

SECTOR

BUILDING

BIO BUILDING

CIVIL

FAT LIME CREAM AT 3 MONTHS

**OBTAINED WITH TRADITIONAL METHODS, WITH WOOD
COOKING AND TANK SEASONING**

Business consultancy restorer of B.C.
CLAUDIO MACRI ' CELL. 351.5959050

LEADER IN THE PRODUCTION OF THE TRADITIONAL FAT LIME CREAM OBTAINED IN ANCIENT AND ARTISANAL METHODS, WITH LONG WOOD FIRING AND SUBSEQUENT SEASONING AND CURING IN TANKS FOR THREE MONTHS. NATURAL BINDER AND TO COMPOSE COARSE MORTARS ON SITE.

Air lime is the oldest binder, already used by the Phoenix civilizations and to continue to this day. Its name derives mainly from the ability to set and harden in the air. It has no polluting effects on the environment, without being negative for housing health. It has been used in construction for millennia, it is natural, ecological, porous, transpiring, dehumidifying, thixotropic and with good adhesion to the walls, in the long term it does not form soluble salts or efflorescence or stagnation of water, resistance in harsh climates and climates marine, with excellent thermal insulation.

TRADITIONAL LIME GRASSELLO CREAM

WITH LONG WOOD COOKING

TANK AGING FOR THREE MONTHS

BINDER USED FOR THOUSAND YEARS IN THE SECTOR:

OF HISTORICAL - CIVIL - GREEN BUILDING

FOR INDOORS AND OUTDOORS (GP)

TRADITIONAL LIME PUTTY CREAM

CALCIUM LIMESTONE CL/90S PL - UNI EN 459-1

WITH (CAO+MGO) CONTENT OF 95.1%,

UNI EN 459-2

WITH A FREE CAO CONTENT OF 94.7%

UNI EN 459-2

FREE FROM IMPURITIES AND ADDITIVES OF ANY KIND

SPECIFICATIONS OF GRASSELLO CREAM

TRADITIONAL LIME FAT

State, wet in 25 kg bag

State of aggregation, homogeneous buttery paste

Product of alkaline nature, excellent resistance over time and to mold formation.

Hardening: calcium hydroxide, reacts with carbon dioxide

of the air giving the typical reaction of aerial binders with formation of calcium carbonate.

Our traditional lime slaked cream is a binder, which can be used to prepare compounds fluid and workable, it has the property of passing into the state solid, with good amalgam viscosity in retaining the sands mixed, and strength to unite tenaciously in joints and veins building materials.

HISTORY OF MARSEGLIA CALCE SRL

Marseglia lime began its activity much earlier than the years 50, the Progenitor was Antonio Marseglia who, by virtue of his work experience acquired from a young age, he started out in a way Artisan his own business, cooking the limestone in the so-called hand kilns, i.e. heaps of stones arranged in a spiral with ring growth and rounded system. At the base of heap the fagots were inserted and, in order not to disperse the heat inside the stack, it was covered with earth from the top to descend across the surface. Such was the method used since antiquity. The precious oxide obtained from cooking of pure limestone, was sold in the Province of Brindisi and part of the Puglia Region. In the 60s by virtue of continuous growth Professional, made up of a great consensus of oxide requests, Antonio proceeded and started the new Industrial Site "Tino Villanova" and here the entrepreneurial development with the furnaces began for wood firing of limestone. In the 70s, with the building growth and the continuous requests of customers for the product finished, Antonio begins the production of slaked lime, building huge vats for maturing. In the 90s Marseille

Antonio, continuing in the prestigious growth of the clientele, obtained for the quality and care of the finished product, and renews its own innovative plant still in Tino di Villanova. Over 2,000 years the children take over, and Marseglia Calce Srl is born, continuing in the footsteps indicated by the Father, keeping all those methodologies handed down and acquired by the children in the daily work, from the production of wood cooking to the cure of the maturation in the tank, to continue producing after 72 years the excellent slaked lime of the past.

One of our strengths of our company consists in offering a consultancy service (carried out by professionals and technicians in the Historic Building Sector), capable of analyzing materials pre-existing ones and in recommending the right maturing of the cream of lime putty and the aggregates needed for the mortars to realize.

