

# ROSENDALE



NATURAL CEMENT PRODUCTS

## Hydraulic Lime 17L

Rosendale Natural Cement-Gauged Lime for Repointing or Rebuilding of Historic Masonry

### DESCRIPTION

**ROSENDALE HYDRAULIC LIME 17L** is a series of custom-matched, pre-packaged natural cement-gauged lime masonry binders for use in renders and mortars for repointing or rebuilding of historic masonry. **ROSENDALE 17L** products are prepared on a project-by-project basis in conformance with specified mixes and/or traditional recipes for natural cement and lime mortars. They may be prepared as neat hydraulic binders to be blended in the field with appropriate aggregates, or may be fully formulated into ready-to-use mortars and stuccos. Gauging of lime with natural cement to produce hydraulic lime mixtures was a common practice in the 19<sup>th</sup> Century, and stuccos and mortars based on natural cement-gauged lime have often endured for more than 150 years, even under severe coastal exposures. **ROSENDALE HYDRAULIC LIME 17L** features high vapor permeability, tenacious adhesion and low modulus of elasticity.

### FEATURES

**ROSENDALE HYDRAULIC LIME 17L** offers performance features which are unique to natural cement products, including:

- **Fast Initial Set:** Typical initial set time is 20-60 minutes, and final set time is 40-120 minutes. Setting time is prolonged in mixtures containing higher proportions of lime.
- **Moderate Strength:** Compressive strength is similar to fully-reacted lime mortars, typically 300-1200 psi, depending on the specific proportions of each formulation. Unlike non-hydraulic lime products, which set only at the surface and then require long periods of time for deeper reaction with atmospheric carbon dioxide, natural cement is a true pozzolan, permitting lime mixtures to achieve full-depth set within minutes or hours. Because natural cement is produced by firing at the same relatively low temperatures used in building lime production, it is free of tricalcium silicates and aluminates which have been linked to incompatibility with historic lime masonry.
- **Water Resistance:** Natural cement-gauged hydraulic lime mortars withstand severe wind-driven rain exposures within a short time of application, facilitating installation. They are also suitable for use at lower temperatures than ordinary lime and natural hydraulic limes..

- **Early Freeze Resistance:** Natural cement-gauged lime products require only a relatively short period of protection from freezing, facilitating installation over the course of a much-extended working season in northern climates, as compared with lime and hydraulic lime products.
- **Low Modulus:** Unlike Portland cement-lime mortars which tend to embrittle with time, natural cements continue to relieve stress and remain mechanically compatible with masonry substrates, even after more than a century of performance. **ROSENDALE HYDRAULIC LIME 17L** mortars can provide long service life without cracking or delamination from masonry units.
- **High Permeability:** **ROSENDALE HYDRAULIC LIME 17L** provides high rates of moisture vapor transmission, assuring that buildings and structures will “breathe”, and avoiding moisture entrapment.
- **Customization:** Natural cement-gauged lime mortars were historically formulated in a wide range of proportions. 80-90% lime binder gauged with 10-20% natural cement was commonly used for applications where lime mortars benefited from faster set and cure without compromising lime performance properties.

#### APPLICATIONS:

- **ROSENDALE HYDRAULIC LIME 17L** mortars and stuccos may be formulated and used as authentic duplicates of original, historic mortars for the thousands of surviving buildings and structures originally built using natural cement-gauged lime mortars.
- **ROSENDALE HYDRAULIC LIME 17L** may also be used in applications where original mortars or stuccos were entirely lime-based, in situations where adverse weather, reduced curing requirements and faster resistance to rain and frost are required.

#### FORMULATION:

- **Rosendale Natural Cement** is authentic natural cement produced from argillaceous limestone mined in the Rosendale Historic Cement District. The cement district is the source of more than 50% of all the natural cement produced in North America. Natural cement was produced to meet the requirements of ASTM C10 specifications, withdrawn in 1976 when natural cement was no longer commercially available.
- **Lime** incorporated in **ROSENDALE HYDRAULIC LIME 17L** mortars can be customized to meet individual project requirements. Historically, hydrated dolomitic lime was the most commonly used building lime in North America, and is faithfully reproduced using a fully hydrated dolomitic building lime meeting the specifications of ASTM C207 Type S. High calcium limes may alternatively be incorporated, or lime can be omitted in order to allow on-site addition of lime paste (putty) or field-hydrated quicklime.

#### INSTALLATION:

**ROSENDALE HYDRAULIC LIME 17L** natural cement-gauged lime mortars are applied in accordance with traditional masonry practices. These practices are taught to masons and restoration contractors in the course of hands-on training workshops, which are offered on a regular basis. On-site training services are also available. Applicators meeting the performance requirements of the training workshop are individually certified. Alternate provisions are made

for acceptance of experienced masons who have demonstrated their knowledge and abilities in traditional masonry practices.

General installation guidelines are typical of all traditional masonry mortars. Substrates must be sound, clean, roughened and properly prepared. Thorough pre-wetting of masonry is required to assure that the mortar will not dry too quickly. **ROSENDALE HYDRAULIC LIME 17L** must be mixed with clean water in accordance with printed mixing instructions, and water addition levels must be controlled in order to obtain optimum color uniformity and best performance.

Mixed mortar must be used before initial set, so mix only as much material as will be used within 10 to 30 minutes. Once material has begun to set, it should not be re-tempered or adjusted with additional water, but should be discarded.

Once the surface has been tooled, it must be maintained in a damp condition throughout its curing period. Generally, this period of wet curing will be from 3 to 21 days, depending on formulation and conditions. Consult Edison Coatings for curing guidelines for your specific project conditions. Acceptable curing methods include draping burlap over the fresh mortar or stucco and maintaining the burlap in a damp condition, or frequent misting with water.

## PERFORMANCE

While individual custom formulations will vary in their properties, the following are typical for Rosendale natural cement products.

PROPERTY	TYPICAL VALUES
SET TIME	Initial: 30 – 120 minutes Final: 60 – 240 mins.
COMPRESSIVE STRENGTH	Typically 300-1200 psi @ 90 days
MODULUS OF ELASTICITY	535,000 to 640,000 psi (All Rosendale)
TENSILE STRENGTH	35-75 psi at 90 days
MODULUS OF RUPTURE	400 - 600
DRYING SHRINKAGE	<0.3%



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