Designation: C 1088 – 04

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

This standard is issued under the fixed designation C 1088; 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).

NOTE 1—Brick intended for paving should be specified under 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 5) of this standard is beyond the scope of this standard.

1.3 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 C 43.)

1.4 The values stated in inch-pound units are to be regarded as standard. The metric equivalents may be approximate.

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.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

C 43 Terminology of Structural Clay Products

C 67 Test Methods for Sampling and Testing Brick and Structural Clay Tile

C 902 Specification for Pedestrian and Light Traffic Paving Brick

E 835/E 835M Guide for Modular Coordination of Clay and Concrete Masonry Units

3. Grades

3.1 Two grades of thin veneer brick units are covered for exposure conditions to weather and are defined in Table 1 as Interior and Exterior.

4. Types

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

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

4.1.2 *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.

4.1.3 *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.

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

5. Physical Properties

5.1 *Durability*—The thin veneer brick shall conform to the physical requirements in Table 1 for the grade specified. When the grade is not specified, the requirements for Grade Exterior shall govern. If the water absorption of each unit is less than 8.0 % after submersion in cold water for 24 h, the requirements for saturation coefficient shall be waived. If exterior or interior grade thin veneer brick are intended for use on interiors only, the requirements for water absorption (5-h boiling) and for saturation coefficient for interior grade in Table 1 shall govern.

5.2 *Freezing and Thawing*—The requirements specified in 5.1 for water absorption (5-h boiling) and saturation coefficient shall be waived provided a sample of 5 typical exterior grade thin veneer brick, meeting all other requirements, complies with the following requirements when subjected to 50 cycles of the freezing-and-thawing test:

[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 Clay 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.**

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.

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

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

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

5.3 *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.

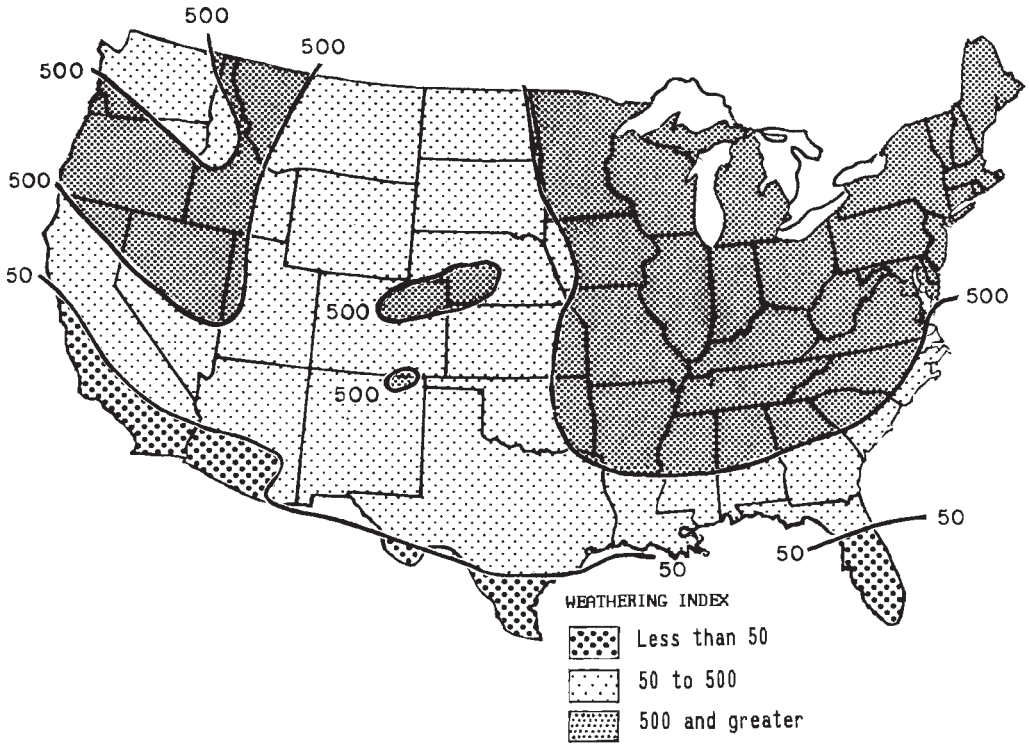
NOTE 2—The effect of weathering on thin brick is related to the weathering index, which for any locality is the product of the average annual number of freezing cycle days and the average annual winter rainfall in inches (millimetres), defined as follows.

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.

6. Efflorescence

6.1 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 C 67, and a rating for efflorescence shall be "not effloresced." If the



Grade Recommendations for Face Exposures

Exposure	Weathering Index (Note 2)	
	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

rating for efflorescence is "effloresced," the brick represented by the testing do not meet the efflorescence requirements of this specification.

7. Material, Finish, and Manufacturer Limitation

7.1 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.

7.2 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.

7.3 *Face or Faces*:

7.3.1 The face or faces that will be exposed in place shall be free of chips that exceed the limits given in Table 2. The aggregate length of chips shall not exceed 10 % of the perimeter of the face or faces of the thin veneer brick.

7.3.2 The face or faces shall not contain cracks or other imperfections that detract from the appearance of the designated sample when viewed 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.

7.4 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 %.

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

8. Color and Texture

8.1 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.

9. Size

9.1 *Size*—The face 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 3. Tolerances on dimensions for Type TBA shall be as specified by the purchaser.

NOTE 3—For a list of modular sizes see Guide E 835/E 835M. Sizes listed in this standard are not produced in all parts of the United States. 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 distortion or 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 4. Tolerances on distortion for Type TBA shall be as specified by the purchaser.

10. Sampling and Testing

10.1 For purposes of tests, units that are representative of the commercial product shall be selected by a competent person appointed by the purchaser, the place or places of selection to be designated when the purchase order is placed. The sample or samples shall include specimens representative of ten thin veneer brick samples for each size and color combination in purchase order of the thin veneer brick supplied or to be supplied. The manufacturer or the seller shall furnish specimens for tests without charge.

10.2 The thin veneer brick shall be sampled and tested in accordance with Test Methods C 67. The provision of the brick Sampling Section in Test Methods C 67 shall govern the number of samples tested.

TABLE 2 Maximum Permissible Extent of Chippage from the Edges and Corners of Finished Face or Faces onto the Surface

Type	Percentage Allowed[A]	Chippage in in. (mm) in from		Percentage Allowed[A]	Chippage in 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.

TABLE 3 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.

TABLE 4 Tolerances on Distortion[A]

Maximum Face Dimension, in. (mm)	Maximum Permissible Distortion, 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.

SUMMARY OF CHANGES

Committee C15 has identified the location of the following changes since C 1088–03 that may impact the use of this standard.

(1) Open-ended agreements were removed from paragraph 7.4.

Committee C15 has identified the location of the following changes since C 1088–02 that may impact the use of this standard.

(1) The title of section 5.3 was revised to provide consistent language within the requirements for durability.

Committee C15 has identified the location of selected changes to this standard since C 1088–01a that may impact the use of this standard.

(1) Paragraph 5.3, Figure 1, and Note 2 were added to allow provisions of units used in exterior exposures in negligible weathering regions of the United States