Masonry Cements

What keeps it together,
is what sets us apart

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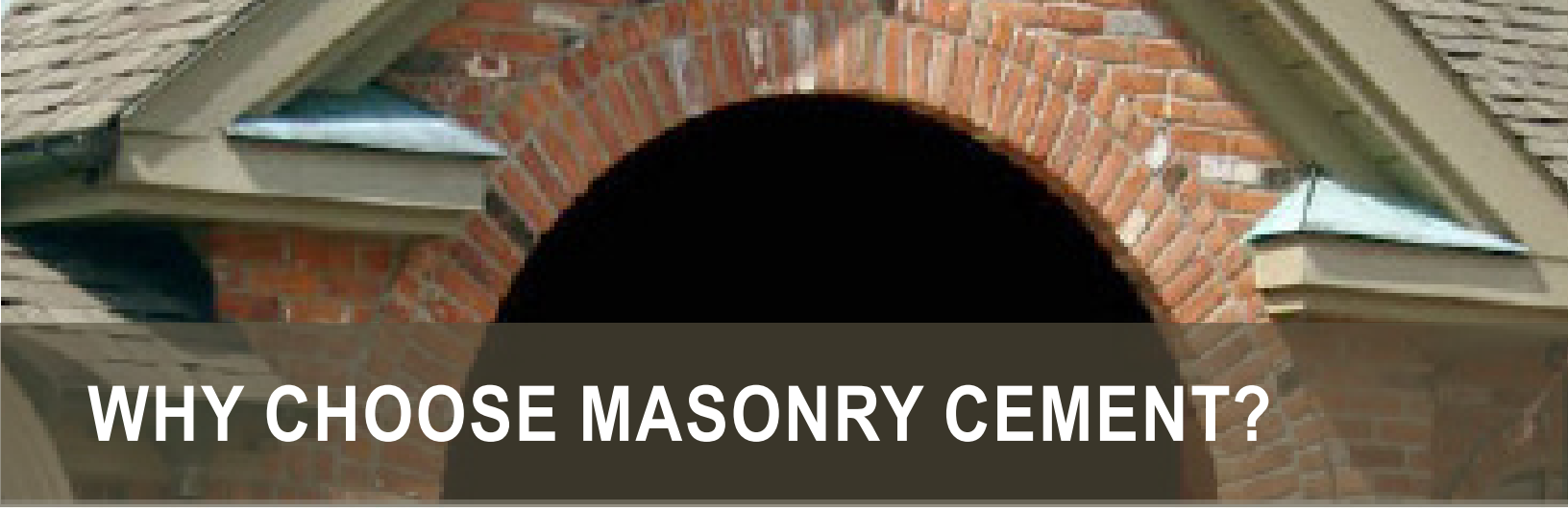

WHY CHOOSE MASONRY CEMENT?

IT'S ALL ABOUT WORKING TOGETHER.

The best guarantee of a good masonry project is a good mason. Good masons appreciate good materials and St Marys Masonry Cements are some of the best. They are hydraulic cements produced specifically for use in mortar for unit masonry construction and they always meet the requirements of CSA A3002 "Masonry and Mortar Cement".

MORTAR

Mortar is the binder in every masonry project, but it is much more. It is a spacer, a leveling method, a means of maintaining plumb and, most importantly, a method of closing the joints and preventing water penetration. A good mortar is all of these and exhibits a number of crucial properties to satisfy the needs of the mason.

WORKABILITY

St Marys Masonry Cements provide excellent workability by:

- spreading easily off the trowel onto bed joints
- adhering to vertical head joints and even the underside of horizontal surfaces
- having good cohesion when extruded from the mortar joint
- firmly supporting the weight of the unit

WATER RETENTION

St Marys Masonry Cements have a high level of water retention ensuring that they:

- will not stiffen prematurely when in contact with the absorptive masonry units allowing good bond development and weather-tight joints
- remain soft and plastic longer so that masonry units can be properly placed
- have a long board life, reducing the need for retempering the mortar

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BOND STRENGTH

St Marys Masonry Cements help ensure a strong bond after the mortar has hardened. Mortar composition is vital to establish bond strength. Mortars made with St Marys Masonry Cements provide the mason with highly plastic mortar, which readily flows into surface irregularities ensuring that the bond strength potential of the materials are realized in the field.

STRENGTH & DURABILITY

Two strengths of masonry cement for two different uses, each providing excellent resistance to freeze thaw deterioration, drying shrinkage and water absorption.

Moderate strength St Marys Type N is acceptable for general use such as exposed non load-bearing masonry walls, above grade plain masonry and for tuck-pointing.

