

Get Ready for New CMU Strength Provisions

Industry effort over the past several years to recognize improved manufacturing techniques, and quality control, has culminated with significant changes to our concrete masonry codes and standards. These changes will help make concrete masonry construction more competitive and allow for efficient use of materials.

ASTM C90 has a significantly changed strength requirement. The 2014 version now has a minimum net area compressive strength requirement of 2,000psi (average of three units), and 1,800psi for individual units. Most materials produced in California and Nevada well exceed these new minimum strength requirements. Those producers certifying to the “current ASTM” will want to identify this new strength provision in all their test reports and documentation (both printed and on-line). See Table below for more details

Table 2 Strength , Absorption, and Density Classification Requirements

Density Classification	Oven-Dry Density of Concrete, lb/ft ³ (kg/m ³)	Maximum Water Absorption, lb/ft ³ (kg/m ³)		Minimum Net Area Compressive Strength, lb/in ² (MPa)	
		Average of 3 Units	Average of 3 Units	Individual Units	Average of 3 Units
Lightweight	Less than 105 (1680)	18 (288)	20 (320)	2000 (13.8)	1800 (12.4)
Medium Weight	105 to less than 125 (1680-2000)	15 (240)	17 (272)	2000 (13.8)	1800 (12.4)
Normal Weight	125 (2000) or more	13 (208)	15 (240)	2000 (13.8)	1800 (12.4)

TMS 402/602-13 will be the reference masonry code for the 2014 ICC; the 2014 ICC will be the model code for the 2015 California Building Code. The Unit Strength Table (see below) has been significantly modified. The code will now encourage design professionals to use a design f'_m of 2,000psi (rather than the traditional 1,500psi). Notice in the table that a concrete masonry unit will only need to meet the minimum requirements of ASTM C90 to be used in a project with a design f'_m of 2,000psi. Traditional “Ultra-High Strength” materials commonly produced for projects designed with an f'_m of 2,500psi will only need to meet a compressive strength requirement of 3,250psi (rather than the traditional 3,750psi).

Table 2 - Compressive Strength of Masonry based on the compressive strength of concrete masonry units and type of mortar used in construction

Net area compressive strength of concrete masonry, psi (MPa)	Net area compressive strength of concrete masonry units, psi (MPa)	
	Type M or S mortar	Type N mortar
1,700 (11.72)	---	1,900 (13.10)
1,900 (13.10)	1,900 (13.10)	2,350 (14.82)
2,000 (13.79)	2,000 (13.79)	2,650 (18.27)
2,250 (15.51)	2,600 (17.93)	3,400 (23.44)
2,500 (17.24)	3,250 (22.41)	4,350 (28.96)
2,750 (18.96)	3,900 (26.89)	---
3,000 (20.69)	4,500 (31.03)	---

¹For units of less than 4 in. (102 mm) nominal height, sue 85 percent of the values listed.