Designation: C1088 – 20

Standard Specification for Thin Veneer Brick Units Made From Clay or Shale[1]

This standard is issued under the fixed designation C1088; 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.

1. Scope*

1.1 This specification covers thin veneer brick units made from clay, shale, fire clay, sand, or mixtures thereof, and fired to incipient fusion for use in adhered or fastened veneer applications. Three types of thin veneer brick units in each of two grades are covered. In this specification, the term thin veneer brick shall be understood to mean clay masonry unit with a maximum thickness of 1¾ in. (44.45 mm).

1.2 The property requirements of this specification 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 7) of this specification is beyond the scope of this specification.

1.3 The brick are prismatic units available in a variety of sizes, textures, colors, and shapes. This specification is not intended to provide specifications for paving brick (see Specification C902).

1.4 Brick covered by this specification are manufactured from clay, shale, or similar naturally occurring 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 the specification. (See "firing" and "fired bond" in Terminology C1232.)

1.5 Thin brick are shaped during manufacture by molding, pressing, or extrusion. The shaping method is a way to describe the thin brick. Thin brick may also be cut from thicker masonry units.

1.5.1 This standard and its individual requirements shall not be used to qualify or corroborate the performance of a masonry unit made from other materials, or made with other forming methods, or other means of binding the materials.

1.6 The text of this specification 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.

1.7 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.

1.8 *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/C67M Test Methods for Sampling and Testing Brick and Structural Clay Tile

C902 Specification for Pedestrian and Light Traffic Paving Brick

C1232 Terminology for Masonry

3. Terminology

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

4. Classification

4.1 *Grades*—Grades classify brick according to their resistance to damage by freezing and thawing when saturated at a moisture content not exceeding the 24-h cold water absorption. Two grades of thin veneer brick units are covered and the requirements are given in Section 7.

4.1.1 *Grade Exterior*—Brick intended for use where high resistance to damage caused by cyclic freezing and thawing is desired.

4.1.2 *Grade Interior*—Brick intended for use where moderate resistance to cyclic freezing and thawing damage is permissible.

[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**

4.2 Three types of thin veneer brick units are covered as follows:

4.2.1 *Type TBS (Standard)*—Thin veneer brick for general use in masonry.

4.2.2 *Type TBX (Select)*—Thin veneer brick for general use in masonry where a higher degree of precision and lower permissible variation in size than permitted for Type TBS is required.

4.2.3 *Type TBA (Architectural)*—Thin veneer brick for general use in masonry selected to produce characteristic architectural effects resulting from nonuniformity in size and texture of the individual units.

4.3 When the type is not specified, the requirements for Type TBS will govern.

5. Ordering Information

5.1 Orders for thin brick under this specification shall include the following information:

5.1.1 *Grade (4.1)*—Grade Exterior governs when grade is not specified.

5.1.2 *Type (4.2)*—Type TBS governs when type is not specified.

5.1.2.1 For Type TBA, specify chippage (10.1), tolerances (Section 9), or approve a designated sample.

5.1.3 Color, color range, and texture (10.4) by approving a sample.

5.1.3.1 Finish on more than one face (9.5).

5.1.4 *Size (9.1)*—Specify width (thickness) by height by length.

5.1.5 *Sampling (12.2)*—Person to select samples and place or places of selection of samples for testing.

5.2 Orders for facing brick under this specification may include the following information:

5.2.1 Back Surface Texture Face Requirements (Section 11).

5.2.2 Costs of Tests (Note 9)—Party who will pay and conditions for payment of compliance testing.

NOTE 1—Color, color range, and texture are best specified by identifying a particular manufacturer and unit designation. Nominal dimensions should not be used to specify size.

NOTE 2—See Section 7 for optional information.

5.3 If any post-firing coatings or surface treatments are applied by the manufacturer, the manufacturer shall report the type and extent of these coatings or surface treatments in all certificates of compliance with this specification. Coatings or surface treatments applied to the finished surface of the brick by the manufacturer prior to installation for temporary protection of the brick surface shall not be considered a post fired coating for the purpose of this specification. Evidence proving the removal of the temporary coating or surface treatment has no effect on performance or appearance of the brick shall be furnished at the request of the specifier or purchaser.

