

CEMENT

Masonry Cement

Engineered for quality and reliability, Lafarge cements for masonry deliver consistent performance.



bringing materials to *life*™



Lafarge in North America

The Lafarge Group is the world leader in building materials, with top-ranking positions in all of its businesses: Cement, Aggregates & Concrete and Gypsum. The Group employs 78,000 employees in 78 countries. Lafarge is the largest diversified supplier of construction materials in the United States and Canada.

The Lafarge Group places innovation at the heart of its priorities, working for sustainable construction and architectural creativity.



Lafarge Masonry Cement is specially formulated and manufactured to produce masonry mortar for use in brick, block, and stone masonry construction when properly mixed with mason's sand and clean, potable water. Lafarge Masonry Cement is also used to produce stucco.

Lafarge Masonry Cement is scientifically manufactured using the highest quality portland cement clinker interground with plasticizers together with other materials introduced to enhance durability, setting time, water retentivity and workability. These ingredients are accurately proportioned and controlled throughout the manufacturing process to assure a uniform product, color and a masonry cement that exceeds the current ASTM C 91 masonry specifications. The role of mortar in construction is to join the individual units together, resulting in masonry with performance characteristics that meet the needs of the architect, engineer, contractor, mason and owner.

In the Plastic State

> **Workability** The workability of plastic mortar depends on its ability to be spread easily, its ability to cling to vertical surfaces and its resistance to flow during placement of a masonry unit.

> **Water Retentivity** This property resists rapid loss of mixing water to the air on a dry windy day or to an absorptive masonry unit. Rapid loss of water causes the mortar to stiffen quickly, making it difficult to obtain good bond and weathertight joints.

> **Consistent Rate of Hardening** Consistent rate of hardening assists the mason in laying the masonry units and in tooling the joints to the same degree of hardness. Uniform color of masonry joints reflects proper hardening and consistent tooling times.





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In the Hardened State

> **Bond** The term “bond” refers to a specific property that can be subdivided into:

- extent of bond or degree of contact of the mortar with the masonry units; and
- tensile bond strength, or force required to separate the units. A chemical and mechanical bond exists in each category.

Many variables affect bond, including:

- mortar ingredients, such as type and amount of cementitious materials, water retained and air content;
- characteristics of the masonry units, such as surface texture, suction and moisture content;
- workmanship, such as pressure applied to the mortar bed during placing; and
- curing conditions, such as temperature, relative humidity and wind.

> **Durability** Corrosion by aggressive environments and unsound materials can contribute to the deterioration of mortar joints. Major destruction can be caused by water entering the mortar and freezing. Since air-entrained mortar will withstand hundreds of freeze-thaw cycles, its use provides good protection against localized freeze-thaw damage.

> **Strength** Compressive strength of mortar is largely dependent on the type of masonry cement used in preparing the mortar. High-strength mortars should not be arbitrarily specified under the assumption that the increased strength will improve the quality of the masonry. Strength should meet the property specification of ASTM C 270.

> **Appearance** Uniformity of color and shade of the mortar joints greatly affects the overall appearance of a masonry structure. Atmospheric conditions, admixtures and moisture content of the masonry units are some of the factors affecting the color and shade of mortar joints. Other factors affecting appearance are uniformity of proportions in the mortar mix, water content and time of tooling the mortar joints.



Standard Compliance

Lafarge Masonry Cement meets or exceeds all the requirements specified in ASTM C 91 *Standard Specification for Masonry Cement*. Lafarge Masonry Cement, when combined with well-graded masonry sand meeting the requirements of ASTM C 144, will produce mortar conforming to the Proportion and Property Specification of ASTM C 270 *Standard Specification of Mortar for Unit Masonry*.

Three Types of Masonry Cement Manufactured

Types N, S and M masonry cement are manufactured by Lafarge North America. Lafarge Masonry Cement eliminates the need to field proportion materials. A more uniform mortar can be obtained when only one blending operation is involved.

Better workability, reduced cost and ease of handling on the site are some of the advantages that will result when Lafarge Masonry Cement is used.

