

FACT SHEET: HYDRATED LIME FOR MASONRY PURPOSES

Hydrated Masons Lime Characteristics

Type S (Special) hydrated lime is a fine, white, high purity product which has been specially hydrated for convenient, trouble-free use. Type SA (Special Air-Entrained) hydrated lime is similar to Type S, except it includes an air entraining agent which produces minute voids in the mixed mortar. Either type when properly combined with cement and sand will provide a superior quality mortar. Type S and type SA hydrated lime are defined by the ASTM C 207 Standard Specification (Hydrated Lime for Masonry Purposes).

Typical physical and chemical requirements for Type S hydrated lime as defined by ASTM C207 are given in Table 1.

TABLE 1

CHEMICAL PROPERTIES	TYPE S and SA
Calcium and Magnesium Oxides (non-volatile basis, min. %)	95
Carbon dioxide (as received basis), max. % if sample taken at manufacturer if sample taken elsewhere	5 7
Unhydrated Oxides (as received basis), max. %	8
PHYSICAL PROPERTIES	
Plasticity (Emley), min.	200
Water Retention, min. %	85
Retained on No. 30 (600 um) mesh, max. %	0.5
Approximate Bulk or Packed Density (lbs./ft. ³)	40
Air Content Type S hydrated lime:sand mortar, max. % Type SA hydrated lime: sand mortar, max. %	7 14

Type S and SA hydrated lime is packaged in 50 lb. (22.7 kg) multiwall paper bags or can be obtained in pneumatic trailer quantities.

Portland Cement or Blended Cement/Lime (CL) Masonry System Design

Type S hydrated lime is a key ingredient in constructing durable, water-tight masonry. In particular, Type S hydrated lime improves mortar bond to masonry units (brick, concrete block and stone). Bond strength is important in design considerations in the prevention of cracking, water leakage, and efflorescence.

Cement-lime mortars are the standard mortar of ASTM C 270. Mortars can be mixed by volume proportion of cement, lime and sand or by the property of the resulting mortar. Field mixed mortars use the proportion approach and preblended mortars use the property approach. Mortars mixed by the proportion method have a higher compressive strength than property-specified mortars (Table 2).

Table 2
ASTM C 270 Standard Specification for Mortar for Unit Masonry

Proportion Specification (Typical Laboratory Test Data)				Property Specification* (Requirements)	
Mortar Designation	Volume Proportions (cement:lime:sand)	Compressive Strength 28 days (psi)	Water Retention (%)	Compressive Strength 28 days (psi)	Water Retention (%)
O	1:2:9	750	90	350	75
N	1:1:6	1500	85	750	75
S	1:½:4½	2200	80	1800	75
M	1:¼:3¾	2800	75	2500	75

*not applicable to field materials and conditions.

Mortar strength should not exceed the strength of the masonry units. Table 3 is a general guide for CL mortar selection. Other factors to be considered include type and absorption of masonry unit, applicable building code, and engineering requirements such as allowable design stresses. Type S lime will improve water retention of mortar. High water-retentive mortars are desirable for use with high absorption units such as concrete block.

Table 3
Recommended Guide for Selection of Mortar Type

Exterior, above grade, load-bearing	N
Exterior, above grade, non-load-bearing	O
Exterior, above grade, parapet walls	N
Exterior, at or below grade	S
Interior, load bearing	N
Interior, non-load bearing	O