Where a higher compressive strength is required, such as for parging, foundation walls and walls designed with reinforcement, a stronger more durable cement such as St Marys Type S Masonry Cement is recommended.

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 of mortar. The carbon footprint of mortar produced with St Marys masonry cement is approximately 50% less than mortar produced with Portland Cement-Lime.

IT'S ALL IN THE LETTERS.

The best mortar is made with accurately measured ingredients. The following are recommended mortar mixes for use with St Marys Masonry Cements. Proportion Specifications, by volume, for the two mortar types recognized in CSA Standard A179 "Mortar and Grout for Unit Masonry" are:

N

- 1 part Type N Masonry Cement
- 3 parts damp loose brick sand
- enough water for the desired workability

S

- 1 part Type S Masonry Cement
- 3 parts damp loose brick sand
- enough water for the desired workability

OR

- 1/2 part Portland Cement
- 1 part Type N Masonry Cement
- 3 1/2 to 4 1/2 parts damp loose brick sand
- enough water for the desired workability

ESTIMATED REQUIREMENTS FOR 10 M² AREA USING TYPE N OR TYPE S MORTARS

Unit Type	No. of Units	No. of Masonry Bags	Kg Sand
Block	125	3 to 4	250 to 450
Brick	420-525	3 to 4	350 to 450

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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 retentivity and air entrainment. An adequate amount of air entrainment enhances the freeze-thaw durability of hardened mortar, a very important property in the climate of the Great Lakes region.

SPECIFICATIONS

Masonry Cement mortars may be specified by either the proportion specifications (Table 4) or the property specifications (Table 6) as stated in CSA A179 "Mortar and Grout for Unit Masonry". Please note that as per CSA A179, proportion specifications provide the normal acceptance criteria for mortar. Unless otherwise specified by the designer, the basis for acceptance shall be the proportion specifications. CSA A179 Annex A Table A.1 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 used as well as the applicable building code and engineering practice standard requirements, such as allowable design stresses and lateral support.

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CSA A179 - TABLE 4 - Proportion Specifications: Mortar proportions by volume: mortar cement or masonry cement mortars*

Mortar Type	Parts by Volume: Cement*	Mortar or masonry cement, Type N	Mortar or masonry cement, Type S	Aggregate measured in damp, loose state
N	0	1	-	2 1/4 to 3
S	1/2	1	-	3 1/2 to 4 1/2
S	0	-	1	2 1/4 to 3

** Portland, Portland-limestone, or blended cement*

Notes:
1) See Annex A for guidelines on mortar selection.
2) In accordance with Clause 6.1.3, as the basis for proportioning, 1 m^3 of damp, loose sand contains 1280 kg of dry, loose sand.

CSA A179 - TABLE 6 - Property Specifications: Compressive strength of mortar cubes

Preparation	Mortar Type	Minimum Compressive Strength, MPA: 7 d test	28 d test
Job prepared or manufactured off-site in a batching plant, mixed to a flow suitable for use in laying masonry units	N	2	3.5
	S	5	8.5
Laboratory prepared, mixed to a flow of 110% ± 5%	N	3	5
	S	7.5	12.5

Notes:
1) The age at test, i.e. 7 or 28 d, is the length of time since the fresh mortar was sampled.
2) The minimum compressive strength requirements for laboratory-prepared, job prepared, and off-site-prepared mortars differ, the requirements for the latter two normally being approximately 2/3 of the requirements for laboratory-prepared mortars. Laboratory-prepared mortars are mixed with a quantity of water to produce a flow of 110% ± 5%. This quantity of water generally is not sufficient to produce a mortar with a workable consistency suitable for laying masonry units in the field. Flow values of 130% to 150% are common for mortar in construction. To provide sufficient water to satisfy the suction of masonry units, mortar for use in the field is mixed with a maximum amount of water consistent with workability. Because construction mortar contains more water, compressive strength values for job-prepared mortars or mortars manufactured off-site in a batching plant can therefore normally be expected to be less than those for laboratory-prepared mortar. The strength of laboratory-prepared mortar is intended to appoximate that of field-prepared mortar after it has been placed and unit suction has been satisfied.
3) Ready-mixed mortar should be tested only at 28 d. The 7 d test results can be affected by the extended-life admixture
4) For information on accelerated curing and mortar cube testing at 24 h, see Note 3) of Clause 8.4.1
5) See Annex B for guidance on testing.

