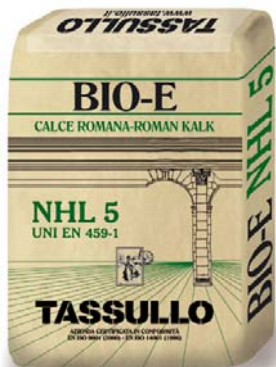


NHL5 NATURAL HYDRAULIC LIME



BIO-E is a natural, additive and blend-free hydraulic lime suitable for making highly-permeable masonry or plaster mortar which is low in soluble salts and chemical inerts in the presence of sulfates.

BIO-E conforms to UNE EN 459-1 regulations regarding the "Definition, specification and conformity criteria for building lime," is classified as NHL 5, and possesses the CE conformity marking in accordance with applicable law.

Comes in: 25 kg. bags or loose from silos

FIELD OF APPLICATION

BIO-E can be mixed with any inert substance which conforms to the norms of acceptance for inerts as stipulated by D.M. 03/06/68 allegato I.

BIO-E is suitable for making mortar which is low in water-soluble salts for masonry bedding in terracotta, stone and solid brick, for the creation of screed and highly-workable and permeable base-coat and finishing plaster which exercises excellent hygrometric regulation of surrounding environments.

BIO-E is very low in natural radioactivity (posses the ULTRA LOW RADIOACTIVITY marking), and is free of blends resulting from industrial processes, resins or other synthetic additives designed not only to improve performance of the finished product but also to improve overall productivity.

CHEMICAL CHARACTERISATION

The average components of **FEN-X CHIARO** are summarized in the following table, indicating its chemical composition expressed as oxides:

CaO	62%	MgO	1%	Al ₂ O ₃	5 %	K ₂ O	0,7%
Na ₂ O	0,3%	Fe ₂ O ₃	3,5%	SiO ₂	21%		

MINERALOGICAL CHARACTERISATION

FEN-X CHIARO is produced by the low-temperature heating of clayey lime (natural marl). Its principal mineralogical component is β -dicalcium silicate which, upon reacting with the water in the mixture, develops stable hydrated and chemically non-reactive compounds. These provide the mortar with the structural and elastic properties necessary for guaranteeing its durability over time.

FEN-X CHIARO does not contain tricalcium silicates and tricalcium alluminates, typically found in Portland cement.

MIXTURE PREPARATION

FEN-X CHIARO is to be mixed with selected inerts, free of organic substances and with an adequate granulometric curve in the ratio of 350÷450 Kg/m³ and clean water based on the desired consistency of the mixture. Mixing is to be carried out by hand or in a concrete mixer.

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APPLICATION

Mortar made on-site may be applied by hand or with an automatic machine suitable for the type of mixture created and inert substances used, respecting the warnings noted below as well as the standards of good workmanship. In the case of plaster, the rough surface must be smoothed with a trowel after screeding.

WARNINGS

Choice of inerts: BIO-E is to be mixed with pure inert substances selected with a proper granulometric curve. Use of inerts with defects or an excess of fine particles will create a mixture that is unworkable ("lean" or "fat"), with improper resistance and durability.

Wet surfaces: do not apply mortar made with BIO-E on surfaces impregnated with water, or where water may come into contact with the material during the first week after application.

Protection from freezing: do not apply mortar made with BIO-E at temperatures less than 5 °C and protect the product from freezing for the first 48/72 hours after application.

High temperatures, ventilation, absorbent surfaces: take all necessary precautions to avoid the mixture drying too rapidly (moistening of the surface, making of a preliminary rough coat, etc.)

Compressive strength: the mechanical characteristics of any mortar depend upon numerous factors, both environmental (temperature, humidity, cure time) and related to the making of the mixture (binder dosage, amount of water in the mixture, type of inert substances). The type of inert substances and the binder/inert ratio are, therefore, necessary information for considering the compressive strength of any mortar in real terms.

As an example of this, consider that the strength of BIO-E after curing may increase by approximately 30-40% by using an inert selected with a maximum granulometry of 5 mm. instead of 2 mm., and up to 60% by using an inert selected with a maximum granulometry of 15 mm. instead of 2 mm.

TECHNICAL DATA

Apparent density	approx. 1100 kg/m ³
Setting time	> 60'
Stability	< 1 mm
Compressive strength after 7 days	> 2 N/mm ²
Compressive strength after 28 days	> 5 N/mm ²
CaO _{free}	4 - 5 %
Refinement (exceeding 0.09 mm)	< 5 %
pH	> 10.4
Fire resistance class	A1

TECHNICAL SPECIFICATIONS

TASSULLO BIO-E natural hydraulic lime in conformance with UNI EN 459-1 regulations, is classified NHL5 and possesses the CE conformity marking in accordance with applicable law, suitable for making plaster mortar, masonry mortar, screed, finishing mortar, mortar for exposed facing or joint restoration, with a characteristic color tone and without chemical reactivity in the presence of sulfates; highly permeable and with a very low release of water-soluble salts, obtained by the on-site adding of pure inert substances selected with a ratio of 350 - 450 Kg/m³, plus water.