



Designation: **C502—09 C502 – 16**

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

This standard is issued under the fixed designation C502; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

## 1. Scope

1.1 This test method covers the determination of the wedging or deviation from rectangularity of flat, rectangular wall and floor tile. The test method covers tile as defined in Terminology [C242](#).

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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:*<sup>2</sup>

[C242 Terminology of Ceramic Whitewares and Related Products](#)

[C499 Test Method for Facial Dimensions and Thickness of Flat, Rectangular Ceramic Wall and Floor Tile](#)

## 3. Terminology

3.1 *Definitions:*

3.1.1 *wedging of tile*—the difference between two spaced measurements of the length or width of a tile, expressed as a percentage of the distance between points of measurements.

3.2 For the definition of major and minor facial dimensions see Test Method [C499](#).

## 4. Significance and Use

4.1 Tile are normally pressed in dies having true 90° angle construction. However, minor variations in die fill, compacting pressure, and heat treatment can result in finished tile with acute and obtuse angles. This out-of-squareness results in a difference in length of opposite sides, and the tile may have the appearance of a keystone or wedge.

4.2 Excessive wedging presents difficulties in the installation of tile. This test method provides a means for determining the degree of wedging.

## 5. Apparatus

5.1 An apparatus as shown in [Fig. 1](#) or other suitable apparatus. The dial gage (B) is used for measuring rectangularity.

5.2 A calibrating plate made of steel or aluminum of accurate dimensions and with straight, flat sides.

## 6. Test Specimens

6.1 At least ten tile specimens shall be selected at random from the lot to be tested. The specimens shall be brushed to remove all adhering particles of clay and sand.

## 7. Procedure

7.1 Select an apparatus of the appropriate dimensions so that, when a tile is placed in the apparatus, the locating studs are 5 mm from each corner of the side adjacent to the side being measured. The plunger of the gage (B) shall also be 5 mm from the corner of the tile on the side being measured.

<sup>1</sup> This 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> 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.

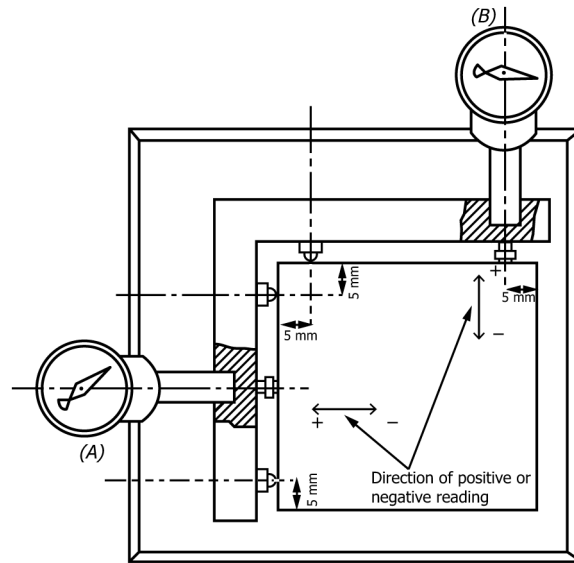


FIG. 1 Apparatus for Measurement of Straightness of Sides and Rectangularity

7.2 Fit the appropriate calibrating plate exactly into position on the instrument and adjust the gauge reading to a suitable known value.

7.3 Remove the calibrating plate, place the proper surface of the tile on the locating studs in the apparatus, and record the gage reading 5 mm from the corner. Rotate the tile, if square, to obtain four measurements. Repeat this procedure for each tile. In the case of oblong tiles, use separate instruments of the appropriate dimensions to measure lengths and widths. Measure to an accuracy of 0.1 mm.

7.4 For oblong tiles with longer edge  $\geq 60$  cm, and ratio between longer edge and shorter edge  $\geq 3$ , only  $d_L$  and percent wedging shall be  $\frac{d_L}{S}$  determined (see Fig. 3).

## 8. Calculation

8.1 Calculate the percentage of wedging or deviation from rectangularity as follows: Wedging is expressed as:

$$\frac{d}{L} \times 100 = \% \quad (1)$$

where:

$L$  = length of the adjacent side of the tile and

$d$  = deviation of the outer corner of the side of the tile (measured 5 mm from the corner) from the inner side of the calibrating plate.

8.1.1 In millimeters,  $d$ , for square tiles (see Fig. 2) and deviation  $d_L$  and  $d_S$  for oblong tiles (see Fig. 3).

8.1.2 A percentage, using the formula:

$$\frac{d}{L} \text{ for square tiles, and } \frac{d_L}{S} \text{ and } \frac{d_S}{L} \text{ for oblong tiles}$$

where:

$L$  = length of the sides of the tile in accordance with Figs. 2 and 3,

$S$  =

$d$  = deviation of the outer corner of the side of the tile (measured 5 mm from the corner) from the inner side of the calibrating plate.

## 9. Report

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

9.1.1 Average, maximum, and minimum percentage of wedging of the major lengths;

9.1.2 Average, maximum, and minimum percentage of wedging of the major widths;

9.1.3 Average, maximum, and minimum percentage of wedging of the minor lengths, and

9.1.1 Average, maximum, and minimum percentage of wedging of wedging, in millimeters and as a percentage of the major and minor lengths and widths, except for oblong tiles when the longer edge  $\geq 60$  cm and the ratio between the longer edge and the