

# Edison Coatings, Inc.

NATURAL HYDRAULIC CEMENT



QUICK SETTING

## MARFIL<sup>®</sup> Natural Hydraulic Cement

**MARFIL<sup>®</sup> Natural Hydraulic Cement** is a high-quality, quick-setting natural cement for use in concretes, mortars and plasters for historical building restoration, quality building/construction and green building.

It conforms to NORM **UNE EN 80.309-May 2006**, which defines that the composition of natural cements is obtained by calcination of natural marls at a sufficiently high temperature, but below that of its clinkerization or sintering.

### CHARACTERISTICS AND USE

**MARFIL<sup>®</sup>** is produced by low-temperature (1000-1200<sup>0</sup>C) calcination of calcareous marls. The traditional process involves firing and then grinding to a fine powder prior to final packaging.

MARFIL, produced by Cementos Collet in Spain for more than 120 years, comes from one single geological stratum of constant composition. It is obtained exclusively by mining, with no blending or additions, and as such its composition is exceptionally consistent.

This authentically processed Natural Hydraulic Cement is used in the preparation of mortar for masonry, stucco and plaster and for precast and cast-in-place concrete. MARFIL<sup>®</sup> is also uniquely suited for use in groundwater exposures, due to its high sulfate resistance.

### PACKAGING AND STORAGE

The product is available in 20 kg (44-lb) Bags. Store in a protected, dry place, off the ground.

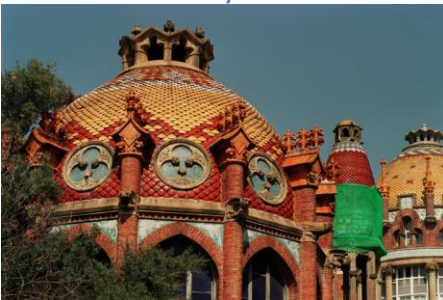
### AGGREGATE BLEND

**MARFIL<sup>®</sup> Natural Hydraulic Cement** is traditionally used without sand for the construction of vaulted Catalan ceilings and domes, but for mortars it will typically be blended at a volume ratio of 2 parts aggregate to 1 part MARFIL<sup>®</sup>. To produce softer compositions, it may be blended with Lime or Natural Hydraulic Lime, which also extend the working time.

Pre-blended, color-matched, ready-to-use mortars, plasters and stuccos (requiring water addition only) are also available from Edison Coatings, Inc. Set times may also be factory-adjusted on request.



Hospital Cupola Merce, Spain, constructed with Marfil<sup>®</sup> Natural Hydraulic Cement



## APPLICATION



MARFIL may be used in a wide variety of applications using an array of different equipment and methods. PHOTO: Shotcreting in a subterranean tunnel.

**MARFIL**® is a naturally quick-setting cement, with typical initial set time of 2-3 minutes and final set time of 4-5 minutes. These times are extended when working at lower temperatures, at higher water-cement ratios and/or with mixtures incorporating lime and sand. Set times are also completely adjustable through addition of [System 22 Retarder](#) from Edison Coatings.

The following are general guidelines for use:

- **Water-Cement Ratio:** It is important to respect product water-cement ratio limitations. Optimum performance will be obtained at a water-cement ratio of 0.33. Do not exceed water-cement ratio of 0.4. Water reducers and superplasticizers may be added subject to review and approval by Edison Coatings, Inc.
- **Temperature:** Both the ambient air and the substrate should be between 5°C (40°F) and 35°C (95°F).
- **Surface Preparation:** Surfaces must be clean and free of any dust, oils, residues, bacteria, mildew, mold or other organic matter, salt efflorescence, or any other loose material.
- **Pre-Dampening:** Before applying, moisten absorbent surfaces to reduce suction, but avoid ponding or complete saturation.
- **Pre-Hydration:** Due to the product's rapid setting characteristics, do not allow mixtures to stand for a period of pre-hydration. Mix only what will be used in time before initial set and use immediately. Do not retemper or readjust consistency by adding additional water once blended.
- **Application:** Recommended maximum thickness per application is not to exceed 1.5 cm (1/4" inch). Once the material has been placed and properly compacted, successive applications, for installations requiring additional thickness, should be made immediately, building all the way out to the final profile in a single, continuous procedure.
- **Finishes:** **MARFIL**® Natural Hydraulic Cement has excellent water resistance and may remain exposed directly to weather. It may alternatively be coated with compatible finishes. In order not to compromise water vapor permeability and natural appearance, use breathable finishes such as [EverKote 300 Mineral Coatings](#).
- **Protection & Curing:** Once applied, the product should be protected for a minimum of 72 hours from rapid drying due to direct sun or air movement. Light periodic misting should be performed several times a day for the first 3 days, or the product may be covered with impermeable tarps.