PRODUCT SPECIFICATIONS AT 3 MONTHS

Marseglia Calce Srl "perhaps" is one of the very few companies which still produces in the Ancient and Artisan methods, the cream of traditional lime putty, obtained with the methods and the commitment of the past, in the choice of our pure stones Apulian calcareous, gradually cooked in wood at low temperature for a good 14/15 days, in the ancient vertical flame oven indirectly, to obtain a valuable homogeneous oxide of reactive calcium, and once placed in plenty of water for its extinction, the dense milk of lime is obtained "the hydroxide of calcium", at the end it is decanted into the tanks for its maturation, which is 91 days, necessary for the product to use it, as a binder for preparing traditional coarse mortars on site, mortars for leveling walls, for modeling shapes of base with important thicknesses, grouting, plinths, mortars for base plasters (arriccio - rendering), mortars for plasters a cocchiopesto, mortars for dehumidifying plasters, etc.

It has a medium-fine granular structure of white color San Giovanni, dense, buttery and homogeneous, with an excellent viscosity and creaminess in its almost greasy softness, valid for its plastic, adhesive, thixotropic, antibacterial characteristics therefore suitable for applications in the building sector Historical - Green building - Civil.

In fact, by combining our cream with lime fat putty traditional, aggregates and sands of various particle sizes are obtained

valid historical mortars, both for holding the amalgam in phase application both for the good adhesion to the masonry and for the smoothness of the final draft.

The addition of water in the mortars prepared with our binder should be avoided, since in its mass our binder has the necessary percentage of free lime water to give the mortar the right workability and plasticity e respect the mechanical strengths, it is advisable to wet a I refuse the masonry, even the night before.

Due to the strong sealing viscosity of the blended aggregates, it contains some the loss of mortar by falling to the ground. Thus composed mortar achieves excellent application results.

The Natural Cream of traditional lime fat is used for millennia, once applied it gives guarantees of not forming in the long run harmful by-products of soluble salts (e.g. magnesium sulphates), not to generate water retention or efflorescence.

Our traditional lime slaked cream is a Natural Ecological binder, having good adhesion to masonry, in fact, with its Porous, Breathable, Dehumidifying qualities, Antifreeze, Antibacterial, these are the characteristics that allow the moisture to evaporate easily from the mortar ascent, which takes place by suction by the binder with the subsequent one elimination by osmosis, creating a uniform control of humidity in the masonry, with good thermal insulation. Excellent resistance in cold climates (since it does not freeze) and in marine climates (it does not form saline efflorescence).

It has no polluting effects on the environment, without being negative for home health.

There is no need to add cements or resins in the mixing phase to obtain its natural hardening.

Good reversibility (according to the restoration charter.)

HISTORICAL BUILDING SECTOR

GREEN BUILDING - CIVIL:

Binder, traditional seasoned lime putty cream

at three months; Absolutely Natural and Ecological, compatible with ancient masonry, for brick masonry, mixed to stones and bricks in general.

DO NOT APPLY:

On chalky, inconsistent, degraded floury, greasy or greasy substrates silty or with synthetic paints or films, on reinforced concrete;

Protect surfaces from bad weather and pouring rain from strong solar radiation, do not apply on cold and harsh days.

SURFACE PREPARATION:

Picking of stiff and inconsistent mortars, brushing and washing of the surfaces to give adhesion to the new mortar, elimination of extraneous and biological presences; The surfaces they must be clean and thoroughly wet, even in the evening before and before work.

USE:

To make traditional thick mortars for rincocciature and masonry leveling, for base plasters (arriccio - rough coat) for cocciopesto plasters, dehumidifying plasters - plinths perimeters, thick grouting, to model basic shapes with important thicknesses etc...

MIXING APPLICATION:

Mix in rotary mixers, adjustable mills, and/or mixer

electric, or manually until a dough is obtained

homogeneous;

It is not recommended to add water in the dough (because the product

has in its mass the natural retention of lime water),

for any work needs at the discretion add one

minimum amount of water in the dough;

To be applied with a trowel and trowel made of metal or wood

sponge, to obtain the desired finish.

TO MAKE HISTORICAL MORTARS:

To make thick mortars, slaked lime is mixed with aggregates and various silica sands, granite, quartz, marble, carbonate,

travertine, cocchiopesto, etc. (igneous - sedimentary aggregates

- metamorphic), always washed and sieved, without the presence

of clayey, biological elements and various selected impurities

in the right quantities of the particle size scales;

In the preparation of traditional lime-based mortars

aerial, the ancient rules performed by the Masters always apply

Artisans, eventually the water should be added gradually to the dough

continuing to stir the mixture.