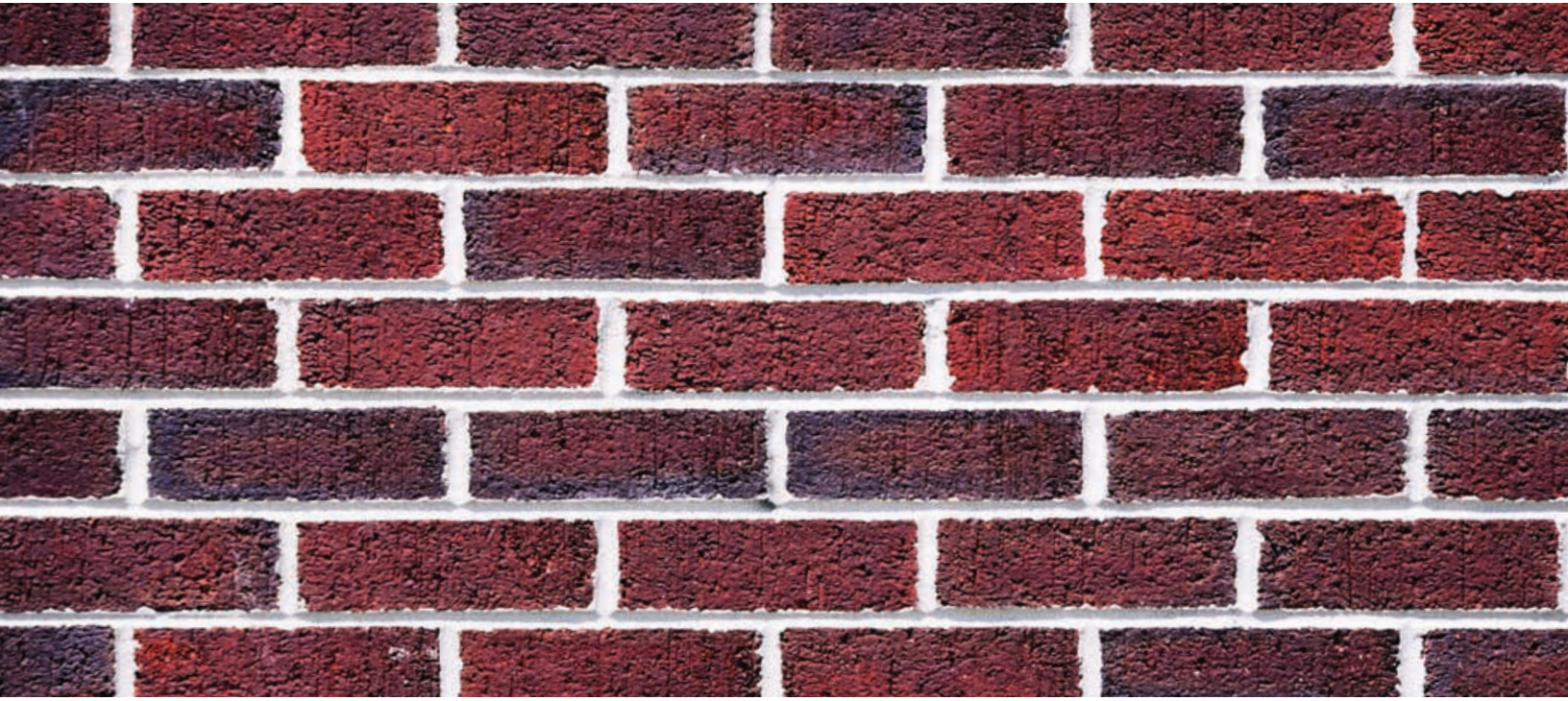
Starting with the highest quality materials, Lafarge North America maintains precise control over every step in the manufacture of its masonry cement by using the latest in controlled equipment, assuring high quality and uniformity of the finished product.

The following table is a suggested guide for the selection of mortar type; however, other considerations such as climate, exposure, type of masonry unit, applicable building codes and engineering requirements should also be considered.



