



# Standard Test Method for Facial Dimensions and Thickness of Flat, Rectangular Ceramic Wall and Floor Tile<sup>1</sup>

This standard is issued under the fixed designation C 499; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers the determination of the facial dimensions and thickness of flat, rectangular ceramic wall and floor tile. This test method covers tile as defined in Terminology C 242.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

### 2.1 ASTM Standards:

C 242 Terminology of Ceramic Whitewares and Related Products<sup>2</sup>

## 3. Terminology

### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *major facial dimension*—the overall length or width of the tile, including the lugs on opposite sides.

3.1.2 *major thickness*—the thickness of tile, including any maximum protuberances or ridges on the back.

3.1.3 *minor facial dimension*—the length or width of the tile exclusive of the lugs.

3.1.4 *minor thickness*—the thickness of tile that does not include maximum protuberances or ridges.

## 4. Significance and Use

4.1 This test method provides a means of determining whether a lot of tile meets specifications of variations in size and thickness. In specifications, the nominal size always refers to the minor facial dimension and the nominal thickness of a tile always refers to the major thickness.

## 5. Apparatus

5.1 A suitable measuring device such as a micrometer or dial indicator, reading in 0.001-in. (0.025-mm) divisions and accurate to  $\pm 0.001$  in. ( $\pm 0.025$  mm), shall be used. If a dial indicator is used, suitable jigs for holding the tile and the indicator shall be provided.

## 6. Test Specimens

6.1 Select tile specimens at random from the lot to be tested. For tile smaller than 6 in.<sup>2</sup> (38.7 cm<sup>2</sup>) in facial area, use at least ten specimens for each test; for tile 6 in.<sup>2</sup> or larger in facial area, use at least five specimens for each test. The same specimens may be used for the determination of facial dimensions and thickness. Brush the specimens to remove all adhering particles of clay or sand.

## 7. Procedure

7.1 *Major Facial Dimension*—Measure the length of the tile to the nearest 0.001 in. (0.025 mm) across two pairs of opposite lugs. Follow the same procedure for measuring the width of the tile. For tile whose lugs are not arranged opposite each other, it may be necessary to use a jig to obtain the major facial dimensions. For square tile, average all four measurements and call the result the average major dimension. For oblong tile, average the two length measurements and call the result the average major length of the tile; average the two width measurements and call the result the average major width of the tile.

7.2 *Minor Facial Dimension*—Measure the length of the tile exclusive of the lugs to the nearest 0.001 in. (0.025 mm) in two places. Follow the same procedure for measuring the width exclusive of the lugs. Points of measurement shall be at least 0.25 in. (6.4 mm) and not more than 0.50 in. (12.7 mm) from the corners of the tile. For tile with tapered sides, a jig is required to determine the minor facial dimension of such tile. For square tile, average all four measurements and call the result the average minor dimension. For oblong tile, average the two length measurements and call the result the average minor length; average the two width measurements and call the result the average minor width.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Products and is the direct responsibility of Subcommittee C21.06 on Ceramic Tile.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 15.02.

7.3 *Major Thickness*—Measure the major thickness to the nearest 0.001 in. (0.025 mm) at each of the four corners of the tile including any protuberances or ridges on the back of the tile. Points of measurement shall be at least 0.25 in. (6.4 mm) and not more than 0.75 in. (19.0 mm) in from the edge of the tile. Average the four readings and call the result the average major thickness.

7.4 *Minor Thickness*—Measure the minor thickness to the nearest 0.001 in. (0.025 mm) near each of the four corners of the tile not including any protuberances or ridges on the back of the tile. Points of measurements shall be at least 0.25 in. (6.4 mm) and not more than 0.75 in. (19.0 mm) in from the edge of the tile. Average the four readings and call the result the average minor thickness.

## 8. Report

8.1 The report shall give the type and number of tile tested and shall show for each specimen the following information:

8.1.1 Average, maximum, and minimum values of the major length,

8.1.2 Average, maximum, and minimum values of the major width,

8.1.3 Average, maximum, and minimum values of the minor length,

8.1.4 Average, maximum, and minimum values of the minor width,

8.1.5 Average, maximum, and minimum values of the major thickness, and

8.1.6 Average, maximum, and minimum values of the minor thickness.

NOTE 1—For square tile, 8.1.2 and 8.1.3 shall be omitted. For tile without lugs, major and minor facial dimensions are identical. The major and minor thickness of tile without any protuberances or ridges on the back is identical.

## 9. Precision and Bias

9.1 *Precision*—The precision of the average dimensions reported is  $\pm 0.002$  in. (0.05 mm).

9.2 *Bias*—Bias depends almost entirely on the accuracy of the measuring devices and care taken to set up the equipment. No interlaboratory data are available with which to estimate bias.

## 10. Keywords

10.1 ceramic tile; facial dimension; major dimension; minor dimension; thickness dimension

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