AIR MORTARS

CLASSIC EXAMPLES OF QUANTITIES TO PACK IN

BUILDING AERIAL MORTARS SITE

In proportions:

10 kg of binder aged for 3 months;

30 kg of premixed aggregates and sands of various granulometry:

The granulometry varies from 6/5 mm < > 0.300 mm;

In the granulometric scale of coarse 10% - medium coarse 30%

- average 50% final 10%;

Any mixing water from 0.5% to 0.8% according to the period

and temperatures of the mortar packaging.

FOR NEEDS OF WORKS ON SITE OF AERIAL MORTARS

BIG WEAKLY FAT

11 kg of binder aged for 3 months;

30 KG premixed aggregates and sands of various granulometry;

The granulometry varies from 7/6 mm <> 0.400 mm;

In the granulometric scale of large 15% - medium-large and

70% - end 15%;

Mixing water from 0.5% to 0.8% according to the period and temperatures

of the packing of the mortar.

MORTAR FOR COCCIOPESTO PLASTER

Kg 10,500 grams of binder matured at 3 months;

20 kg of cocchiopesto in the desired colour;

10 kg of white quartz silica sand;

Cocchiopesto: with variable particle size ranging from 4/3 mm <>

0.100mm;

White quartz silica sands; with variable granulometry that

varies from 3 mm <> 0.300 mm;

In the granulometric scale of large 10% - medium/large 30% -medium/fine 50% - filler 10%.

Mixing water the percentage of water to be mixed varies from

12% to 14%, if an earthenware and dry sand is used.

If you use earthenware and damp sand, the percentage

of water varies from 4% to 6% of the total mortar, the percentage

varies according to the period and temperatures of the packaging

of the mortar.

The final coloring will be obtained by coloring the **cocciopesto** used in its shades from yellow to red.

AIR MORTARS MADE HYDRAULIC:

Our air lime can be made hydraulic and employed in humid or submerged environments, to carry out **rincocciature work** and wall leveling, for base plasters (**arriccio**

- rough coat) for **cocciopesto** plasters, dehumidifying plasters

- perimeter plinths, thick grouting, for modelling

basic shapes with important thicknesses, etc...

Adding at the time of making the dough some

mortars (binder + siliceous aggregates) fine aggregates of reactive products of

silica/alumina oxide etc. which are the sands originated from

volcanic eruptions such as **pozzolana**, **azole**, **lapilli**, **trass**, while

cocciopesto and **kaolin** (derived from cooking clay)

they are strongly hydraulic (aluminum silicate) and compatible

by affinity to our traditional binder, calcium hydroxide.

It is made up on site with this very simple mixture

the ancient Roman **cementum**, a totally natural hydraulic binder

and Ecological, without impurities or industrial additives.

The robustness of this excellent hydraulic mortar is proven

over time, and its resistance can be observed in the **Monuments**

Built by the Romans, still in a perfect state of conservation,

both if located in rigid climates and in marine climates.

Hydraulic aerial mortars have excellent mechanical resistance,

preserving the typical plasticity, workability and elasticity

of aerial kicks. The pozzolanic reaction favors the

joints between binder and sand, keeping the mortar porous with the

breathability and antifreeze typical of air lime, these properties

allow moisture to evaporate easily from mortars.

Retains properties in flexibility and resistance under stress,
with little tendency to form efflorescence, nor to give shape
of soluble salts, nor to the formation of molds and bacteria, with excellent waterproofing.

Hydraulic aerial mortars are recommended for Restoration and
Recovery of Historic Artistic Buildings, as they are more "soft
and Ecological" of cements and other industrial hydraulic binders.

It is a natural and ecological binder, it has no polluting effects
on the environment, without being harmful to housing health, used
always used to make historic hydraulic mortars

Traditional.

Long-term properties of air lime hydraulic mixtures
maintain their plastic properties over time, with good suction
masonry, greater yield and mechanical resistance, durability
in the long term in very humid or submerged environments, very high
resistance to sulphate aggression, and with excellent resistance to
frost and decay.

They are used in all sectors for their ease of packaging
and workability of the mortars, for the precious and harmonious appearance
that the surfaces obtain, and which make it a valid product
always used.