6. Materials and Manufacture

6.1 Units shall not show surface defects and deficiencies, nor effects of surface treatments including coating in the manufacturing process, that interfere with installation of the brick or significantly impair the performance of the construction.

6.2 Colors and textures produced by application of inorganic coatings to the faces of the thin veneer brick are permitted if approved by the purchaser, provided that evidence is furnished of the durability of the coatings. Thin brick that are colored by flashing or textured by sanding, where the sand does not form a continuous coating, shall not be considered as surface colored brick for the purpose of this specification.

6.2.1 Sampling and testing of such inorganic coating, including double-fired glazes, shall be in accordance with applicable sections of Test Methods C67/C67M.

7. Physical Properties

7.1 *Durability*—When the grade is not specified, the requirements for Grade Exterior shall govern.

7.1.1 *Physical Property Requirements*—The brick shall conform to the physical property requirements as prescribed in Table 1.

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

7.1.3 *Freezing and Thawing Alternative*—The requirements specified in Table 1 do not apply, provided a sample of five brick passes the freezing and thawing test as described in the Rating Section of the Freezing and Thawing test procedures of Test Methods C67/C67M.

7.1.3.1 *Grade Exterior: 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.

7.1.3.2 *Grade Exterior: Cracking Requirement*—No individual unit develops a crack that exceeds, in length, the unit's least face dimension.

7.1.4 *Low Weathering Index Alternative*—If the thin 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 Grade Interior shall apply.

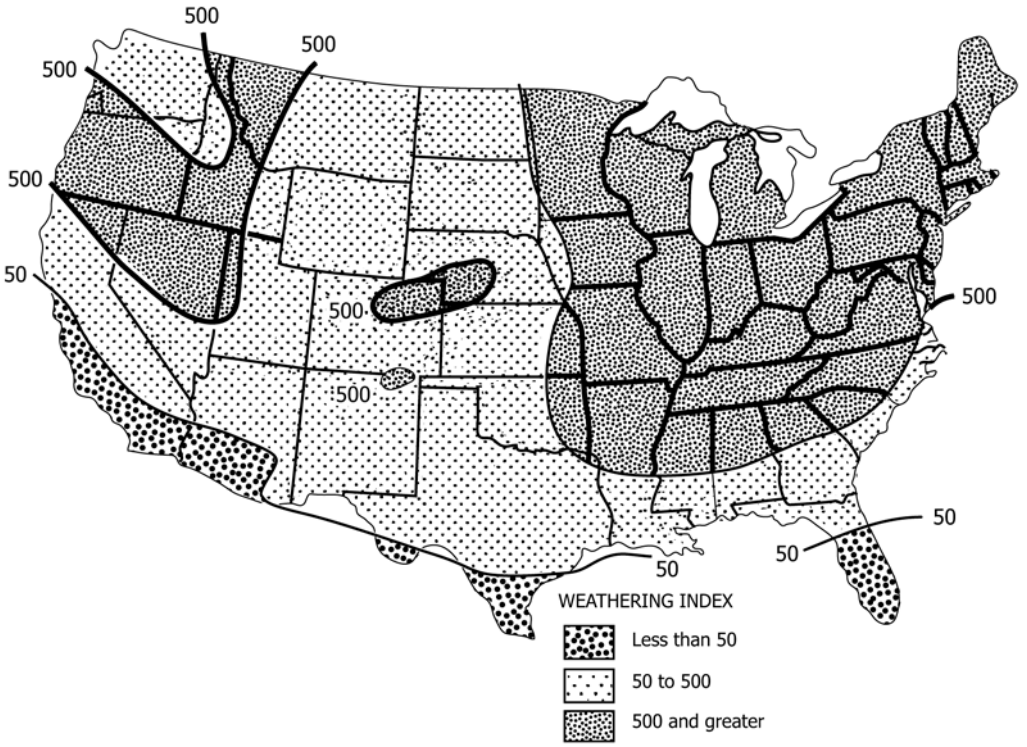
NOTE 3—A minimum compressive strength requirement is not included in combination with other physical property requirements as an indicator of freeze/thaw durability. The geometry of the thin brick units may preclude proper testing and can affect the failure mode attained. Thus, compressive strength test results may not be a true indicator of unit freeze-thaw performance or fired bond.

