

**SECTOR**

**CONSERVATIVE RESTORATION**

**HISTORICAL**

**ARTISTIC RECOVERY**

**MONUMENTAL**

**ARCHAEOLOGICAL**

**GREEN BUILDING**

# **LIME FAT CREAM AT 10 MONTHS**

**OBTAINED IN TRADITIONAL METHODS, WITH WOOD COOKING AND AGING IN  
THE TANK**

**SECTOR**

**CONSERVATIVE RESTORATION**

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**GREEN BUILDING**

**BUSINESS CONSULTANCY**

**RESTORER OF B.C. CLAUDIO MACRÌ CELL. 351.5959050**

**LEADER IN THE PRODUCTION OF THE TRADITIONAL LIME GRASSELLO CREAM OBTAINED IN THE ANCIENT AND ARTISAN METHODS, WITH LONG WOOD COOKING AND SUBSEQUENT SEASONING AND CARE IN TANK FOR SIX MONTHS. NATURAL BINDER FOR MAKING MORTARS FOR PLASTERS AND PLASTERS AND DECORATIONS ORNAMENTALS OF DECORATED SURFACES.**

**Air lime is the oldest binder, already used by the Phoenician civilizations and continuing up to the present day. His name derives mainly from the ability to set and harden in the air. It has no polluting effects on the environment, without be negative for housing health. It has been used in construction for thousands of years, it appears to be Natural, Ecological, Porous, Breathable, dehumidifying, thixotropic and with good adhesion to masonry, does not form soluble salts over time neither efflorescence nor water retention, resistance in harsh climates and in marine climates with excellent thermal insulation.**

**TRADITIONAL LIME PUTTY CREAM WITH LONG SWEET COOKING WITH WOOD AND WITH AGING IN THE TANK FOR 10 MONTHS**

**HISTORICAL-ARTISTIC CONSERVATIVE RESTORATION SECTOR, MONUMENTAL RECOVERY - ARCHAEOLOGICAL - GREEN BUILDING.**

**INTERNAL EXTERIOR (GP) (CR) TRADITIONAL LIME GRASSELLO CREAM**

**CALCIUM LIMESTONE CL/90SPL / UNI EN 459-1**

**WITH (CAO+MGO) CONTENT OF 90.80%, UNI EN 459- 2**

**CaO CONTENT OF 87.90% UNI EN 459-2**

**FREE FROM IMPURITIES AND ADDITIVES OF ANY KIND.**

## **SPECIFICATIONS OF GRASSELLO CREAM**

### **TRADITIONAL LIME FAT**

**Status: wet in 19 L bucket**

**state of aggregation; very dense and full-bodied mass.**

**Product of alkaline nature, resistant to time and formation of moulds. Hardening calcium hydroxide, reacts with the anhydride carbon of the air, giving the typical reaction of aerial binders with formation of calcium carbonate.**

### **HISTORY OF MARSEGLIA CALCE SRL**

**The lime marseglia began its activity much earlier than the years 50, the Progenitor was Antonio Marseglia, by virtue of his experiences work acquired from a young age in other professions, began his own craft in his possessions activity, cooking the limestone in the so-called kilns by hand, i.e. heaps of stones arranged in a spiral with growth**

ring and rounded system. At the base of the mound they came insert the kindling and, in order not to disperse the heat inside the stack, it was covered with earth from the top downwards for the whole surface. This was the method used since ancient times.

The precious calcium oxide obtained from the cooking of the pure limestone, was sold in the Province of Brindisi and part of the Region Puglia.

In the 60s by virtue of continuous professional growth, made of great consensus of requests for calcium oxide, Antonio proceeded and launched and renovate the new Industrial Site "Tino

Villanova" from this period the entrepreneurial development began, building the kiln "currently still in use for production" for soft wood-fired cooking of limestone, this type oven and the one that has always been used over the millennia to cook in optimally limestone, is a vertical shaft furnace with natural draft in a continuous cycle of gentle wood cooking, every cooking varies from 14/15 days, to obtain a fine homogeneous calcium oxide, which is obtained when immersed in abundant water the precious traditional lime putty cream.

In the 70s, with the building growth and the continuous requests of the customers of the finished product, Antonio begins the production of traditional lime putty cream, building huge vats for maturing. In the 90s Marseglia Antonio, continuing in the prestigious growth of the clientele, obtained for the quality and care of the finished product, renewing and expanding its innovative plant always in Tino di Villanova.

