



CONTRACTOR'S ALERT – 2020.11

SPECIFYING MORTAR



It is often said that mortar is one of the most misunderstood components of masonry. Even though the perception of mortar is simple, the manner in which it is specified can become convoluted to the extent that project documents may conflict with the requirements of the mortar Standard, ASTM C270.

ASTM C270-19a, *Standard Specification for Mortar for Unit Masonry*, Section 1.2, contains a statement which provides clear guidance on specifying mortar. Note that the word 'or' makes the proportion/property requirements mutually exclusive.

1.2 The proportion or property specification shall govern as specified.

Choose Only One

Mortar	Type	Min. 28 day Compressive Strength, psi	Water Retention Min %	Air content Max %	Aggregate Ratio/Damp, Loose
Cement-Lime	M	2500	75	12	Not less than 2 1/4 and not more than 3 1/2 times the sum of the separate volumes of cementitious materials
	S	1800	75	12	
	N	750	75	14	
	O	350	75	14	
Mortar Cement	M	2500	75	18	
	S	1800	75	18	
	N	750	75	20	
	O	350	75	20	
Masonry Cement	M	2500	75	18	
	S	1800	75	18	
	N	750	75	20	
	O	350	75	20	

TABLE 2-Proportion Specification Requirements									
	Proportions by Volume (Cementitious Materials)								Aggregate Ratio/Damp Loose
Type	Cement	Mortar Cement			Masonry Cement			Hydrated Lime	
		M	S	N	M	S	N		Not less than 2-1/4 and not more than 3 times the sum of the separate volumes of cementitious materials
M	1	--	--	--	--	--	--	1/4	
S	1	--	--	--	--	--	--	Over 1/4 to 1/2	
N	1	--	--	--	--	--	--	Over 1/2 to 1-1/4	
O	1	--	--	--	--	--	--	Over 1-1/4 to 2-1/2	
M	1	--	--	1	--	--	--		
M	--	1	--	--	--	--	--		
S	1/2	--	--	1	--	--	--		
S	--	--	1	--	--	--	--		
N	--	--	--	1	--	--	--		
O	--	--	--	1	--	--	--		
M	1	--	--	--	--	--	1		
M	--	--	--	--	1	--	--		
S	1/2	--	--	--	--	--	1		
S	--	--	--	--	--	1	--		
N	--	--	--	--	--	--	1		
O	--	--	--	--	--	--	1		

Tip: When specifying mortar do not combine Proportions and Properties. Choose either Proportions or Property, not both. Be aware that field-tested mortar is not expected to meet compressive strength property values of Table 1.

ASTM C270 goes on to thoroughly explain why field-tested mortars are not expected to meet Table 1 Compressive strength requirements.

1.4 This standard is not a specification to determine mortar strengths through field testing (see Section 3).

3.3 Since the compressive strength values resulting from field tested mortars do not represent the compressive strength of mortar as tested in the laboratory nor that of the mortar in the wall, physical properties of field sampled mortar shall not be used to determine compliance to this specification and are not intended as criteria to determine the acceptance or rejection of the mortar.

8.3 Test Method C780 is suitable for the evaluation of masonry mortars in the field. However, due to the procedural differences between Specification C270 and C780, the compressive strength values resulting from field sampled mortars are not required nor expected to meet the compressive strength requirements of the property specification of Specification C270, nor do they represent the compressive strength of the mortar in the wall.

Two major reasons compressive strength of field-tested mortar does not represent mortar strength in the joint:

- Curing of mortar in a non-absorbent specimen container is not the same as mortar curing in the masonry wall. In the masonry wall, excess water is absorbed by the masonry units.
- The aspect ratio (width to height) causes the mortar to be much stronger than in a test mold.

Verification of quantities for mortar specified by proportion is appropriate, but testing for compressive strength is not required and should never be a condition for acceptance.

Tip: For improved Quality Control, more Pre-Mixed or Factory-Blended mortar is being used for masonry construction. Factory-Blended mortar that is certified to ASTM C1714, Standard Specification for Preblended Dry Mortar Mix for Unit Masonry, fully complies with the requirements of ASTM C270.

Industry Representatives



John Chrysler
Masonry Institute of America
(310) 257-9000
jc@masonryinstitute.org



Kurt Siggard
Concrete Masonry
Association of CA & NV
(916) 722-1700
kurt@cmacn.org



Rod Haraga
Masonry Institute of Hawaii
(808) 782-8661
rhara@mih@gmail.com