## TECHNICAL CHARACTERISTICS \*

	MARFIL® Natural Hydraulic Cement		Standard UNE-800.309:2006	
Density	1.05g/cm (~60 lb./cu.ft.)			
Color & Appearance	Fine powder, light brown/tan color			
Compressive Strength, Neat Cement	<b>w/c 0.33</b>	<b>w/c 0.40</b>	<b>CNR 8</b>	<b>CNR 4</b>
1 hour	8.2 MPa/1189 psi	2.0 MPa/290 psi	1.0 MPa/145 psi	0.5MPa/73 psi
3	12.7/1841	4.3/623	1.5/217	0.8/116
6	18.0/2610	7.0/1015	2.0/290	1.0/145
24	24.5/3552	10.3/1493	2.5/362	1.2/174
7 days	26.5/3842	11.1/1609	5.2/754	2.0/290
28 days	27.8/4031	12.2/1769	8.0/1160	4.0/580
Flammability	Non-combustible			

\*The above data were derived from laboratory measurements. This document is not intended for use as a minimum performance specification.



## CHEMICAL COMPOSITION (%)

	Average sample (Alkaline Separation)	According to <b>UNE 80.309 - 2006</b> <b>EN 196 - 2</b>
TiO <sub>2</sub>	<b>0.24</b>	
SiO <sub>2</sub>	<b>22.0</b>	> 18
Al <sub>2</sub> O <sub>3</sub>	<b>8.9</b>	> 5
Fe <sub>2</sub> O <sub>3</sub>	<b>3.0</b>	> 2
CaO	<b>46.7</b>	> 45
MgO	<b>2.4</b>	Not considered
SO <sub>3</sub>	<b>3.0</b>	< 4.0
K <sub>2</sub> O	<b>1.7</b>	Not considered
Na <sub>2</sub> O	<b>0.27</b>	Not considered
P.F. 550° C	<b>1.1</b>	Total loss
P.F. 550 a 950° C	<b>10.2</b>	< 16
free CaI	<b>0.80</b>	Not considered
Insoluble residue	<b>9.2</b>	< 10
Soluble fraction	<b>90.8</b>	
Alkalis expressed in Na equivalent	<b>1.4</b>	Not considered

## SAFETY

For complete information regarding correct storage, use and disposal methods and, please see **SDS**. Cement is a naturally caustic (rapid absorption) material due to its high pH origin and creates an alkaline reaction when combined with water. Protect the eyes and skin from exposure. Keep out of reach of children. Dust may cause irritation to eyes, skin, nose, throat and upper respiratory tract. Avoid irritation by reducing exposure to dust. Use in a well-ventilated area or provide sufficient local ventilation. Do not ingest. If dusty, wear a NIOSH/MSHA- approved dust respirator. Wear eye protection. If eye contact occurs, flush thoroughly with water for 15 minutes. If irritation persists, call a physician.

## FOR COMMERCIAL AND INDUSTRIAL USE ONLY

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**Exclusive North American Agent / Distributor**

**3 Northwest Drive, Plainville, CT 06062**

Phone: (860) 747-2220 or (800) 341-6621

E-mail: [edison@edisoncoatings.com](mailto:edison@edisoncoatings.com)

Fax: (860) 747-2280 or (866) 658-1189

Internet: [www.edisoncoatings.com](http://www.edisoncoatings.com)



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