In the 2000s his sons took over, and Marseglia was born Calce Srl, continuing in the footsteps indicated by the Father, maintaining all those methodologies acquired and handed down from Grandpa to Father and passed on to the children in the working day, in production of wood cooking up to the curing of the seasoning in tub, to continue after 72 years to produce the excellent cream of once-old lime putty.

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 and recommending slaked lime and the necessary aggregates to the mortars - maltine - plain to be made.

## **PRODUCT SPECIFICATIONS AT 10 MONTHS**

Marseglia Calce Srl "perhaps" is one of the very few companies which still produces in the ancient and artisanal 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 the 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 a good 304 days, which are necessary for the product for the its use, as a binder to prepare mortars on site, malts, traditional amalgams both white and colored to use in the finishing of decorated surfaces in the restoration sector historical-artistic conservation and monumental recovery

**– Archaeological – Green building for reintegration mortars, for intonachini, marmorini, fake marbles, amalgams to compose decorated surface ornaments, for whitewash, wall paintings and even more.**

**It is presented for its long maturation with a paste extra-fine granulometry of San Giovanni white colour, excellent the consistent in density and body, remaining in its at the same time buttery and homogeneous, with an excellent naturalness viscosity and creaminess in its softness, almost greasy.**

**Its characteristics are excellent in plasticity, adhesiveness, thixotropic, for these properties it is suitable for the various processes and quality aesthetic finishes. Indeed, by combining with our cream of traditional lime putty sands in various grain sizes from medium-fine to filler, excellent amalgams are achieved both for workability, fluidity, adhesion and final leveling, making easy and flowing processes in conservative Restoration and Recovery Monumental, where finishes of great value are required Artistic; The greatest density of our binder at 10 months has**

**the property of retaining the mixed aggregates without producing shelling nor cause tears of union and adherence in the overlapping phases in the drafts, giving it the seal to the smoothness**

**in the finishing of the decorations of the thick ornaments, of the flat surfaces, or to fill irregularities of deficiencies more or less extensive, thus avoiding the loss of malt for falling to the ground or dirtying the underlying surfaces. The mortar composed in this way it achieves excellent application results, where it is a precious aesthetic finish is required;**

**Our binder is suitable for its right degree of alkalinity to be colored on site with earths or natural pigments, obtaining a traditional colored lime slaked cream.**

**The addition of water in mortars and grouts made with our binder should be avoided, since in its mass naturally possesses the percentage of free lime water, necessary to give the malts the right workability and plasticity and respect the mechanical strengths;**

**Cream of seasoned lime putty, once applied gives guarantees of not generating water retention or efflorescence and not form harmful by-products in the long time of soluble salts (e.g. magnesium sulphates) which they would form cottony saltpetre, these are consequences, which generate bleaching superficial and which would frustrate the restoration work**

**conservatively performed.**

**The use of traditional lime putty cream, where used, will preserve the restoration work carried out over the long term, to demonstrate this if you look at the decorated surfaces or the intonachini made in the past centuries, are still in perfect condition state of conservation;**

**Our traditional slaked lime cream is a binder Natural Ecological, in fact, with its Porous, Breathable, Dehumidifying, antifreeze, antibacterial, characteristics that allow the applied mortars to evaporate easily the underlying humidity, which occurs by suction by the binder with the subsequent elimination by osmosis of the water, creating a uniform control of the humidity of the underlying parts, with good thermal insulation;**

**The intonachini and decorations performed where applied have excellent resistances;**

**Both in cold climates (since it does not freeze)**

**Both in marine climates (it does not form saline efflorescences).;**

**It is a natural and ecological binder, it has no polluting effects on the environment, without being harmful to housing 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 paper).**

**SECTOR: CONSERVATIVE RESTORATION**

**HISTORICAL - ARTISTIC AND RECOVERY**

**MONUMENTAL - ARCHAEOLOGICAL**

**GREEN BUILDING**

**Binder, traditional seasoned lime putty cream at 10 months, suitable for making mortars, malts, amalgams historic traditional to make or recover intonachini both white and coloured, for Conservative Restoration of frescoes or wall paintings, both smooth and relief decorative ornaments, frames, jambs, friezes, additions of stucco amalgams, murmur or imitation marble, smooth and/or relief mouldings, grouting of finishes, glazes, colored drabs, wall painting**