CSA A179 - Annex A - TABLE A.1 Guide for the selection of mortars for modern unit masonry

Locations	Building Segment	Recommended Mortar Type
Exterior above grade †	Load-bearing walls requiring high compressive strength	S
	Load-bearing walls requiring low compressive strength	N
	Non-load-bearing walls	N
	Parapet walls and masonry subject to high saturation levels such as chimneys and freestanding boundary walls	S*
Exterior at or below grade †	Foundation walls, retaining walls, manholes, sewers, pavements, walks, and patios	S*
Interior	Load-bearing walls requiring high compressive strength	S
	Load-bearing walls requiring low compressive strength	N
	Non-load-bearing partitions	N

** Air-entrainment improves the freeze-thaw resistance of the mortar both in the plastic and the hardened state.*
† Masonry exposed to weather in a nominal horizontal surface is extremely vulnerable to weathering. Mortar for such masonry should be selected with care.

Notes:
1) This Table does not cover specialized mortars such as high-bond and acid-resistant mortars.
2) Alternatives to the mortar types recommended above might be more appropriate in specific cases. See Clause A.1 and ASTM C270 for additional information. Annex D gives guidance on repair mortars for older masonry. Only mortar Types S and N are specified in this Standard and recognized in CSA S304.

GROUT SPECIFICATIONS

Masonry grout, which can be made by incorporating St Marys Portland cement or Portland-limestone cement, water, and aggregates, is most often used in conjunction with steel reinforcement in masonry walls. Grouts may be specified by either the proportion specifications (Table 5) or the property specifications (Table 7) as stated in CSA A179 "Mortar and Grout for Unit Masonry". Please note that as per CSA A179, proportion specifications provide the normal acceptance criteria for grouts. Unless otherwise specified by the designer, the basis for acceptance shall be the proportion specifications.

CSA A179 - TABLE 5 - Proportion Specifications: Grout proportions by volume

	Parts by Volume (aggregate measured in damp, loose state)			
Grout Type	**Cement***	**Lime †**	**Fine aggregate**	**Coarse aggregate**
Fine	1	0 to 1/10	2 1/4 to 3 times the sum of the cementitious materials	0
Coarse	1	0 to 1/10	2 1/4 to 3 times the sum of the cementitious materials	1 to 2 times the sum of the cementitious materials

** Portland, Portland-limestone, or blended cement.*
† Lime can be in the form of hydrated lime or lime putty.

Notes:
1) A superplasticizer may be used to assist with placement of grout, in which case the requirements of Clause 5.5.1.4 shall be satisfied.
2) In accordance with Clause 6.1.3, as the basis for proportioning, 1 m^3 of damp, loose sand (fine aggregate) contains 1280 kg of dry, loose sand, and 1 m^3 of damp, loose, coarse aggregate contains 1400 kg of dry, loose, coarse aggregate.
3) Lime putty can contain significantly more lime than dry hydrated lime of the same volume. If lime putty is used in place of hydrated lime the designer shall accommodate for the difference in lime content if applicable.

CSA A179 - TABLE 7 - Property Specifications Grout compressive strength

	Minimum compressive strength, MPa		
Grout Type	**7 d test**	**28 d test**	**Consistency when sampled**
Fine	6.0	10.0	**Suitable for use in grouting masonry**
Coarse	7.5	12.5	

Notes:
1) A superplasticizer may be used to assist with placement of grout, in which case the requirements of Clause 5.5.1.4 shall be satisfied.
2) A fluid grout shall be required for placement, with excess water to ensure that a sufficient amount of moisture is present to replace moisture lost through absorption into the surrounding masonry and to ensure complete hydration.
3) For other than self-consolidating grout, requirements for placement and fluidity generally necessitate the use of a high slump grout, on the order of 275 mm, with a high water/cement ratio.
Because of moisture absorption into the surrounding masonry, the in-wall compressive strength for such grout is generally about 50% higher than the compressive strength indicated for grout of the same type that experiences no moisture loss when cast in non-absorbent cylinder moulds. For tests of the compressive strength of grout cast in non-absorbent cylinder moulds, the minimum average 28 d compressive strengths required by this table are recognized by CSA S304 and lead to satisfactory structural performance.

PARGING

The consistency and enhanced workability of St Marys Type S Masonry Cement make it the ideal choice for parging. Parging can be used as a basecoat for damp-proofing concrete block and poured concrete walls, or can even be used to provide a more aesthetically pleasing and smooth appearance. Parging, which consists of a cementitious material, sand, and water, can be applied as a 1, 2, or 3 coat system. A common parging mix would consist of 1 part St Marys Type S Masonry Cement and 3 parts damp loose sand by volume, and enough water for the desired workability. For example, 1 St Marys Type S bag and 3 parts damp loose sand by volume, would give enough mortar to cover approximately 7.67 square metres @ 6 mm thick (78 square feet @ ¼" thick).

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St Marys Cement has an experienced technical services department ready to provide assistance regarding the use of Masonry Cement in Masonry construction.

For more information or specific needs such as 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.

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