CLASSIC EXAMPLES OF QUANTITIES TO PACK IN

WORK SITE FOR HYDRAULIC COARSE MORTARS:

MORTINA FOR PULL-ON AND ATTACHMENT WITH AGGREGATES

PYROCLASTICS;

10 kg of traditional seasoned lime putty cream

at 3 months;

13 Kg of pyroclastic sands grain size scale from 1 mm <>

0.100mm;

15 kg of quartziferous silica sand 3/2 mm <> 0.200 mm;

In the granulometric scale of large 10% - medium/large 30%

- medium/fine 50% - filler 10%;

Mixing water, the percentage of water on the total mix

goes from 3% to 4% the percentage varies according to the period and temperatures

of the packing of the mortar.

N.B. If cocchiopesto is used instead of materials

pyroclastic, in the same quantities, the percentage of water is del

9% 11%.

STANDARD COARSE HYDRAULIC MORTAR

WITH COCCIOPESTO SANDS;

10 kg of traditional seasoned lime putty cream

at 3 months;

Approximately 16.400 kg to 18.400 grams of dehumidifying mortar are needed

to achieve a thickness of 1 cm per square metre.

We provide advice and indications of the materials to be purchased

and to mix.

In hot and muggy periods it is advisable to mix in the dough

of the mortar, an optimal amount of basic cellulose from 2% < >

5% (depending on its quality, the percentage may vary). Cellulose

basic has the property of conserving water once wet

and gradually return it to the mortar to adjust the right one

internal humidity in the setting and hardening phase, avoiding its

dehydration and loss of binder strength. Wishing yes

they can also use clay, cocchiopesto, natural hemp fiber,

flax fiber, straw, etc. 15 kg of cocchiopesto sand with a granulometric scale of 1

mm <> 0.100mm;

15 kg of quartziferous silica sand 6/5 mm <> 0.400 mm;

In the granulometric scale of large 10% - medium/large 30%

- medium/fine 50% - filler 10%;

Mixing water, the percentage of water to be mixed in the mix varies from 11% to 12%, the percentage varies according to the period

and temperatures of the mortar packaging. N.B. If he works

pyroclastic materials to replace cocchiopesto,

in the same quantities, the percentage of water is 6% 7%.

STANDARD BREATHABLE MORTAR

ANTIFREEZE DEHUMIDIFIER:

Kg 11 cream of lime putty traditional seasoning

at 3 months;

Kg 10 parts of quartz silica sand;

Kg 11 parts of mixed materials of pozzolana, zeolite, pumice;

12 kg of cocchiopesto;

Quartz silica sands with a granulometric scale ranging from 5

mm <> 4mm;

Variable scale pyroclastic sands ranging from 3 mm <>

0.100mm;

Cocchiopesto with variable particle size ranging from 5/4 mm <

> 0.200mm;

In the granulometric scale of large 10% - medium/large 30%

- medium/fine 50% - filler 10%;

The percentage of water: to be mixed in the dough varies from 11%

13% if the cocchiopesto and the pozzolans and the sands are dry;

The percentage of water: to be mixed in the dough varies from 3%

4% if the cocchiopesto and the pozzolans and the sands are damp;

The percentage of water varies according to the period and temperatures of the packing of the mortar.

The minimum recommended thicknesses of the dehumidifying plaster, are the minimum thicknesses from 4/3 cm per square meter, to obtain valid dehumidifying systems used for millennia in the built world;

Approximately 16.400 kg to 18.400 grams of dehumidifying mortar are needed to achieve a thickness of 1 cm per square metre.

We provide advice and indications of the materials to be purchased and to mix.

In hot and muggy periods it is advisable to mix in the dough of the mortar, an optimal amount of basic cellulose from 2% < > 5% (depending on its quality, the percentage may vary). Cellulose basic has the property of conserving water once wet and gradually return it to the mortar to adjust the right one internal humidity in the setting and hardening phase, avoiding its dehydration and loss of binder strength. Wishing yes they can also use clay, cocchiopesto, natural hemp fiber, flax fiber, straw, etc.

