

[ BLOCK BITE ]

# SPECIFYING FIRE RESISTANCE RATINGS

for Concrete Masonry Construction

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Building codes take a multifaceted approach to protecting life and property during a fire. These requirements address the combustibility, flame spread, smoke release, and structural stability of the systems that are used to mitigate the occurrence and spread of fire within buildings while allowing the safe evacuation of occupants. The inherent attributes of concrete masonry make it an ideal choice in meeting and exceeding the minimum building code requirements.<sup>1</sup>

## DETERMINING FIRE RESISTANCE RATINGS

In accordance with the International Building Code<sup>2</sup>, the fire resistance of concrete masonry assemblies can be determined through one of multiple compliance options. **These include:**

- **PHYSICAL EVALUATION** in accordance with ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials<sup>3</sup>.
- **CALCULATED** fire resistance determined in accordance with Section 722 of the IBC. The calculated fire resistance method is an adaptation of the standard ACI/TMS 216.1<sup>4</sup>, *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*.
- **PRESCRIPTIVE DETAILING** requirements in accordance with Section 721 of the IBC or a listing service<sup>5</sup>.
- **ALTERNATIVE MODELING OR DESIGNS** based upon engineering analyses or alternative sources of documentation, research or testing.

The calculation method for determining the fire resistance rating of concrete masonry assemblies is by far the most common because it allows a nearly limitless combination of unit sizes and configurations, combined with an array of aggregate types used in producing the concrete masonry units.

### References:

- [1] CMHA TEK 07-01D, Fire Resistance Ratings of Concrete Masonry Assemblies, Concrete Masonry & Hardscapes Association, [www.masonryandhardscapes.org](http://www.masonryandhardscapes.org).
- [2] International Building Code (IBC), 2024, International Code Council, [www.iccsafe.org](http://www.iccsafe.org).
- [3] ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials, ASTM International, [www.astm.org](http://www.astm.org).
- [4] ACI/TMS 216.1-14(19), Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies, The Masonry Society, [www.masonrysociety.org](http://www.masonrysociety.org).
- [5] CMU-FAQ-015-23, What Is the Difference Between Fire Resistance Ratings for Masonry Assemblies Obtained Through the IBC vs. a Listing Service Such as UL or FM?, Concrete Masonry & Hardscapes Association, [www.masonryandhardscapes.org](http://www.masonryandhardscapes.org).

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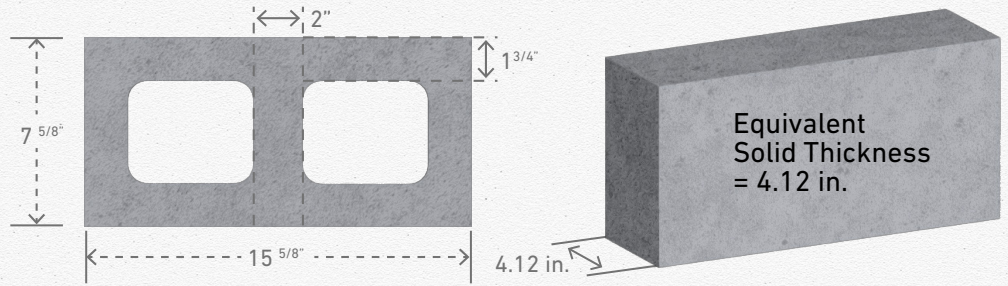
# BEST PRACTICES FOR SPECIFYING FIRE RESISTANCE RATINGS

The calculated fire resistance rating is a function of two variables:

1. The equivalent thickness of the CMU.
2. The type(s) of aggregate used in the production of the CMU.

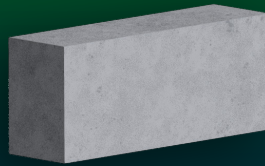
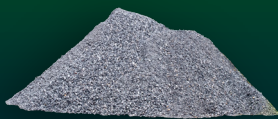
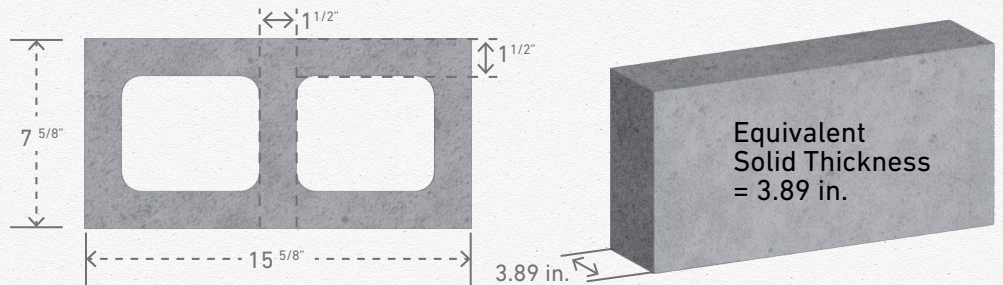
Because neither may be known to the designer during the early phases of design, it is best practice to simply specify the required fire resistance rating. Doing so ensures the lowest-cost options for a given market are leveraged for each project.

Hollow Thickness = 7 5/8 in.



Examples of different unit configurations that affect the equivalent thickness.

Hollow Thickness = 7 5/8 in.



**AGGREGATE TYPE + EQUIVALENT THICKNESS OF CMU = FIRE RESISTANCE**

Concrete masonry units offer a variety of solutions to meet — and exceed — fire code, making it an ideal solution for firewalls, stairwells, elevator shafts, garages, utility rooms and multi-family construction.

## Available Fire Resistance Ratings Based on Nominal CMU Thickness (hour)

Nominal Unit Thickness (in.)	Typical Hollow Unit	Solid or Solid Grouted Unit
4 in. CMU	1 to 1.5 hours	1.5 to 2.5 hours
6 in. CMU	1.25 to 2 hours	3.25 to 4 hours
8 in. CMU	1.75 to 3 hours	4 hours
10 in. CMU	2.25 to 3.75 hours	4 hours
12 in. CMU	2.75 to 4 hours	4 hours