

Natural Cement 10C

ASTM C10 Compliant Natural Cements for Restoration of Historic Concrete & Masonry

DESCRIPTION

ROSENDALE 10C are natural cements for use in restoration of historic concrete and masonry and in green building. The cements are prepared in conformance with traditional specifications, faithfully reproducing the natural hydraulic cements used in the 19th and early 20th Centuries. Mortars, stuccos and concretes based on natural cement have endured for more than 200 years, even under severe coastal and seawater immersion service exposures, and feature high vapor permeability, tenacious adhesion and low modulus of elasticity.

ROSENDALE 10C cement is produced from argillaceous limestones conforming to the requirements of *ASTM C10 Standard Specification for Natural Cement*.

FEATURES

ROSENDALE 10C offer long-term performance features which are unique to natural cement products, including:

- **Initial Set: For Natural Cement**, typical initial set time is 30-60 minutes. For **Quick-Setting Natural Cement**, initial set time is 10-30 minutes. Typical final set time is 40-120 minutes. Time of setting can be prolonged by post addition of SYSTEM 22 set retarding admixture or by use of the cement in mixtures containing higher proportions of hydrated lime. Set retarders can also be added at the factory. Product packaging reflects any such functional additions, as required by the ASTM C10 Standard.
- **Moderate Strength:** Unlike 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 hydraulic cement, achieving full-depth set within minutes or hours. Ultimate strength then develops over the course of 30-90 days' cure.

- **Water Resistance:** Natural cements withstand severe weather exposures within a short time of application, facilitating installation. They are also suitable for water immersion when unmodified with lime.
- **Early Freeze Resistance:** Natural cement that will not be subjected to saturated conditions requires 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. Longer cure times are required before freezing and functional additions are recommended for mortars that will be frozen while saturated. Consult Edison Coatings for guidance on applications of this type.
- **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 10C** can provide long service life without cracking or delamination from masonry units.
- **High Permeability:** **ROSENDALE 10C** provide high rates of moisture vapor transmission, assuring that buildings and structures will “breathe”, and avoiding moisture entrapment. Because of their high permeability, the cements will typically carbonate fully within 12 months.
- **Customization:** Fineness of grind standards changed over time, with the later, finest-ground cements producing the highest strengths and reactivity. **Rosendale 10C** cements are produced on a made-to-order basis for each project, to achieve the greatest historic authenticity and to meet the optimum performance levels of each application.
- **Optional Additions:** A number of optional functional additions are available, including set time retarders, air entraining agents or other additives to enhance freeze-thaw performance and superplasticizers to facilitate use in form-and-pour applications. When used, additions are always listed on product packaging, as required.

APPLICATIONS:

- **ROSENDALE 10C** cements may be formulated and used as authentic duplicates of original, historic cements for restoration of the thousands of surviving buildings and structures originally built using natural cement materials. Common uses include masonry mortars for repointing or rebuilding, stuccos, grouts, whitewashes, concretes and composite repair mortars. Edison Coatings also produces pre- packaged, pre-matched custom mortars, stuccos, grouts, coatings and concrete mixes, eliminating errors in field-proportioning.
- **ROSENDALE 10C** may also be used in applications where original materials were entirely lime-based, in situations where adverse weather, reduced curing requirements and faster resistance to rain and frost are required, or in salt- contaminated structures where lime functions poorly as a restoration material.

FORMULATION:

- **ROSENDALE 10C** are authentic natural cements, produced from argillaceous limestone extracted from quarries and mines used during the 19th Century to produce historic natural cement materials.

- **ROSENDALE 10C Natural Cement and Quick-Setting Natural Cement** conform to the respective requirements of *ASTM C10 Standard Specification for Natural Cement*.
- **Colorants** can be incorporated, customized to meet individual project requirements.
- *Starter formulations for masonry mortars, concrete, grout, stucco and whitewash are available from Edison Coatings, Inc.*

INSTALLATION:

ROSENDALE 10C natural cements are used in accordance with traditional concrete and 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.

Generally, workability of natural cement mortars, stuccos, grouts and concretes is excellent, and many tradesmen have expressed preference for working with natural cement over portland cement-lime combinations. Proportioning guidelines are different from modern cement materials, however, and misproportioning will diminish performance. Consult Edison Coatings, Inc. for guidance on proper proportioning of natural cement mixtures.