**and more. Absolutely Natural and Ecological, compatible with the ancient structures.**

**DO NOT APPLY:**

**On plaster supports, inconsistent, chalky, degraded, greasy or silty or with paints or synthetic 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:**

**Flat masonry surfaces, removal of rough and inconsistent parts, subsequent brushing with final washing;**

**Decorated areas, removal of aged and inconsistent parts, subsequent dusting and elimination of foreign material, adequate washing if the support permits.**

**USE:**

**To be used for brick masonry, mixed with stone and brick on surfaces previously treated with putty-based mortars or with mixed or hydraulic limes, for exteriors/interiors;**

**MIXING APPLICATION OF THE MALTINE:**

**To be mixed in mixers, whip drill or by hand, until a homogeneous mixture is obtained;**

**It is advisable to avoid adding water to the dough (in how much the product has natural retention in its mass of lime water), for any work requirements at your discretion**

**add a small amount of water to the dough;**

**To be applied with a trowel and trowel made of metal or wood sponge, to obtain the desired finish.**

#### **TO MAKE MORTARS HISTORICAL MORTARS:**

**The traditional lime putty cream is mixed with silica sand, white quartz silica, marble, limestone, travertine, earthenware, kaolin (igneous - sedimentary - metamorphic sands), always washed and sieved without the presence of materials clayey, of biological elements and various selected impurities in the right quantities of the particle size scales;**

**In the preparation of mortars - traditional malts based on air lime, the ancient rules carried out by the Masters always apply Craftsmen, if water is eventually added, it should be dosed gradually on the dough while continuing to stir the mixture.**

#### **AIR MORTARS:**

**CLASSIC EXAMPLES OF QUANTITIES PER PACK ON SITE MALTA MEDIO-FINE, MALTA FINE, EXTRA MORTAR - FINE.**

#### **MEDIUM – FINE MORTAR THICKNESS AT 3 mm:**

**In proportions:**

**10 kg of binder aged for 10 months;**

**30 kg of sand;**

**With variable particle size ranging from 3 mm <> 0.100 mm;**

**In the granulometric scale of coarse 10% - medium - fine 80% - fillers 10%;**

**Mixing water from 0.8% according to the period and temperatures of the mortar packing.**

#### **FINE MORTAR THICKNESS TO 2 mm:**

**The proportions:**

**Kg 10.250 grams of binder aged for 10 months;**

**Kg 30 parts of sand;**

**With variable particle size ranging from 2 mm <> 0.50 mm;**

**In the granulometric scale of coarse 10% - medium - fine 80% - fillers 10%.**

**Mixing water from 1% according to the period and temperatures of the mortar packing.**

#### **EXTRA MORTAR - THIN THICKNESS TO 1 mm:**

**The proportions:**

**Kg 10,500 grams of binder aged for 10 months;**

**Kg 30 parts of sand;**

**With variable granulometry ranging from 1 mm <> 0.50 mm;**

**In the granulometric scale of coarse 10% - medium - fine 80% - fillers 10%;**

**Mixing water from 1% to 1.2% according to the period and temperatures of the packing of the mortar.**

#### **AIR MORTARS MORTARS MADE HYDRAULIC:**

**Our air lime can be made hydraulic and employed in humid or submerged environments, to carry out construction works decorated surfaces. Adding when packing of the mortar mixture (binder + siliceous aggregates) fine aggregates of reactive products of silica/alumina oxide etc. which are the sands originating from volcanic eruptions such as pozzolana, azole, lapilli, trass, while cocchiopesto and kaolin (derived from firing clays) are highly hydraulic (aluminum silicate) and compatible by affinity to our traditional binder, hydroxide of football. It is made up on site with this very simple mixture the Ancient Roman cementum, a totally hydraulic binder Natural and Ecological, without impurities or industrial additives.**

**The robustness of these excellent hydraulic mortars and grouts they are time-tested, and its durability can still stand observe in the decorated surfaces of the ornamental apparatuses of Historical buildings Monuments Built by the Romans and to continue until the mid-1900s, still in perfect state of conservation, both if located in rigid climates and in marine climates.**