NOTE 4—The effect of weathering on thin brick is related to the weathering index, which for any locality is the product of the average

TABLE 1 Physical Requirements

Designation	Maximum Water Absorption by 5-h Boiling, %		Maximum Saturation Coefficient[A]	
	Average of 5 units	Individual	Average of 5 units	Individual
Grade Exterior	17.0	20.0	0.78	0.80
Grade Interior	22.0	25.0	0.88	0.90

[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.



Grade Recommendations for Face Exposures		
Exposure	Weathering Index (Note 4)	
	Less than 50	50 and greater
In vertical surfaces:		
In contact with earth	MW	SW
Not in contact with earth	MW	SW
In other than vertical surfaces:		
In contact with earth	SW	SW
Not in contact with earth	MW	SW

FIG. 1 Weathering Indices in the United States

annual number of freezing cycle days and the average annual winter rainfall in inches (millimetres), defined as follows.

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 (0°C) or below, and the mean number of days during which the maximum temperature was 32°F (0°C) or below.

Winter rainfall is the sum in inches (millimetres) 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.

8. Efflorescence

8.1 Brick are not required to be tested for efflorescence to comply with this specification unless requested by the specifier or purchaser. When the efflorescence test is requested by the specifier or purchaser, the brick shall be sampled at the place of manufacture, and tested in accordance with Test Methods C67/C67M, and a rating for efflorescence shall be "not effloresced." If the rating for efflorescence is "effloresced," the brick represented by the testing do not meet the efflorescence requirements of this specification.

9. Dimensions and Permissible Variations

9.1 *Size*—The size of thin veneer brick shall be as specified by the purchaser. In a representative sample of ten units selected to include the extreme range of color and dimensions of thin veneer brick to be supplied for each size and color combination in the purchase order, no thin brick shall depart from the specified size by more than the individual tolerance for the type specified as prescribed in Table 2. Tolerances on dimensions for Type TBA shall be as specified by the purchaser.

TABLE 2 Tolerances on Dimensions[A]

Specified Dimension, in. (mm)	Maximum Permissible Variation from Specified Dimension, ±in. (mm)	
	Type TBX	Type TBS
3 (76) and under	1/16 (1.6)	3/32 (2.4)
Over 3 to 4 (76 to 102) incl	3/32 (2.4)	1/8 (3.2)
Over 4 to 6 (102 to 152) incl	1/8 (3.2)	3/16 (4.7)
Over 6 to 8 (152 to 203) incl	5/32 (4.0)	1/4 (6.4)
Over 8 to 12 (203 to 305) incl	7/32 (5.6)	5/16 (7.9)
Over 12 to 16 (305 to 406) incl	9/32 (7.1)	3/8 (9.5)

[A] Tolerances for Type TBA shall be listed in purchase specification.

NOTE 5—Specified thickness includes scores, ribs, or other back surface textures.

NOTE 6—Brick names denoting sizes may be regional and therefore may not be included in all reference books. Purchasers should ascertain the size of brick available in their locality and should specify accordingly, stating the desired dimensions (width by height by length).

9.2 *Warpage*—Tolerances for warpage of face or edges of individual units from a plane surface shall not exceed the maximum for the type specified as prescribed in Table 3. Tolerances on warpage for Type TBA shall be as specified by the purchaser.

10. Finish and Appearance

10.1 *Face or Faces:*

10.1.1 The face or faces that will be exposed in place shall be free of chips that exceed the limits given in Table 4. The aggregate length of chips shall not exceed 10 % of the perimeter of the face or faces of the thin veneer brick.

10.1.2 The face or faces shall not contain cracks or other imperfections that detract from the appearance of the designated sample when viewed under diffused lighting from a distance of 15 ft (4.6 m) for Type TBX and a distance of 20 ft (6.1 m) for Types TBS and TBA.

10.2 The number of thin veneer brick in a delivery that are broken or otherwise fail to meet the requirements for chippage and tolerances shall not exceed 5 %.

10.3 After thin veneer brick are installed, the manufacturer or the manufacturer's agent shall not be held responsible for compliance of thin veneer brick with the requirements of this specification for chippage and tolerances.

TABLE 3 Tolerances on Warpage[A]

Maximum Face Dimension, in. (mm)	Maximum Permissible Warpage, in. (mm)	
	Type TBX	Type TBS
8 (203) and under	1/16 (1.6)	3/32 (2.4)
Over 8 to 12 (203 to 305) incl	3/32 (2.4)	1/8 (3.2)
Over 12 to 16 (305 to 406) incl	1/8 (3.2)	5/32 (4.0)

[A] Tolerances for Type TBA shall be listed in purchase specification.