General installation guidelines are typical of all traditional masonry materials. Substrates must be sound, clean, roughened and properly prepared. Thorough pre-wetting of substrate is required to assure that the cement mixture will not dry too quickly. **ROSENDALE 10C** must be mixed with clean water, and water addition levels must be controlled in order to obtain optimum color uniformity and best performance.

Mixed materials must be used before initial set, so mix only as much material as will be used within 10 minutes for Quick-Setting Natural Cement and 30 minutes for Regular Natural Cement. Temperature affects time of setting. Once material has begun to set, it should not be re-tempered or adjusted with additional water, and should be discarded.

Once the surface has been tooled or finished, it must be maintained in a damp condition throughout its curing period. Generally, this period of wet curing will be at least 3 days, with actual requirements 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 material and maintaining the burlap in a damp condition, or frequent misting with water.

PERFORMANCE

While individual custom formulations will vary in their properties, the data summarized in the tables are typical for **ROSENDALE 10C**. Compressive strength development over time is reported for various mix proportions of natural cement and sand, with or without hydrated lime addition. For more complete information, contact your Edison Coatings Technical Representative.

Compressive Strength of Natural Cement 12M Mortar

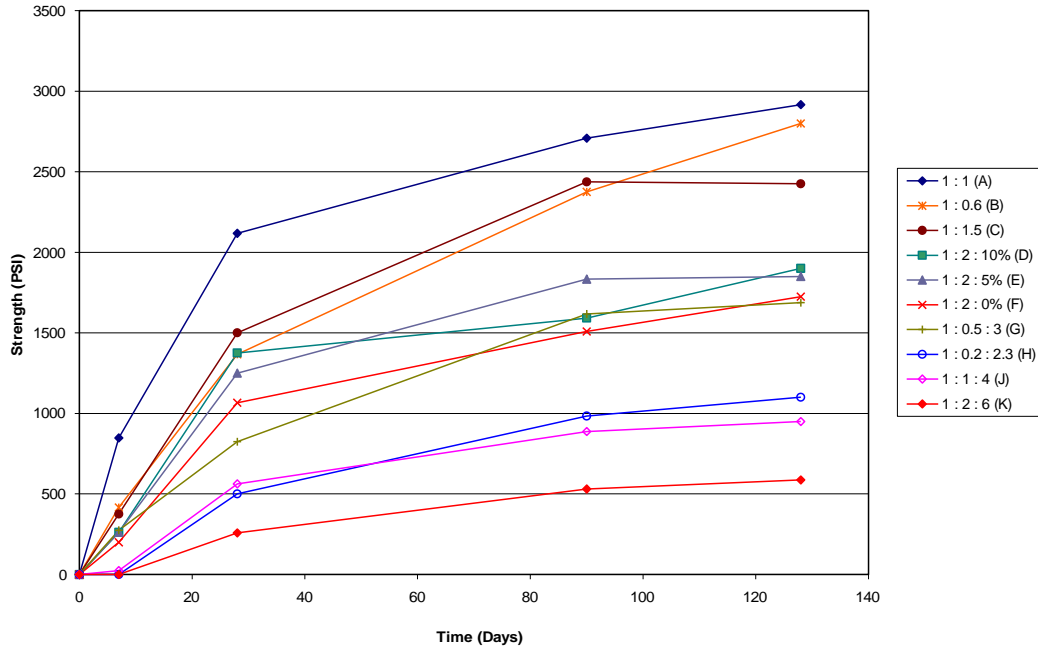


Figure 1. Compressive Strength Development in natural cement mortars of various proportions.

PROPERTIES	ROSENDALE 10C
Time of Setting, initial, ASTM C191	Regular: >30 minutes Quick Setting: >10 minutes
Autoclave Expansion	<0.8%
Air Content of Test Mortar	5.3%-7.0%
Compressive Strength, ASTM C109, psi	
7 days	730-2,260
28 days	1,830-2,930
Blaine Fineness, m ² /kg	403-545
Water Soluble Alkali, %	<0.2%

Figure 2. Typical properties of Rosendale 10C Regular and Rosendale 10C Quick-Setting natural cements.



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