**The hydraulic aerial mortars have excellent resistances mechanical, preserving the plasticity, workability and the elasticity typical 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 the underlying moisture to evaporate easily from mortars. It retains the properties in flexibility and resistance under stress, with little tendency to form efflorescence, nor to form soluble salts, nor to mold formations e 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 to the 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. In all sectors they are used for the ease of preparation and workability of the mortars, for the precious and harmonious look what the surfaces get, and what make it a good product always used.**

#### **CLASSIC EXAMPLES OF QUANTITIES PER PACK HYDRAULIC MORTARS MORTARS ON SITE.**

##### **MEDIUM - FINE STANDARD HYDRAULIC MORTAR WITH THICK PYROPLASTIC SANDS**

**At 3mm:**

**In proportions:**

**10 kg of binder aged for 10 months;**

**10 kg of pyroclastic materials with a granulometric scale of 1 mm <> 0.50mm**

**20 kg of white quartziferous silica sand with particle size from 3mm <> 0.100mm;**

**In the granulometric scale of coarse 10% - medium - fine 80% - fillers 10%;**

**Mixing water from 6% to 7% 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 10% 11%.**

##### **FINE STANDARD HYDRAULIC MORTAR WITH COCCIOPESTO SANDS THICKNESS TO 2 mm:**

**The proportions:**

**Kg 10.250 grams of binder aged for 10 months;**

**10 kg of cocchiopesto with a granulometric scale of 1 mm <> 0.50 mm;**

**20 kg of white quartziferous silica sand with particle size from 2mm <> 0.100mm;**

**In the granulometric scale of coarse 10% - medium - fine 80% - fillers 10%.**

**Mixing water from 10% to 11% according to the period and temperatures of the packing of the mortar.**

**N.B. If pyroplastic materials are used to replace cocchiopesto, in the same quantities, the percentage of water is 6% 7%.**

##### **EXTRA FINE MORTAR THICKNESS TO 1 mm:**

**The proportions:**



**Kg 10,500 grams of binder aged for 10 months;**

**5 kg of cocchiopesto with granulometric scale from 1mm <> 0.50mm;**

**5 kg of pozzolan with granulometric scale from 1mm <> 0.50mm**

**20 kg of white quartz silica sand with granulometric scale from 1mm <> 0.50mm**

**In the granulometric scale of coarse 10% - medium - fine 80% - fillers 10%;**

**Mixing water from 8% to 9% according to the period and temperatures of the packing of the mortar.**

**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% (the percentage may vary based on its quality).**

**Basic cellulose has the property of retaining once wet the water and gradually return it to the mortar to adjust the right internal humidity in the setting and hardening phase, avoiding any dehydration and loss of binder strength.**

**If desired, clay, cocchiopesto, the fiber of natural hemp, flax fiber, straw etc.**

**For each layer, do not exceed 6 mm in thickness;**

**For higher thicknesses, spread the mortar in intervals from a time that varies from 8 hours to 12 hours from each other, in consideration of the season and temperatures;**

**The mortar, after being applied in the desired thickness, it must be kept humid (according to periods and temperatures environmental) for the time necessary for setting and hardening superficial (recommended from 8 hours to 12 hours);**

**Operating temperature: ambient +5 / +35 °c;**

**Time to use the mix: from 15 minutes to 30 minutes (mortars hydraulic) from 2/3 hours (aerial mortars), in consideration of the season and temperature;**

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

**Our traditional lime putty cream, is used and mixed as it is supplied by the manufacturing company;**

**The company's traditional lime putty cream Marseglia Srl, once applied, will maintain the quality the durability and tightness of the incorporated granules and of the its coloring.**

**THEORETICAL CONSUMPTION PER SQM OF MEDIUM - FINE MALTINA: INTONACHINI**

**The consumption of medium/fine mortar: varies from the thicknesses they want to achieve, with the quantity of 25 kg of putty cream traditional lime grease combined with 75 kg of sand mixed a various grain sizes, plasters are made for 21/22 square meters, with thicknesses ranging from 3 mm to m2, and in accordance with funds e**

**of the underlying surfaces; To carry out conservative restoration works:**

**of frescoes or wall paintings, of decorative ornaments both smooth and in relief, frames, jambs, friezes, additions of amalgams of stucco, murmur or faux marble, smooth and/or in relief, plastering of finishes, glazes, colored drabs, painting**