Thanks to the qualities of our binder, mortars can be made also using larger granules up to 9 mm < > 0.400 mm;

For each layer, do not exceed 1 cm in thickness;

For higher thicknesses, spread the mortar in several passes, spaced out by a time that varies from 12 hours to 24 hours from each other, depending on the season and temperature;

The time of use of the dough varies from half an hour to less than 1 hour (for hydraulic mortars) to 2/4 hours (aerial mortars) in consideration the period and the temperature;

Operating temperature: ambient +5 / +35 °C;

The mortar, after being applied in the desired thickness, must be kept moist (according to the periods and the ambient temperatures) for the time necessary for it to set e surface hardening (recommended from 12 hours to 24 hours)

Our traditional lime slaked cream is taken as it is from the storage tank and stuffed without adding water;

Our traditional lime slaked cream goes used and mixed as is as supplied by the Manufacturing Company;

The cream of lime fat from the Marseglia Company Srl, once applied, it will maintain its quality and durability over time and the sealing of the incorporated granules.

THEORETICAL CONSUMPTION PER SQM OF MALTA

AIR OR HYDRAULIC:

Consumption: varies from the thicknesses to be achieved, with the quantity of Kg 25/27 traditional lime putty cream combined with 75/81 kg of aggregates mixed with various particle sizes, base plasters are made for 6/5 square meters with thicknesses of 1 cm to 0.80 mm per square meter, in correspondence with the largest granule in the granulometric curve used and in compliance with the funds and the underlying surfaces;

To carry out works: perimeter wainscoting, grouting thick, rincocciature and masonry leveling, to model shapes base with important thicknesses, etc... the quantities vary according to the thicknesses and surfaces to be treated and to be brought to level.

TEST RESULTS

Determination of chemical requirements (UNI EN 459-2)

| TEST DESCRIPTION | | Unit of measure | RESULT |
|-------------------------|--------------|-----------------|--------|
| CaO + MgO content | UNI EN 459-2 | % | 95,1 |
| MgO content | UNI EN 459-2 | % | 0,3 |
| SO ³ content | UNI EN 459-2 | % | 0,1 |
| CO ² content | UNI EN 459-2 | % | 3,0 |
| CaO content free | UNI EN 459-2 | % | 94,7 |

Determination of stability (UNI EN 459-2)

Stability test result:

- The slaked lime specimens did not show expansion cracks and consequently passed the test.

FOTO

Before the treatment

FOTO

After the treatment

| Test description | Unit of measure | Result |
|---|-----------------|--------|
| pH value | % | 12.0 |
| Calcium carbonate content (Calcimetry with Dietrich-Frühling calcimeter) | % | 0.09 |

GRANULOMETRIC DISTRIBUTION (UNI EN 459-2)

| Sieve mesh opening (mm) | Unit of measurement | Residue | Passing |
|-------------------------|---------------------|---------|---------|
| 0,200 | % | 0,0 | 100,0 |
| 0,090 | % | 0,1 | 99,9 |

DETERMINATION OF WATER VAPOR PERMEABILITY (UNI EN 1015-19)

| Performance | Symbol | U.M. | Sample | | |
|--|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | | A | B | C |
| Flow | $\Delta G/\Delta t$ | [kg/s] | 4,15 - 10 ⁻⁰⁸ | 3,83 - 10 ⁻⁰⁸ | 3,81 - 10 ⁻⁰⁸ |
| Permeance at water vapor | Λ | [kg/m ² s Pa] | 2,23 - 10 ⁻⁰⁹ | 2,04 - 10 ⁻⁰⁹ | 2,04 - 10 ⁻⁰⁹ |
| Vapor permeability coefficient (μ) | | | 5,8 | 6,4 | 6,3 |
| AVERAGE vapor permeability coefficient (μ) | | | | 6,2 | |

CERTIFICATIONS EU 305/2011

STATEMENT IN PRODUCTION

AND MCPF AGING CERTIFICATE:

Production certifications: it starts with wood cooking pure limestone, obtained at a low temperature (about 840-860°C), quenching of the oxide obtained, subsequent seasoning in tank for obtaining the pure lime putty cream fat completely extinguished with a high content of calcium hydrate, period of the months concerning the maturation in the tank.