10.4 If brick having a particular color, color range, or texture are desired, these features shall be specified separately by the purchaser. The texture of the finished surfaces that will be exposed when in place shall conform to an approved sample consisting of not less than four typical stretcher thin veneer brick, each representing the desired texture. The color range shall be indicated by the approved sample.

10.5 Where brick with other than one finished stretcher face are required (brick with two finished faces such as a stretcher face and head or bed), all such special brick shall be explicitly specified by the purchaser.

NOTE 7—The manufacturer should be consulted for the availability of units suitable for the intended purpose.

11. Back Surface Texture

11.1 *Back Surface Texture*—Thin brick back surface textures are at the option of the manufacturer. Special surface configurations or requirements shall be specified and shall meet all other requirements of this section.

NOTE 8—The manufacturer should be consulted for the availability of specific surface textures.

12. Sampling and Testing

12.1 The brick shall be sampled and tested in accordance with applicable sections in Test Methods C67/C67M.

12.2 The manufacturer or the seller shall furnish specimens for tests. The place or places of selection shall be designated when the purchase order is placed.

NOTE 9—Unless otherwise specified in the purchase order, the cost of tests is typically borne as follows: if the results of the test show that brick do not conform to the requirements of this specification, the cost is typically borne by the seller. If the results of the tests show that the brick do conform to the requirements of this specification, the cost is typically borne by the purchaser.

13. Keywords

13.1 appearance requirements; clay; fired masonry units; masonry; physical properties; shale; thin brick

TABLE 4 Maximum Permissible Extent of Chippage from the Edges and Corners of Finished Face or Faces onto the Surface

Type	Percentage Allowed[A]	Chippage in. (mm) in from		Percentage Allowed[A]	Chippage in. (mm) in from	
		Edge	Corner		Edge	Corner
TBX	5 % or less	⅛ to ¼ (3.2 to 6.4)	¼ to ⅜ (6.4 to 9.5)	95 to 100 %	0 to ⅛ (0 to 3.2)	0 to ¼ (0 to 6.4)
TBS (formed)[B]	10 % or less	¼ to 5/16 (6.4 to 7.9)	⅜ to ½ (9.5 to 12.7)	90 to 100 %	0 to ¼ (0 to 6.4)	0 to ⅜ (0 to 9.5)
TBS (altered)[C]	15 % or less	5/16 to 7/16 (7.9 to 11.1)	½ to ¾ (12.7 to 19.1)	85 to 100 %	0 to 5/16 (0 to 7.9)	0 to ½ (0 to 12.7)
TBA	as specified by the purchaser			as specified by the purchaser		

[A]Percentage of exposed brick allowed in the wall with chips measured the listed dimensions in from an edge or corner.
[B]Formed units are extruded brick with an unbroken natural die finish face.
[C]Altered units are extruded brick with the face sanded, combed, scratched, scarified, or broken by mechanical means such as wire-cutting or wire brushing, or are molded brick.

SUMMARY OF CHANGES

Committee C15 has identified the location of selected changes to this standard since the last issue (C1088 – 19a) that may impact the use of this standard. (February 1, 2020)

(1) Added 5.3 to address post fire coatings.

Committee C15 has identified the location of selected changes to this standard since the last issue (C1088 – 19) that may impact the use of this standard. (December 1, 2019)

(1) Modified 6.2.1 to add reference to glaze testing.

Committee C15 has identified the location of selected changes to this standard since the last issue (C1088 – 18) that may impact the use of this standard. (March 1, 2019)

(1) Removed old Note 1 and added new 1.3 to clarify that this specification is not intended to provide specifications for paving. Renumbered following subsections as required.
(2) Revised 6.2 to clarify that colors obtained by flashing or textured with sand are not considered surface colored thin brick.
(3) Revised 9.1 to allow tolerances to include width (or depth). Added Note 5 to clarify inclusions in thickness measurement.
(4) Added 10.5 and Note 7 to clarify that shapes are considered any unit with more than one finished face with note clarifying that manufacturer should be consulted for availability. Renumbered following sections as required.