Suggested Guide for Selection of Mortar Type

Location	Building Segment	Mortar Type
Exterior, above grade	load-bearing wall	S
	parapet wall	S
	non-load-bearing wall	N
Exterior, at or below grade	foundation walls, retaining walls,	S or M
	manholes, sewers, pavements,	
	walls, patios	
Interior	load-bearing wall	S
	non-load-bearing partitions	N



Recommended Mortar Specifications by Volume

ASTM C 270 defines the properties and proportions for mixing masonry cement mortars as follows:

Mortar Type	Masonry Cement (bags)	Damp, Loose Sand (cubic feet)	Average 28 Day Compressive Strength PSI (Mpa)
N	1	2-1/4 to 3	750 (5.2)
S	1	2-1/4 to 3	1800 (12.4)
M	1	2-1/4 to 3	2500 (17.2)

Property Requirements for Masonry Cement

Based on ASTM C 270

Masonry Types	Compressive Strengths at 28 Days psi (Mpa)	Water Retention min %	Air Content max %
N	750 (5.2)	75	20
S	1800 (12.4)	75	18
M	2500 (17.2)	75	18

Physical Requirements for Masonry Cement

Based on ASTM C 91

Masonry Types	Compressive Strengths at 28 Days psi (Mpa)	Water Retention min %	Air Content max %
N	900 (6.2)	70	21
S	2100 (14.5)	70	19
M	2900 (20.0)	70	19



> **Mixing:** In accordance with the ASTM C 270 proportion specification, batch at the rate of one bag of Lafarge Masonry Cement to 2-1/4 to 3 cubic feet of mason's sand, complying with ASTM C 144, and potable water. First, add 2/3 of the water followed by 1/2 of the sand, all of the cement, and then the remainder of the sand and water. Continue mixing the mortar for a minimum of five minutes after all of the materials have been charged. The resulting mortar should meet or exceed the property requirements of ASTM C 270. Use of a cubic foot box to measure sand will improve batch-to-batch uniformity.

> **Tooling of Joints:** Tooling of masonry mortar joints increases the density, durability and water permeance of the mortar. Tooling also increases the bond between the masonry mortar and the masonry unit.

The moisture content of the masonry at the time of tooling will affect final masonry mortar color. Early tooling results in lighter mortar joints and delayed tooling results in darker mortar joints.

> **Cleaning:** Hardened mortars can be damaged by improper cleaning procedures. The use of strong chemicals or harsh physical cleaning methods will deteriorate or change the appearance of the mortar joints and are specifically not recommended.

> **Composition and Materials:** Masonry cements are composed of portland cement, plasticizers, and air entraining additives. These components are proportioned at the cement plant under controlled conditions to assure uniformity of performance.

Lafarge Types N, S, and M Masonry Cement is used to make Types N, S, and M mortar, as defined in ASTM C 270, when mixed with water and 3 parts of mason's sand and clean, potable water.

> **Limitations:** When admixtures are considered for use with Lafarge Masonry Cement in masonry construction, it is recommended that admixture and mortar be laboratory tested at the temperature extremes anticipated at the job site.



CEMENT



Product Name

Lafarge Masonry Cements:
Type N, Type S and Type M

Manufacturer

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Technical Data

Applicable standards: Lafarge Masonry Cement conforms to ASTM C 91 *Standard Specification for Masonry Cement*. Masonry cement is used to produce ASTM C 270 Types N, S, and M mortars for unit masonry as outlined in either the property specification or proportion specification requirements of ASTM C 270. Requirements for sand to be used with masonry cement to produce ASTM C 270 mortars are found in ASTM C 144 *Standard Specification for Aggregate for Masonry Mortar*.

Lafarge Types N, S, and M Masonry Cement will make ASTM C 270 mortar for unit masonry with minimum compressive strengths of 750 psi, 1800 psi and 2500 psi in 28 days, respectively, when properly mixed with mason's sand conforming with ASTM C 144 and tested in full accordance with all the applicable provisions of ASTM C 270.

Precautions

Direct contact with wet cement should be avoided. If contact occurs, the skin should be washed with water as soon as possible. Exposure can cause serious, potentially irreversible tissue destruction in the form of chemical (caustic) burns. If cement gets into the eyes, immediately rinse thoroughly with water and seek medical attention. For more information, reference the applicable Lafarge Material Safety Data Sheet (MSDS). The MSDS should be consulted prior to use of this product and is available upon request and online at www.lafarge-na.com.

Limited Warranty

Lafarge warrants that Lafarge Masonry Cement meets the requirements of ASTM C 91. Lafarge makes no other warranty, whether of merchantability or fitness for a particular purpose with respect to Lafarge Masonry Cement. Having no control over its use, Lafarge will not guarantee finished work in which Lafarge Masonry Cement is used.



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