



# Masonry & Mortar Cements

What keeps it together,  
is what sets us apart



# MASONRY CEMENT

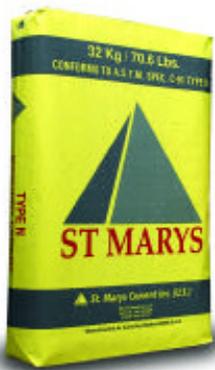
St Marys Masonry Cement is a hydraulic cement produced specifically for use in mortar for unit masonry construction. Intergrinding of portland cement clinker with plasticizers in the production of St Marys Masonry Cement provides excellent plasticity, water retention and air entrainment. An adequate level of air entrainment enhances the freeze-thaw durability of mortar, which is important in the climate of the Great Lakes region.

## SPECIFICATIONS

Masonry cement mortars may be specified by either the proportion or property method of ASTM C270 "Standard Specification for Mortar for Unit Masonry". Type N mortar prepared according to ASTM C270 Table 2 "Proportion Specification Requirements" (A) will meet most requirements in the TMS-402/602, Masonry Building Code. A good rule of thumb is to use a Type N mortar unless there is a structural reason to use a higher strength mortar. For veneer, Type N is often the best choice. Structural masonry, heavier loads or higher seismic areas may require higher strength mortars.

Alternatively, mortars may be specified by property requirements as in Table 1 (B), laboratory prepared mortars. When neither the property or proportion specifications are specified, the proportion specification shall prevail.

Appendix XI.1 of ASTM C270 provides a non-mandatory guide for the selection of masonry mortars for various locations and building segments. Selection of mortar type should also be based on the type of masonry units to be used as well as the applicable building code and engineering practice standard requirements, such as allowable design stresses and lateral support.



**ASTM C270 Table 2. Proportion Specification Requirements for Masonry Cement Mortars**

**A**

Type	Cement	Mortar Cement			Aggregate Ratio (Measured in damp, loose conditions)
		M	S	N	
M	1			1	Not less than 2 <sup>1/4</sup> and not more than 3 times the sum of the separate volumes of cementitious materials.
M		1			
S	1/2			1	
S			1		
N				1	
O				1	

**ASTM C270 Table 1. Property Specification Requirements for Masonry Cement Mortar**

**B**

Type	Average Compressive Strength at 28 days Min. psi / MPa	Water Retention Min. %	Air Content Max. %	Aggregate Ratio (Measured in damp, loose conditions)
M	2500 / 17.2	75	18	Not less than 2 <sup>1/4</sup> and not more than 3 <sup>1/2</sup> times the sum of the separate volumes of cementitious materials
S	1800 / 12.4	75	18	
N	750 / 5.2	75	20 <sup>d</sup>	
O	350 / 2.4	75	20 <sup>d</sup>	

a. Laboratory prepared mortar only.

d. When the structural reinforcement is incorporated, the maximum air content of Masonry Cement Mortar shall be 18%.

**ASTM C270 (XI.1) Guide for the Selection of Masonry Mortar**

Location	Building Segment	Recommended	Alternative
Exterior, above grade	load-bearing wall	N	S or M
	non-load-bearing wall	O <sup>B</sup>	N or S
	parapet wall	N	S
Exterior at or below grade	foundation wall, retaining wall, manholes, sewers, pavements, walks & patios	S	M or N <sup>C</sup>
Interior	load-bearing wall	N	S or M
Interior or Exterior	non-load-bearing wall	O	N
	tuck pointing	see Appendix X3	see Appendix X3

<sup>A</sup>This table does not provide for many specialized mortar uses, such as chimneys, reinforced masonry, and acid-resistant mortars.

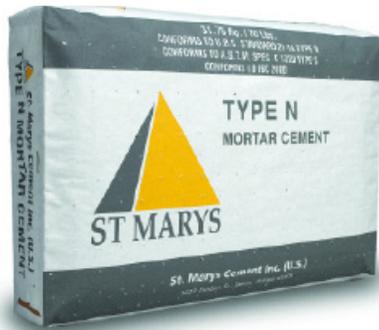
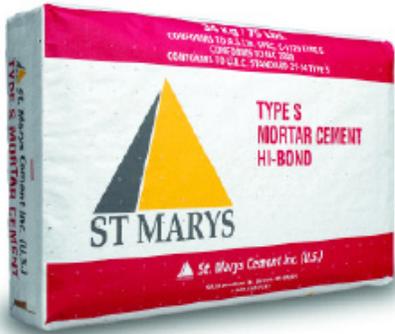
<sup>B</sup>Type O mortar recommended for use where the masonry is unlikely to be frozen when saturated or unlikely to be subjected to high winds or other significant lateral loads. Type N or S mortar should be used in other cases.

<sup>C</sup>Masonry exposed to weather in a normally horizontal surface is extremely vulnerable to weathering. Mortar for such masonry should be selected with due caution.

