bathrooms, there must be good ventilation for the wall to dry quickly and to avoid the fast proliferation of lichen and mildew.
- Observe veneer plaster carefully because sometimes small cracks originating in the wall are not detected and then these appear in the MEDIUM ROMAN MARMORINO, which is hard by nature.
- Before putting the self-adhesive stencil template in place for the creation of decorative motifs or other types of masking, let the stucco harden for 48 hours.
- Outdoors, it is necessary to apply the appropriate protection (described below) to prevent bleeding of bright colours due to contact with rainwater and rapid tarnishing in certain locations due to environmental pollution.
- If applied to special types of concrete or mortar, be careful with the additives contained and try to find out about these in order to make the right choice (release agents, anti-shrinking agents, anti-freeze, thinning agents, set accelerators, plasticizers, etc).
- If the façades and indoor areas have obvious problems (moisture of a capillary nature, moisture due to condensation, moisture due to filtration, movement of the support, etc...), do not apply this stucco before they have been resolved or the treatment has been applied to solve these problems.

- Depending on the way it is applied, as it is a handcrafted process, the final "pattern" may vary.

APPLICATION METHODS

Although there are various methods of application with very different finishes, below is a description of the technique using our range of colours.
Once the support is properly prepared as described above, the product is applied as follows:

1) Apply a first layer of MEDIUM ROMAN MARMORINO with a stainless steel trowel. **Leave to dry for 16-18 hours (20ºC and 65% relative humidity).**
2) Apply a second and third coat simultaneously (fresh on fresh), i.e. as the stucco sticks (dries) quickly, go back over approximately the last 1 m^2 applied with some fresh stucco to finish smoothing it.
3) When approximately 12-14 m^2 have been applied and the stucco has lost almost all of its moisture, go back to the beginning with a clean trowel to compact the grain and finish smoothing, with the help of a water spray gun (vaporiser, sulphate sprayer), lightly wetting the surface to be burnished if the stucco is too try.

1) 2) 2)

3) 3)

Application tips:

- In the case of façades with large surfaces, the work should be carried out with adequate teams (groups of people) in order to carry out the work without visible seams appearing. Carry out quartering if necessary to avoid these.
- When a wall is started, do not interrupt the section in order to avoid the appearance of visible seams.
- The amount of pressure that is applied when smoothing with the trowel determines the brightness of the colour.
- If the support is too warm it can be lightly wet with water, to avoid excessively fast absorption when the second layer is applied.
- If small bubbles appear (excess load), wait until the stucco is almost dry before smoothing. Do not force the area.

Here are some more examples of traditional and contemporary finishes:

PERFORMANCE

It is calculated in stuccos and mortars as 1.5 kg/mm/m^2 of thickness on smooth and flat surfaces, i.e. in the case of two layers of MEDIUM ROMAN MARMORINO with a thickness of 2.5-3 mm, the theoretical maximum performance is 3 kg/m^2.

If the wall/surface has pockets (surface defects), remove them or fill them in with putty (for outdoor use) before applying the product to avoid excessive use of stucco and cracking due to excessive thickness.

CLEANING OF TOOLS

This should be carried out with water and, if the material dries on the tool, it should be removed with sandpaper.

TECHNICAL DETAILS REGARDING THE MATERIAL APPLIED AND DRYING

HARDNESS 120 Shore C Units after 30 days.

RESISTANCE TO FLEXOTRACTION (UNE-EN 196-1: 1996)	1.5 N/mm^2 after 1 day. 3.5 N/mm^2 after 7 days. 4 N/mm^2 after 28 days.
RESISTANCE TO COMPRESSION (UNE-EN 196-1: 1996)	3 N/mm^2 after 1 day. 10 N/mm^2 after 7 days. 15 N/mm^2 after 28 days.
ADHESION	6.5 kg/cm^2

RESISTANCE TO ABRASION
Excellent, following a minimum hardening period of 30 days.

PERMEABILITY TO WATER VAPOUR

S_d = 0.35 m (KNUDSEN)

REFRACTION OF LIGHT (WHITE) 81%

EASE OF CLEANING excellent after 28 days, However, the material is absorbent which makes it necessary to apply protection to avoid the penetration of stains and dirt.

PRECAUTIONS alkaline material, protect eyes and skin.