**and more etc., the quantities vary according to the thicknesses and the surfaces to be treated and leveled.**

#### **THEORETICAL CONSUMPTION PER SQM OF THE MORTAR FINE:**

**The consumption of the fine mortar: varies from the thicknesses required achieve, with the amount of kg 25,600 grams of cream traditional lime putty combined with 75 kg of mixed aggregates at various particle sizes; Artistic plasters are made for 25/24 square meters with thicknesses ranging from 2 mm per square meter, correspondingly of the largest granule in the granulometric curve used and in accordance with the underlying funds and surfaces;**

**To carry out works of Conservative Restoration of finishes: of frescoes or wall paintings, both smooth and relief decorative ornaments, frames, jambs, friezes, additions of stucco amalgams, murmur or imitation marble, smooth and/or relief mouldings, grouting of finishes, glazes, colored drabs, wall paints and more etc., the quantities vary according to the thicknesses and of the surfaces to be treated and leveled.**

#### **THEORETICAL CONSUMPTION PER SQM OF MALTA EXTRA - END:**

**To carry out works or carry out Conservative restorations: of frescoes or wall paintings, both smooth and raised decorative ornaments, frames, jambs, friezes, additions of stucco amalgams, murmurs or imitation marble, smooth and/or relief mouldings, grouting**

**of finishes, the quantities vary according to the thicknesses and the surfaces to be treated and leveled. While to run colored dull glazing works, wall painting and more, use the traditional lime putty cream rolled and homogenized, dilute it in the proportions of 1 kg of binder and 8/10 of mains water plus any pigments or colored earths, the colored lime milk is obtained, used for these processes.**

**Its consumption varies per square meter from 400 CC to 600 CC, in consideration of the surfaces to be treated.**

#### **COLORING OF THE BINDER WITH AGING AT 10 MONTHS:**

**Our cream of lime fat is suitable for your right degree of alkalinity to be coloured, with earths or pigments obtaining soft and decisive warm tones. The Ancient technique most used is to combine the pigments in the binder, with an extrafine micro-granulometry, have the property of dispersing uniformly in the binder and obtain a homogeneous colored paste.**

#### **FOR COLORING WE RECOMMEND:**

**To color the binder, add the pigments or earths little by little colored from 4% to 10% (according to the density of the desired coloring) on the quantity of the binder alone, in low speed mixers spins, for a useful period for its dispersion, once the coloring is obtained desired, join the sands in the specifications above listed, to achieve the colored mortars.**

**And/Or by combining the pigments or colored earths a little at a time, in a composed of lime milk (so mixed) 1 Kg of binder and 8/10 liters of mains water, stirring slowly, once dispersed and obtained the tint, pour it into the binder and mix slowly, amalgamated the solution, the sands are united in the specifications listed above. Thus obtaining a historic colored malt to make plasters - finished and colored plasters, to make decorative ornaments both smooth and in relief, frames,**

**grouting, jambs, various colored ornaments, etc. While to accomplish dull, colored veils, wall colors use milk of colored lime, composed as follows (1 kg of binder and 8/10 liters of mains water and add earths or natural pigments). With this Ancient methodology, the mortars or the colored lime milk solution (dull veiling and wall colors) once applied they will keep over time the coloring, since the color is fixed in the binder, in the carbonation stage of setting and hardening, forming a single body.**

#### **ROLLING AND HOMOGENIZATION**

##### **OF THE BINDER AT 10 MONTHS:**

**Upon request, this seasoning can be rolled and homogenized, this operation serves to eliminate those tiny grains, naturally present in lime putty and what about they also partially form the skeleton in the plasters and intonachini.**

**However, in detail these micro granules could affect the aesthetic finishes of artistic value in the restoration conservative of decorated surfaces.**

Test description	Unit of measure	Result
CaO+MgO content UNI EN 459-2	%	90.8
MgO content UNI EN 459-2 % 0.3	%	0.3
SO3 content UNI EN 459-2	%	4.5
CO2 content UNI EN 459-2	%	0.02
Free CaO content UNI EN 459-2	%	87.9
Free water content UNI EN 459-2	%	53.1

#### **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	%	11.5
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]	3,57 - 10 <sup>-08</sup>	3,77 - 10 <sup>-08</sup>	3,65 - 10 <sup>-08</sup>
Permeance at water vapor	$\Lambda$	[kg/m <sup>2</sup> s Pa]	1,89 - 10 <sup>-09</sup>	2,01 - 10 <sup>-09</sup>	1,94 - 10 <sup>-09</sup>
Vapor permeability coefficient ( $\mu$ )			<b>6,8</b>	<b>6,7</b>	<b>6,4</b>
AVERAGE vapor permeability coefficient ( $\mu$ )				6,6	

**CERTIFICATIONS EU 305/2011****STATEMENT IN PRODUCTION AND CERTIFICATE OF MCPF SEASONING**

The production begins with the wood firing of the pure limestone, which is achieved at low temperature (about 840-860°C), switch off of the oxide obtained, subsequent aging in the tank to obtain of the cream of pure slaked lime completely extinct, with a high content of calcium hydrate.

