



# Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale)<sup>1</sup>

This standard is issued under the fixed designation C 62; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

## 1. Scope \*

1.1 This specification covers brick intended for both structural and nonstructural masonry where external appearance is not a requirement. The brick are prismatic units available in a variety of sizes, shapes, textures, and colors. The specification does not cover brick intended for use as facing units or where surface appearance is a requirement, (see Specification C 216). This specification does not cover brick intended for use as paving brick (see Specification C 902).

1.2 The property requirements of this standard apply at the time of purchase. The use of results from testing of brick extracted from masonry structures for determining conformance or nonconformance to the property requirements (Section 3) of this standard is beyond the scope of this standard.

1.3 Brick are manufactured from clay, shale, or similar naturally occurring earthy substances and subjected to a heat treatment at elevated temperatures (firing). The heat treatment must develop sufficient fired bond between the particulate constituents to provide the strength and durability requirements of this specification. (See firing, fired bond, and incipient fusion in Terminology C 43.)

1.4 Brick are shaped during manufacture by molding, pressing, or extrusion, and the shaping method is a way to describe the brick (see Terminology C 43).

1.5 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.6 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

## 2. Referenced Documents

### 2.1 ASTM Standards:

C 43 Terminology of Structural Clay Products<sup>2</sup>

C 67 Test Methods for Sampling and Testing Brick and Structural Clay Tile<sup>2</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee C15 on Manufactured Masonry Units and is the direct responsibility of Subcommittee C15.02 on Brick and Structural Clay Tile.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 04.05.

C 216 Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)<sup>2</sup>

C 902 Specification for Pedestrian and Light Traffic Paving Brick<sup>2</sup>

E 835/E 835M Guide for Modular Coordination of Clay and Concrete Masonry Units<sup>3</sup>

## 3. Grades

3.1 Grades classify brick according to their resistance to damage by freezing when wet, as defined in Note 1. Three grades are covered and the grade requirements are shown in Table 1.

3.1.1 *Grade SW (Severe Weathering)*—Brick intended for use where high and uniform resistance to damage caused by cyclic freezing is desired and where the brick may be frozen when saturated with water.

3.1.2 *Grade MW (Moderate Weathering)*—Brick intended for use where moderate resistance to cyclic freezing damage is permissible or where the brick may be damp but not saturated with water when freezing occurs.

3.1.3 *Grade NW (Negligible Weathering)*—Brick with little resistance to cyclic freezing damage but which are acceptable for applications protected from water absorption and freezing.

NOTE 1—The word “saturated,” with respect to this standard, refers to the condition of a brick that has absorbed water to an amount equal to that resulting from submersion in room temperature water for 24 h.

## 4. Physical Properties

4.1 *Appearance*—If brick are required to have a particular color, texture, finish, uniformity, or limits on cracks, warpage or other imperfections detracting from the appearance they are purchased under Specification C 216.

4.2 *Durability*—When Grade is not specified, the requirements for Grade SW shall govern. Unless otherwise specified by the purchaser, brick of Grade SW or MW shall be accepted instead of Grade NW; and Grade SW instead of Grade MW.

4.2.1 *Physical Property Requirements*—The brick shall conform to the physical requirements for the Grade specified as prescribed in Table 1. For the compressive strength requirements in Table 1, test the unit with the compressive force

<sup>3</sup> Annual Book of ASTM Standards, Vol 04.07.

