



Injection Grout 11G

Natural Cement-Based Grout for Filling Voids in Historic Concrete & Masonry

DESCRIPTION

ROSENDALE 11G are pre-packaged natural cement-based grouts for filling of voids in historic concrete and masonry. Grouts based on natural cement have endured for more than 135 years, even under severe coastal and seawater immersion service exposures, and feature high vapor permeability, tenacious adhesion and low modulus of elasticity.

ROSENDALE 11G are sanded grouts for filling of voids and capable of flowing into cracks and cavities as small as 10 mm (~3/8").

ROSENDALE 11G grouts may be custom designed and produced to meet the special requirements of each project. Natural color or custom color-matching are available to provide aesthetic compatibility with original materials as well as long-term mechanical performance.

FEATURES

ROSENDALE 11G offer long-term performance features which are unique to natural cement products, including:

- **Controlled Initial Set:** Initial set times between 10 and 90 minutes may be obtained, providing adequate flow time without the risk of delayed oozing or streaking. Setting time is prolonged at low temperatures and in mixtures containing higher proportions of hydrated lime.
- **Moderate Strength:** Compressive strength is controlled in formulation and may be selected within a range of available strengths. Typically, strengths may be set from 600 to 2200 psi, depending on the specific proportions of each formulation. 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.
- **High Flow:** Grouts are formulated to achieve high flow at moderate water addition levels.

- **Water Resistance:** Natural cement grouts withstand severe wind-driven rain 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 products that will not be subjected to saturated conditions require only a relatively short period of protection from freezing. This facilitates 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 exposure to freezing for mortars that will be frozen while saturated. Consult Edison Coatings for guidance under these conditions.
- **Low Modulus:** Unlike Portland cement and cement-lime grouts 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 11G** grout provides long service life without cracking or delamination from masonry units.
- **High Permeability:** **ROSENDALE 11G** provides high rates of moisture vapor transmission, assuring that buildings and structures will “breathe”, and avoiding moisture entrapment.
- **Customization:** **ROSENDALE 11G** grout can be produced on a made-to-order basis for each project, to meet the optimum performance levels of each application.

LIMITATIONS:

Cementitious grouts are not intended for use on dynamic cracks caused by structural behaviors such as ongoing settling, structural instability, thermal expansion or corrosion of embedded metals. Grouts are best selected and applied under the direction of an experienced grouting engineer.

APPLICATIONS:

- **ROSENDALE 11G** grout may be used for filling voids in historic concrete, stucco, masonry and stone.
- **ROSENDALE 11G** grout may be used for repair of structural damages under the direction of a licensed professional engineer.

FORMULATION:

- **Rosendale Natural Cement Products®** are produced from argillaceous limestones conforming to the requirements of *ASTM C10 Standard Specification for Natural Cement*.
- **Lime**, in cases where it is incorporated in **11G** grouts, can be customized to meet individual project requirements. Hydrated dolomitic lime meeting the specifications of ASTM C207 Type S or Type N high calcium limes, with or without air entrainment admixtures may be incorporated.

- **Mineral Fillers** incorporated in **ROSENDALE 11G** grout may also be customized to meet individual project requirements. Fillers are selected to match original materials as closely as possible in color and composition.

INSTALLATION:

Grouting procedures can vary considerably from one application to another. The following are some general guidelines:

1. Loose materials, such as de-bonded masonry mortar, loose bricks or delaminated concrete must be removed and replaced prior to injection.
2. Injection holes should be drilled to enable delivery of grout to the full length and depth of the cavity to be filled. Holes are generally drilled near the top and bottom of the area to be filled, beginning at the upper and lower corners and then every 3 to 9 inches along the upper and lower edges of the cavity. The lower row may be drilled square with the surface (at 90⁰ to the wall surface). The upper row of holes should be drilled at a downward angle. Diameter of the holes drilled may vary with the intended method of grout delivery. For typical delivery by grout pump through ½” pressure hose, a ¾” hole is required.
3. Seal the face of any cracks or gaps with temporary non-staining clay, sealant or mortar.
4. All void cavities must be thoroughly flushed with clean water to remove as much dirt, debris and contaminants as possible and to pre-saturate the areas to be grouted. Continue flushing until clean water runs from the lowest port. A minimum of 20 minutes of pre-wetting should be performed prior to grouting. Repeat pre-wetting if either drying occurs prior to injection or if more than two hours elapse from the time of pre-wetting.
5. Some methods of grouting involve injecting from the lowest port, followed by plugging of the injection port once grout flows from the port above. Other methods involve injection from the upper port, plugging the lower port once grout begins to flow from the port. **IIG** products are compatible with a variety of good grouting practices and equipment.

Thoroughly mix the **IIG** product selected using a mortar mixer or slow speed drill. (250-450 rpm, “Jiffy” type mixing tool). Add approximately ¾ of the water required, mix under shear for 3-4 minutes and then adjust final consistency with water.

ROSENDALE 11G: 5.5 - 6.5 quarts water per 50-lb. pail
5.2 - 6.2 liters per 22.7 kg pail

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.

Generally, it is desirable to maintain damp curing conditions for 3-7 days, but on properly pre-dampened masonry void injection applications, this generally does not require any special action. Consult Edison Coatings for curing guidelines for your specific project conditions.

PERFORMANCE

While individual custom formulations will vary in their properties, the following are typical for **Rosendale 11G** natural cement grouts.

PROPERTY	TYPICAL VALUES
SET TIME	Initial: 10-90 minutes
COMPRESSIVE STRENGTH	Typically 600-2200 psi @ 90 days
MODULUS OF ELASTICITY	535,000 to 640,000 psi
TENSILE STRENGTH	35-75 psi at 90 days
MODULUS OF RUPTURE	400 - 600
FLOW TIME	5-30 minutes



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