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

**worked lime putty cream, indications of the quality and title of the binder. (documents filed in archive)**

#### **SPECIFICATION ITEMS 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 valuables of Public Works, for packaging traditional mortars based on aerial or hydraulic limes, for works of Recovery in Monumental Historical Building sector OG/2 and for Conservative Restoration interventions in Category OS/2A – OS/25.**

#### **PACKAGING: 10 MONTHS**

##### **Shipping by Pallet:**

**from 5 buckets of 23 kg each;**

**from 10 buckets: from 23 Kg Each;-**

**from 15 buckets: from 23 kg each;**

**from 20 buckets: from 23 Kg Each;-**

**from 40 buckets: from 23 Kg Each;**

**Order code: GCS/M10**

#### **STORAGE:**

**If storing buckets indoors and covered, set them flat footrests and without drilling its plastic 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 kicks for construction in the Public Works sector, must comply with the UNI EN 459-1 Standard CE Marked and to follow in the Declaration of Conformity Document D. o. P.CPR (EU) N° 305/2011, and as understood in circular N° 1767 with law 21/06/1964 N°463, and as currently decreed by the Standard of the UNI 11488/2021 Regulation on Cultural Heritage for packaging traditional historical mortars in the works. And for how it mentions the according to the European Directive CE EN 998-1: 2016 (GP) (CR), binder, used for packing general interior mortars and external. The data from the analysis of quicklime in clods (from which it is obtained seasoned lime putty) included in this site, of Marseglia Calce Srl, are certified as calcium limestone CL/90S PL UNI EN 459-1 (GP) (CR) with a free CaO content of 87.90% UNI EN 459-2 and with total content of (CaO+MgO) of 90.80% UNI EN 459-2, with CE marking, D.o.P certificate and approved with CPR (EU) N° 305/2011 in the certificate of conformity on the quality of production in the MCPF factory.

Our production of slaked lime cream is made still in the Ancient and Craft methods. Limestone cooking it is made in an ancient vertical shaft oven with natural draft, with continuous cycle of wood cooking and subsequent seasoning in the tub.

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 the thermal rise of the heat in a completely natural way (chimney effect) spreading between the voids of the limestone stones, gradually heating them up at the limestone calcination temperatures 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 furnace, 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.

Plus our Ancient shaft oven with its separation system from the combustion chamber to the cooking chamber, avoid putting the flames in direct contact with the material cook inevitably altering it, compromising the quality and the purity of the limestone, as well as the whiteness, also for the ashes of ascent.

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, powered by gas 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 that vary from about 300/400C°, it 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 840/860C°. This cooking phase varies from 10 to 12 hours, to complete the transformation of the calcium carbonate CaCO<sub>3</sub> 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 CO<sub>2</sub>

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 14/15 days, according to the climatic conditions external (presence of wind energy), climatic factor which accentuates the chimney effect of the cooking system of the 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)<sub>2</sub>**

**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)<sub>2</sub> forming single porous macro - prismatic crystals ( portlandite). Thick Milk of Lime Ca(OH)<sub>2</sub> obtained is immersed in the maturation tanks, for months required for its use.**

**Lime hydroxide crystals Ca(OH)<sub>2</sub> in the ripening phase day 10 months, they undergo further important morphological changes and resize them with formation of single porous micro -**

**tubular / hexagonal crystals (portlandite).**

**With this ancient method, a slaked cream is obtained traditional lime fat aged 304 days, which is very thick, creamy, thixotropic, viscous and slightly oily, 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.**

**$\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$ ,**

**Thus returning to its initial state of calcium carbonate CaCO<sub>3</sub> with water loss H<sub>2</sub>O.**

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

**BINDER USED TO MAKE HISTORICAL MORTARS**