Note: This table does not provide for many specialized mortar uses, such as chimney reinforced masonry and acid-resistant mortars.

# MORTAR CEMENT

St Marys Mortar Cement is a higher bond strength cement for use in mortar for unit masonry construction. Mortar cements were specifically developed to provide comparable bond and compressive strengths to Portland Cement-Lime mortars, yet maintain the excellent workability and durability of masonry cement mortars. St Marys Mortar Cements meet all requirements of ASTM C1329 - Standard Specification for Mortar Cement.



St Marys Mortar Cements meet the requirements of the following building codes; TMS 402/602, IBC, and MBC

Mortar cement mortars may be specified by either the proportion or property method of ASTM C270.

**ASTM C1329 Table 1**  
**Physical Requirements of Mortar Cement**

	Type N	Type S	Type M
Flexural bond strength 28 days, min. MPa [psi]	0.5 [70]	0.7 [100]	0.8 [115]
Air Content of Mortar:			
Min. volume %	8	8	8
Max volume %	21	19	19

**ASTM C270 Table 2. Proportion Specification**  
**Requirements for Masonry Cement Mortars**

Type	Average Portland Cement	Mortar Cement			Aggregate Ratio (Measured in damp, loose conditions)
		M	S	N	
M	1			1	Not less than 2 <sup>1/4</sup> and not more than 3 times the sum of the separate volumes of cementitious materials.
M		1			
S	1/2			1	
S			1		
N				1	
O				1	

Mortar Cement conforming to the requirements of ASTM C1329.

Note: Two air entraining agents shall not be combined in mortar

**ESTIMATED REQUIREMENTS FOR 105 FT<sup>2</sup>**  
**AREA USING TYPE N OR TYPE S MORTARS**

Unit Type	No. of Units	No. of Masonry Bags	lb Sand
Block	125	3 to 4	550 to 1000
Brick	420-525	3 to 4	770 to 1000

**ASTM C270 Table 1. Property Specification**  
**Requirements for Masonry Cement Mortar**

Type	Average Compressive Strength at 28 days Min. psi/ MPa	Water Retention Min. %	Air Content Max. %	Aggregate Ratio (Measured in damp, loose conditions)
M	2500 / 17.2	75	12	Not less than 2 <sup>1/4</sup> and not more than 3 <sup>1/2</sup> times the sum of the separate volumes of cementitious materials
S	1800 / 12.4	75	12	
N	750 / 5.2	75	14 <sup>c</sup>	
O	350 / 2.4	75	14 <sup>c</sup>	

a. Laboratory prepared mortar only.

d. When the structural reinforcement is incorporated, the maximum air content of Masonry Cement Mortar shall be 12%.

# THE DESIRABLE PROPERTIES OF ST MARYS MASONRY CEMENT AND MORTAR CEMENT MORTARS

## WORKABILITY

Proper workability is easily recognized by the mason from the manner in which the mortar leaves his trowel. A mortar is considered to be workable when its consistency is such that it spreads easily and yet is not so fluid that it readily flows out of the mortar joints. A workable mortar will also readily adhere to vertical surfaces and to the underside of horizontal



## WATER RETENTION

A mortar with good water retention resists rapid loss of mixing water when the mortar is spread in contact with absorptive masonry units. Rapid removal of water causes the mortar to stiffen quickly, thereby making it practically impossible to obtain good bond and weather-tight joints. A mortar that has good water retention remains soft and plastic long enough for the masonry unit to be carefully aligned, leveled, plumbed and adjusted to proper grade without danger of breaking the intimate contact and bond between the mortar and the units.

## BOND STRENGTH

Bond is the property of a hardened mortar that ties masonry units together. The strength of the bond is affected by a number of factors such as: kind and quality of cementitious material; the quality of workmanship in making the joints, the workability and water retention of the mortar; the surface texture of the mortar bedding areas and the rate of suction of the masonry units.

## STRENGTH & DURABILITY

The strength and durability of mortar depends largely on the kind and quantity of cementitious material used in it. ASTM C270 recommends that, unless stated otherwise, a mortar of lower known compressive strength, that meets specification, shall be used. Ideally the mortar should be weaker than the masonry units so that in the event that cracks occur, they will appear in the mortar joints where they can be easily repaired.

## SUSTAINABILITY

St Marys masonry cements contain interground limestone for water retention and workability instead of hydrated lime. This significantly reduces the embodied energy and carbon footprint of the cementitious portion for mortar. The carbon footprint of mortars produced with St Marys masonry cement and mortar cement is approximately 60% and 40% less, respectively, compared to mortars produced from Portland Cement-Lime material combinations.



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For more information on [Environmental Product Declarations \(EPD's\)](#), [Safety Data Sheets](#), and [Product Data Sheets](#), contact your sales or technical services representative, or visit the St Marys Cement website at [www.stmaryscement.com](http://www.stmaryscement.com).



**St Marys Cement**