



Technical Bulletin - Brick Fire Ratings

Fire resistance or “ratings” for masonry products are established through a testing program performed in accordance with the American Society for Testing and Materials (ASTM) test method ASTM E119. The results of these tests are readily accepted by all major building code authorities and by the National Fire Protection Association (NFPA). Testing methods and test results are discussed comprehensively in BIA Technical Note 16 as published by the Brick Institute of America.

The significant data on fire resistance relating to General Shale Brick is summarized below.

Minimum Equivalent Thickness¹ (in.) of Loadbearing or Non-Loadbearing Clay Masonry Walls^{2,3,4}

Type of Material	Fire Resistance Period (minutes)			
	60	120	180	240
Solid brick of clay or shale	2.7	3.8	4.9	6.0
Hollow brick of clay or shale, unfilled	2.3	3.4	4.3	5.0
Hollow brick of clay or shale, grouted or filled with perlite, vermiculite, or expanded shale	3.0	4.4	5.5	6.6

¹Equivalent thickness is the average thickness of solid material in the wall. It is found by taking the total volume of a wall unit, subtracting the volume of core or cell space and dividing by the area of the exposed face of the unit.

²Where combustible members are framed in the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93% of the thickness shown in the table.

³Units shall comply with the requirements of ASTM C216 for solid brick and ASTM C652 for hollow brick.

⁴Extracted from the 2018 Edition of The International Building Code, Table 721.1(2)

The equivalent thickness of General Shale Brick units is calculated as follows:

$$\frac{(\text{Length} \times \text{Width} \times \text{Height}) \times \% \text{solid volume}}{(\text{Length} \times \text{Height}) \text{ Face Area}} = \text{Equivalent Thickness (in.)}$$

Values for **Fire Resistance Period** of a unit are interpolated from the table above:

- Engineer Modular Size (E/M)** (7.625 in. x 3.5 in. x 2.75 in.)
 C216 – Equivalent Thickness = 2.7 in. Fire Resistance Period = 60 minutes *
 C652 – Equivalent Thickness = 2.5 in. Fire Resistance Period = 63 minutes *
- Modular Size (M/S)** (7.625 in. x 3.5 in. x 2.25 in.)
 C216 – Equivalent Thickness = 2.7 in. Fire Resistance Period = 60 minutes *
 C652 – Equivalent Thickness = 2.5 in. Fire Resistance Period = 63 minutes *
- Queen Size Modular (Q/M)** (7.625 in. x 2.75 in. x 2.75 in.)
 C216 – Equivalent Thickness = 2.1 in. Fire Resistance Period = 50 minutes *
 C652 – Equivalent Thickness = 1.9 in. Fire Resistance Period = 54 minutes *

*Equivalent Thicknesses and Fire Resistance Periods are calculated using 76% solid volume for C216 units and 71% solid volume for C652 units.