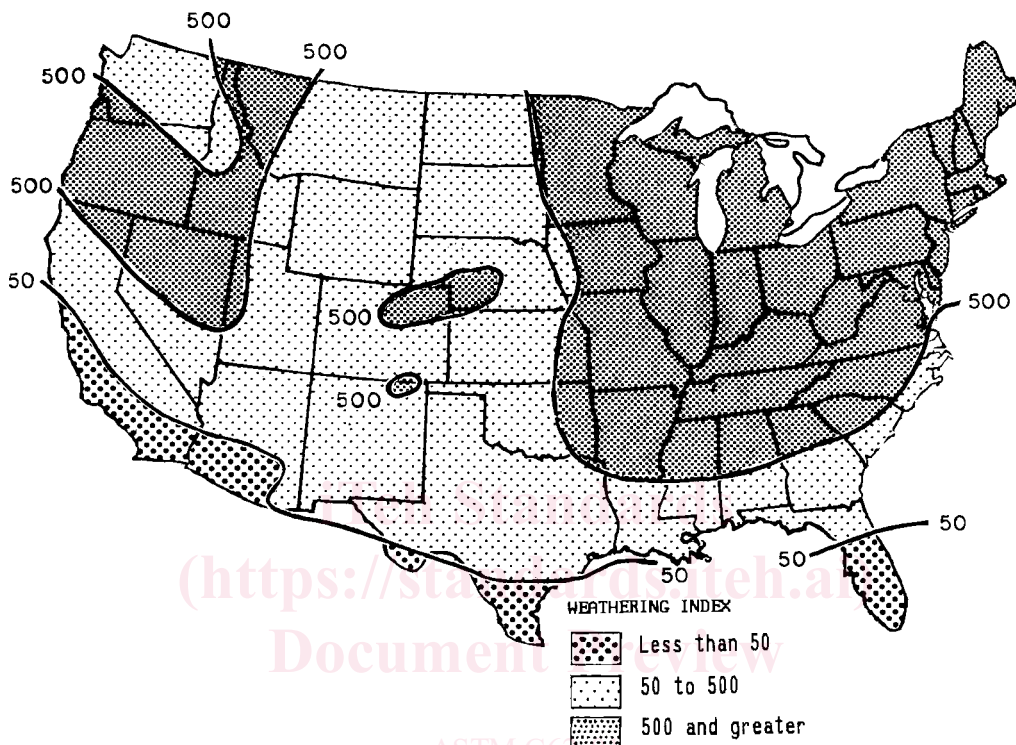
\*A Summary of Changes section appears at the end of this standard.

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**TABLE 1 Physical Requirements**

Designation	Minimum Compressive Strength gross area, psi (MPa)		Maximum Water Absorption by 5-h Boiling, %		Maximum Saturation Coefficient <sup>A</sup>	
	Average of 5 Brick	Individual	Average of 5 Brick	Individual	Average of 5 Brick	Individual
Grade SW	3000 (20.7)	2500 (17.2)	17.0	20.0	0.78	0.80
Grade MW	2500 (17.2)	2200 (15.2)	22.0	25.0	0.88	0.90
Grade NW	1500 (10.3)	1250 (8.6)	no limit	no limit	no limit	no limit

<sup>A</sup> The saturation coefficient is the ratio of absorption by 24-h submersion in cold water to that after 5-h submersion in boiling water.



**FIG. 1 Weathering Indices in the United States**

perpendicular to the bed surface of the unit, with the unit in the stretcher position.

**4.2.2 Absorption Alternate**—The saturation coefficient requirement does not apply, provided the 24-h cold water absorption of each unit of a random sample of five brick does not exceed 8.0 %.

**4.2.3 Freezing and Thawing Alternative**—The requirements for 5 h boiling water absorption and saturation coefficient do not apply, provided a sample of five brick, meeting the strength requirements of Table 1, passes the freezing and thawing test as described in the Rating Section of the Freezing and Thawing test procedures of Test Methods C 67.

**4.2.3.1 Grade SW: Weight Loss Requirement**—Not greater than 0.5 % loss in dry weight of any individual unit.

**NOTE 2**—The 50 cycle freezing and thawing test is used as an alternative only when the brick do not conform to either Table 1 requirements for maximum water absorption and saturation coefficient, or to the requirements of the Absorption Alternate in 4.2.2.

**4.2.3.2 Grade SW: Breakage Requirement**—No individual unit separates into two or more significant pieces.

**4.2.3.3 Grade SW: Cracking Requirement**—No individual unit develops a crack that exceeds, in length, the unit’s least dimension.

**4.2.4 Waiver of Absorption and Saturation Coefficient Requirements**—If the brick are intended for use exposed to weather where the weathering index is less than 50 (see Fig. 1), and unless otherwise specified, the requirements given in Table 1 for 5 h boiling water absorption and for saturation coefficient shall not apply but the minimum average compressive strength requirement of 2500 psi (17.2 MPa) shall apply.

**NOTE 3**—*Weathering Index*: The effect of weathering on brick is related to the weathering index, which for any locality is the product of the average annual number of *freezing cycle days* and the average annual *winter rainfall* in inches defined as follows:<sup>4</sup>

A *Freezing Cycle Day* is any day during which the air temperature passes either above or below 32°F (0°C). The average number of freezing cycle days in a year may be taken to equal the difference between the mean number of days during which the minimum temperature was 32°F or below and the mean number of days during which the maximum temperature was 32°F or below.

*Winter Rainfall* is the sum, in inches, of the mean monthly corrected precipitation (rainfall) occurring during the period between and including the normal date of the first killing frost in the fall and the normal date of

<sup>4</sup> Data needed to determine the weathering index for any locality may be found or estimated from the tables of Local Climatological Data, published by the Weather Bureau, U. S. Department of Commerce.