The Data of the various processes: must be transcribed in the Document marked, "European Standard, Certified in the Manual on Production Control in the MCPF Factory "della Marseglia lime Srl. Drawn up in the Standard of the New European Regulation EU No. 305/2011. Report the date of cooking, the date of the next shutdown, the Date of the beginning of the seasoning, with reference of the tank and months of maturation, including the analyses of the laboratory of the cream of processed lime putty, indications of the quality and strength of the binder. (documents filed in archive)

ITEMS OF THE SPECIFICATION OF THE PRICE LISTS

REGIONAL CULTURAL HERITAGE

The lime putty is included and used as a binder in the specifications of the items in the Specifications of the Regional Assets Cultural and other public treasures, to make traditional mortars based on aerial or hydraulic limes, for Recovery works in Historic Monumental Building sector OG/2 and for interventions of Conservative Restoration in Category OS/2A – OS/25.

PACKAGING: 3 MONTHS

Shipping by Pallet; of 10 bags of 25 kg each.

Shipping by Pallet; of 20 bags of 25 kg each.

Shipping in Pallet; from 40 bags of 25 Kg each.

Order code: GCS/M3

STORAGE:

If you store bags indoors or covered, place them on top footrests and without drilling its polyethylene casing and repaired by strong changes in temperature, the product will remain intact inside for over 24 months, improving its characteristics in the mixing and drafting stage.

HANDLING

Hazards identification

The substance is corrosive to the eyes.

Repeated or prolonged skin contact may cause dermatitis.

The preparation is a medium strong base which reacts with acids.

INDIVIDUAL PROTECTIONS:

Coverall body protection in non-woven fabric

Hand protection: rubber or latex gloves

Face protection: goggles

Respiratory protection: dust masks

Foot protection: safety shoes

FIRST AID MEASURES:

Skin contact.

Rinse the skin with plenty of water or with a shower.

Eye contact.

**Wash with a non-pressure water jet for at least five
minutes.**

If you wear contact lenses, remove them immediately.

If necessary, transport the victim to hospital.

DISPOSAL:

**The bags and the material must be disposed of in accordance with current regulations, it can pollute
and change the PH of the soil or watercourses.**

PRODUCT STANDARDS:

**The regulations that certify the lime putty used as
aerial and/or hydraulic limes for construction in the Works sector
Public, they must comply with the UNI EN 459-1 Standard Marked
CE and to follow in the Declaration of Conformity Document D.
or. P. CPR (EU) N° 305/2011, and as understood in the circular N°
1767 with law 21/06/1964 N°463, and as currently decreed
the Standard of the UNI 11488/2021 Regulation on Cultural Heritage
to prepare Traditional Historic mortars on site.**

**And as the standard from the European Directive CE EN 998-1 cites:
2016 (GP) binder, used for packing generic mortars
for indoors and outdoors. Quicklime analysis data
in clods (from which seasoned lime fat is obtained)
included in this site, by Marseglia lime Srl, are certified
as calcium limestone CL/90S PL UNI EN 459-1 (GP) (CR) with a**

free CaO content at 94.7% UNI EN 459-2 and with content total of (CaO+MgO) at 95.1%, UNI EN 459-2, with Marking CE, D.o.P certified and approved with CPR (EU) No. 305/2011 in certificate of conformity on the quality of factory production MCP extension.

Our traditional lime putty cream production

it is still made in the Ancient and Artisan methods. There

Limestone is fired in an ancient vertical draft kiln

natural, with a continuous cycle of wood-fired cooking and subsequent cooking tank seasoning.

The raw material used to obtain our cream of

traditional lime putty, are our crystallines

Apulian limestone (with a high content of calcium carbonate >

95.1%) intentionally split to various sizes from large

medium to small and inserted into the cooking chamber so as to form

of the spaces between the stones in which the warm humid air can pass

produced in the combustion zone, once purified from

ashes. It is conveyed by the cooking system for thermal rise

of the heat in a completely Natural way (chimney effect) spreading

between the voids of the limestone stones, gradually heating them

up to the calcination temperatures of the limestone of

860°C.

The cooking chamber is separated from the combustion area

of the shaft furnace, the two chambers communicate with each other via

outlets of the fireplace connected to the cooking area, called altars.

The combustion chamber, to develop color, use as

propellants untreated faggots and lagne (without various presences o

contaminating paints). The ashes are recovered and disposed of

from the four mouths placed at the base of the vertical shaft kiln.

Firing of crystalline limestones (calcium carbonate)

begins with the insertion in the raised part of the oven (funnel),

for the first important limestone drying phase,

remaining for a long time and with low temperatures that vary

from about 80°/120°C, then by natural descent they enter the

upper part of the cooking chamber, where they remain for a long time

time for the second drying phase with increasing temperatures

ranging from about 140°/250° C.

