Concrete Block are commonly referred to as “CMUs” (Concrete Masonry Units), “Grey Block” or simply “Concrete Block.” The following are key terms commonly used to further describe different types of concrete block.

A. Scored/Concave Flute  
B. Stretcher End (Mortar Groove)  
C. Breaker  
D. Sash Groove  
E. Plain End  
F. Rectangular Core  
G. Pear Core  
H. Split Face*  
J. Bullnose (Double shown)

*All split-face masonry units are available in grey and architectural colors.
How to Calculate Fire Ratings for Concrete Block

International Standard Building Code

721.3.2 The fire resistance ratings of walls and partitions constructed of concrete masonry units shall be determined from Table 721.3.2. The rating shall be based on the equivalent thickness of the masonry and type of aggregate used.

*Values between those shown in the table can be determined by direct interpolation.
**Contact producer to verify aggregate and net volume. Certifications provided by each producer member as requested.

<table>
<thead>
<tr>
<th>Type of Aggregate</th>
<th>1.0</th>
<th>2.0</th>
<th>3.0</th>
<th>4.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expanded Shale, Clay**</td>
<td>2.6</td>
<td>3.6</td>
<td>4.4</td>
<td>5.1</td>
</tr>
</tbody>
</table>

Table 721.3.2
Minimum Equivalent Thickness (Inches) of Loadbearing or Nonloadbearing Concrete Masonry Walls*

Thickness shown for concrete masonry is equivalent thickness defined as the average thickness of solid material in the wall and is represented by the the formula:

\[ T_E = \frac{V_n}{L \times H} \]

Where:
- \( T_E \) = Equivalent thickness, in inches
- \( V_n \) = Net volume (gross volume less volume of voids), in cubic inches*
- \( L \) = Length of block, in inches
- \( H \) = Height of block, in inches

Source: ISBC
Compressive Strength of Concrete Masonry (PSI*)

**Comment:** ASTM C-90 is the standard of masonry production specifications in the United States. With the approval of ACI 530.1-88 specifications and the issue of ASTM C-90-91, there is one major specification change to note. In the past, block compressive strength (psi) was based on gross area requiring an average 1000 psi. The strength requirements have not changed but the measurements have. All new specifications now are based on net area of 1900 psi.

To assist you in calculating the net area, please follow the formula below.

Given the gross area compressive strength, you may determine the net area by knowing:

1. percent solids of unit, or
2. equivalent thickness of unit.

### Gross Area to Net Area Conversion

*“Based on average of 3 units 4” height and above*

**Example:** 8" cmu with a known 1100 psi gross area at 52% solids.

\[
\text{Compressive Strength} \times \frac{100}{52\%} = 2115 \text{ psi}
\]

**Example:** 8" cmu (7.625 actual size) with a known 1100 psi gross area with an equivalent thickness of 4.0".

\[
\frac{1100 \text{ psi}}{4.0} \times 7.625 = 2097 \text{ psi}
\]

Block manufacturers have gross-area psi data as well as solids and equivalent strength numbers. Most will have the net-area compressive strength psi with future test results.

### TABLE 1 Minimum Face Shells and Web Requirements

<table>
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<tr>
<th>Nominal Width (W) of Units, in. (mm)</th>
<th>Face Shell Thickness (tfs), min, in. (mm)**</th>
<th>Webs</th>
<th>Normalized Web Area (Anw), min, in.2/ft2 (mm2/m2) **</th>
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<tbody>
<tr>
<td>3 (76.2) and 4 (102)</td>
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</table>

** Average of measurements on a minimum of 3 units when measured as described in Test Methods C140.

** When this standard is used for units having split surfaces, a maximum of 10% of the split surface is permitted to have thickness less than those shown, but not less than ¾ in. (19.1 mm). When the units are to be solid grouted, the 10% limit does not apply and Footnote C establishes a thickness requirement for the entire face shell.

** Minimum normalized web area does not apply to the portion of the unit to be filled with grout. The length of that portion shall be deducted from the overall length of the unit for the calculation of the minimum web cross-sectional area.

### TABLE 2 Strength, Absorption, and Density Classification Requirements

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Dimensions

4-Inch Unit Configurations

6-Inch Unit Configurations

8-Inch Unit Configurations

10-Inch Unit Configurations

12-Inch Unit Configurations
12" Units

12x8x16
Square End Regular

12x8x16
Regular w/Sash

12x8x8
Half w/Sash

12x8x16
Restricted
Open Bottom Lintel

12x8x16
Solid Bottom Lintel

12x8x16
Single Score

12x8x16
Single Bullnose

12x8x16
Double Bullnose
One End

12x8x16
Double Bullnose
One Side

12x8x12
Pilaster
(Call for Availability)

12x8x16
Offset Return Corner
(Call for Availability)

12x8x16
Pilaster
(Call for Availability)

12x8x16
Conduit Block With
Knockout Webs

12x4x16
Half High

12x4x16
Half-High Restricted
Open Bottom Lintel

12x4x16
Half-High
Solid Bottom Lintel
12” Units

- 12x8x16
  - Split Face
- 12x8x16
  - Single Flute
- 12x8x16
  - Open/Solid Bottom Lintel

16” Units

- 16x8x16
  - Pilaster
  - (Call for Availability)
- 16x4x16
  - Pier Pad

Special Units

- 8x8x16
  - Inspection Block
- 12x4x16
  - Half-High Split Face

Notes

- Available With Flutes & Score
- Available

- Single Score Available
Midsouth Region
Sales Office
1-800-338-7902

Gulf Coast Region
Sales Office
1-800-888-9262

Georgia Region
Sales Office
1-866-322-5625