



Designation: **C62—13a C62 – 17**

Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale)¹

This standard is issued under the fixed designation C62; 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 U.S. 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. 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 **C216**. This specification does not cover brick intended for use as paving brick (see Specification **C902**).

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 4) 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 Terminology **C1232**).

1.4 Brick are shaped during manufacture by molding, pressing, or extrusion, and the shaping method is a way to describe the brick.

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 standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C67 Test Methods for Sampling and Testing Brick and Structural Clay Tile

C216 Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)

C902 Specification for Pedestrian and Light Traffic Paving Brick

C1232 Terminology for Masonry

3. Terminology

3.1 *Definitions*—For definitions relating to building brick, refer to Terminology **C1232**.

¹ 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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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

4. Classification

4.1 *Grades*—Grades classify brick according to their resistance to damage by freezing when wet, as defined in and thawing when saturated at a moisture **Note 1**. Three grades content not exceeding the 24-h cold water absorption. Three grades of building brick are covered and the grade requirements are shown given in **Table 1**. Section **5**.

4.1.1 *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 and thawing is desired.

4.1.2 *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 and thawing damage is permissible.

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

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.

5. Physical Properties

5.1 *Durability*—When Grade is not specified, the requirements for Grade SW shall govern.

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

5.1.2 *Absorption Alternate*—The saturation coefficient requirement does not apply, provided that the 24-h cold water absorption of each of the five units tested does not exceed 8.0 %.

5.1.3 *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 **C67**.

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 **5.1.2**.

5.1.3.1 *Grade SW: Breakage and Weight Loss Requirement*—No individual unit separates or disintegrates resulting in a weight loss greater than 0.5 % of its original dry weight.

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

5.1.4 *Low Weathering Index Alternative*—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:³

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 the last killing frost in the spring. The winter rainfall for any period is equal to the total precipitation less one tenth of the total fall of snow, sleet, and hail. Rainfall for a portion of a month is prorated.

Fig. 1 indicates general areas in the United States which correspond to the weathering index categories listed. The index for geographic locations near the 50 line should be determined by an analysis of weather bureau local climatological summaries, with due regard to the effect of microclimate conditions, especially altitude.

The use of Grade MW brick in a wall area above grade is structurally adequate in the severe weathering region, but Grade SW would provide a higher and more uniform degree of resistance to frost action. The degree of durability called for by Grade SW is not necessary for use in wall areas above grade

³ Data needed to determine the weathering index for any locality may be found or estimated from the tables of Local Climatological Data—Annual Summary with Comparative Data available from the National Oceanic and Atmospheric Administration.

TABLE 1 Physical Requirements

Designation	Minimum Compressive Strength gross area, psi (MPa)		Maximum Water Absorption by 5-h Boiling, %		Maximum Saturation Coefficient ^A	
	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

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