This method of gentle drying of limestone is carried out

for several days it has been used for millennia, feasible only with these Ancients

shaft furnaces with continuous cooking cycle with natural draft,

serves to prepare and avoid limescale in the subsequent stages of

rising temperatures to undergo sudden thermal shocks, setting them on fire

abruptly the limestones and causing them to fast

water loss. In addition, our Ancient shaft oven with the

its combustion chamber separation system

cooking chamber, avoid placing the flames in direct contact

with the material to be fired, inevitably altering it, prejudicing it

the quality and purity of the limestone, as well as the whiteness,

also for lift ash.

This ancient phase of limestone preparation will deliver us to

after firing a clean, porous, brittle, reactive fine oxide

of lime, with very reactive single grains in the hydration phase.

(While in modern forced ventilation ovens, gas fueled

or other fuel, the resulting calcium oxide is cooked with

temperatures ranging from 1150°C to 1300°C (fired lime a

death), moreover the stones introduced are of small size, which

coming into contact with the flame drawn in and directed mechanically

inside the material firing chamber

calcareous, which by overheating causes its

rapid loss of water, the calcium oxide obtained from it will have,

the higher the cooking, the greater the amount of grains

large compact and adherent to each other, therefore not very porous and with

lower capacity for reactivity in hydration in the quenching phase.)

Once dry, the limestone is ready to enter the

intermediate part of the cooking chamber with temperatures ranging from approximately 300/400°C, remains in this area for the period

necessary. Later they arrive in the central part of the chamber

of cooking, reaching the optimal temperature on 500/600

Approximately C°, at this temperature the calcium carbonate begins to dissociate

gradually into calcium oxide and release carbon dioxide.

Eventually they reach the end of the oven for cooking

final, gradually reaching the optimal temperature

around 840/860°C. This cooking phase varies from 10 to 12

hours, to complete the transformation of the calcium carbonate

CaCO₃ into calcium oxide CaO, this reaction occurs by decomposition

thermal of the limestone (endothermic reaction) producing

a pure homogeneous, porous, reactive calcium oxide

CaO releasing carbon dioxide CO₂

In the reaction $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$.

For the purity of our calcium oxide (CaO) > 95.1%, we obtain

an excellent traditional calcitic lime.

At the end of cooking, the CaO live clods are reduced from their initial weight

by 40% (also causes the loss of carbon C and oxygen atoms

O) and the living clods take on a very crumbly consistency

porous. In addition the gray color variations of the limestone are lost and the stones become mostly white. The complete cycle cooking takes place in 14/15 days, depending on weather conditions external (presence of wind energy), climatic factor which accentuates the chimney effect of the cooking system of the a natural draft.

Once obtained an excellent homogeneous calcium oxide traditional basic, is immersed in plenty of water, and for the strong reactive basic reaction (natural exothermic) leads into boiling the live clods and is releasing a violent heat and the consequence disintegration into a pulp of the cooked stones (clods lives) due to the expansive effect of the transformation from calcium oxide CaO to calcium hydroxide Ca(OH)₂

In the reaction $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$.

In this extinguishing phase, the lime oxide dissolves in slaked lime, lime hydroxide, Ca(OH)₂ forming single porous macro - prismatic crystals (portlandite). Thick Milk of Lime Ca(OH)₂ obtained is immersed in the maturation tanks, for i months required for its use.

Lime hydroxide crystals Ca(OH)₂ in the ripening phase day 3 months, they undergo morphological and scaling changes with the formation of single porous micro - tubular crystals / hexagonal (portlandite).

With this ancient method, a slaked cream is obtained traditional 91 day fat lime, which is thick, creamy, thixotropic viscous and slightly greasy, improving in plasticity, processability and water retention with properties natural in Porosity, Breathability, Dehumidifying, Antibacterial,

Antifreeze.

The carbonation of lime putty cream

**(setting and hardening reaction) of calcium hydroxide, takes place
in the following reaction thus composed from a formal point of view.**



**Returning to the initial state of calcium carbonate CaCO₃ with
the loss of water H₂O.**

**Thus it is a natural and ecological binder, it has no polluting effects
on the environment, without being harmful to housing health,
without giving shape over time to caustic soluble salts or efflorescence
nor water retention.**

BINDER USED TO MAKE HISTORICAL MORTARS