Designation: C502 – 16

Standard Test Method for Wedging of Flat, Rectangular Ceramic Wall and Floor Tile[1]

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 reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

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:*[2]

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.

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

8. Calculation

8.1 Wedging is expressed as:

[1] This method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Productsand is the direct responsibility of Subcommittee C21.06 on Ceramic Tile.

Current edition approved Nov. 1, 2016. Published November 2016. Originally approved 1962. Last previous edition approved in 2009 as C502 – 09. DOI: 10.1520/C0502-16.

[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.

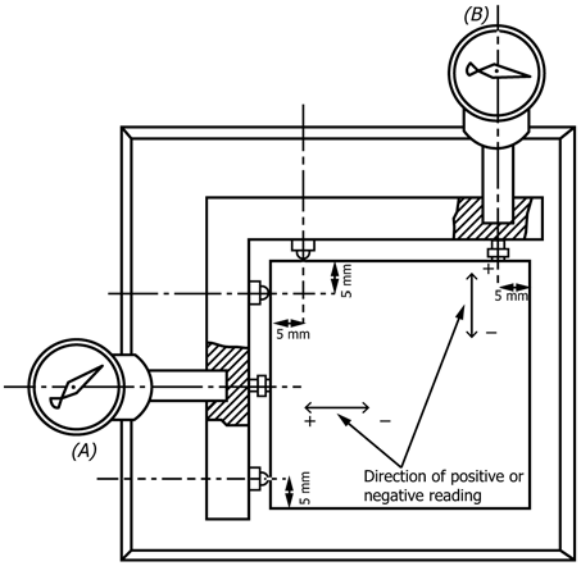


FIG. 1 Apparatus for Measurement of Straightness of Sides and Rectangularity

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 wedging, in millimeters and as a percentage of the major and minor lengths and widths, except for oblong tiles when the longer edge ≥ 60 cm and the ratio between the longer edge and the shorter edge ≥ 3, where only dL and percent wedging $\frac{d_L}{S}$ shall be reported.

NOTE 1—For nominally square tile, length and width are assumed as equal and are calculated from the maximum difference among the four measurements.

10. Precision and Bias

10.1 Precision is being determined.

10.2 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 a bias.

11. Keywords

11.1 flat, rectangular ceramic wall and floor tile; wedging

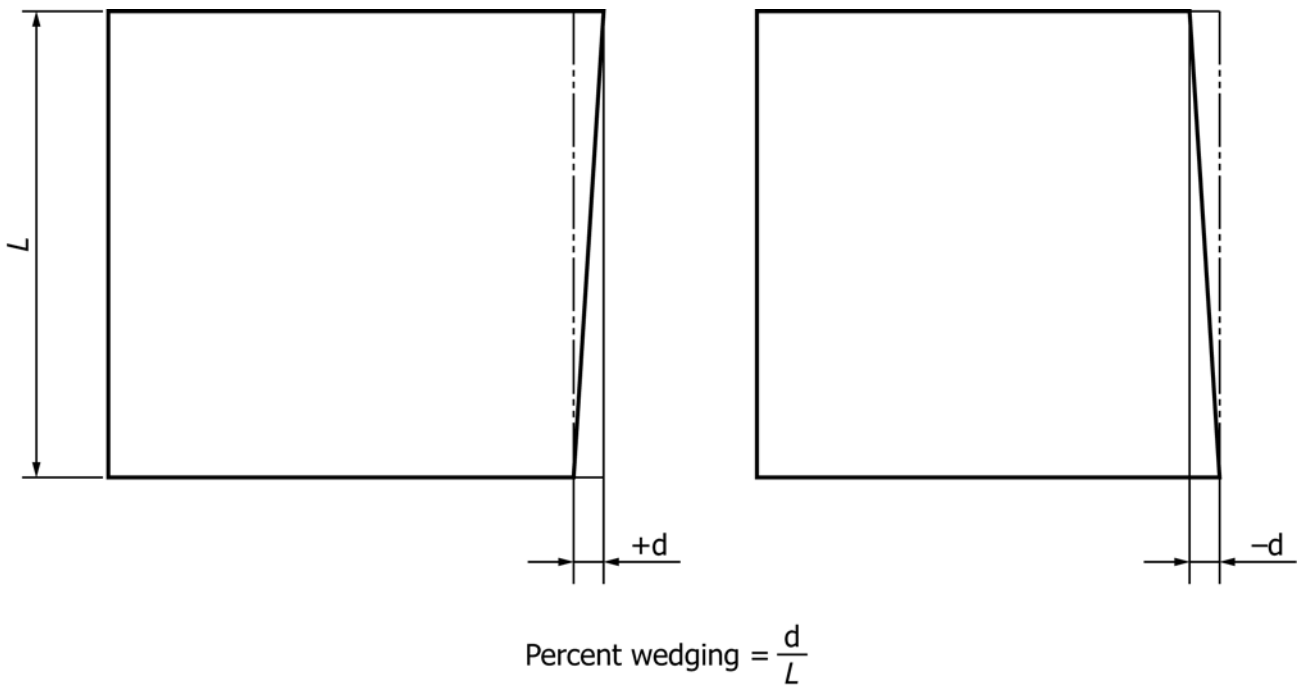
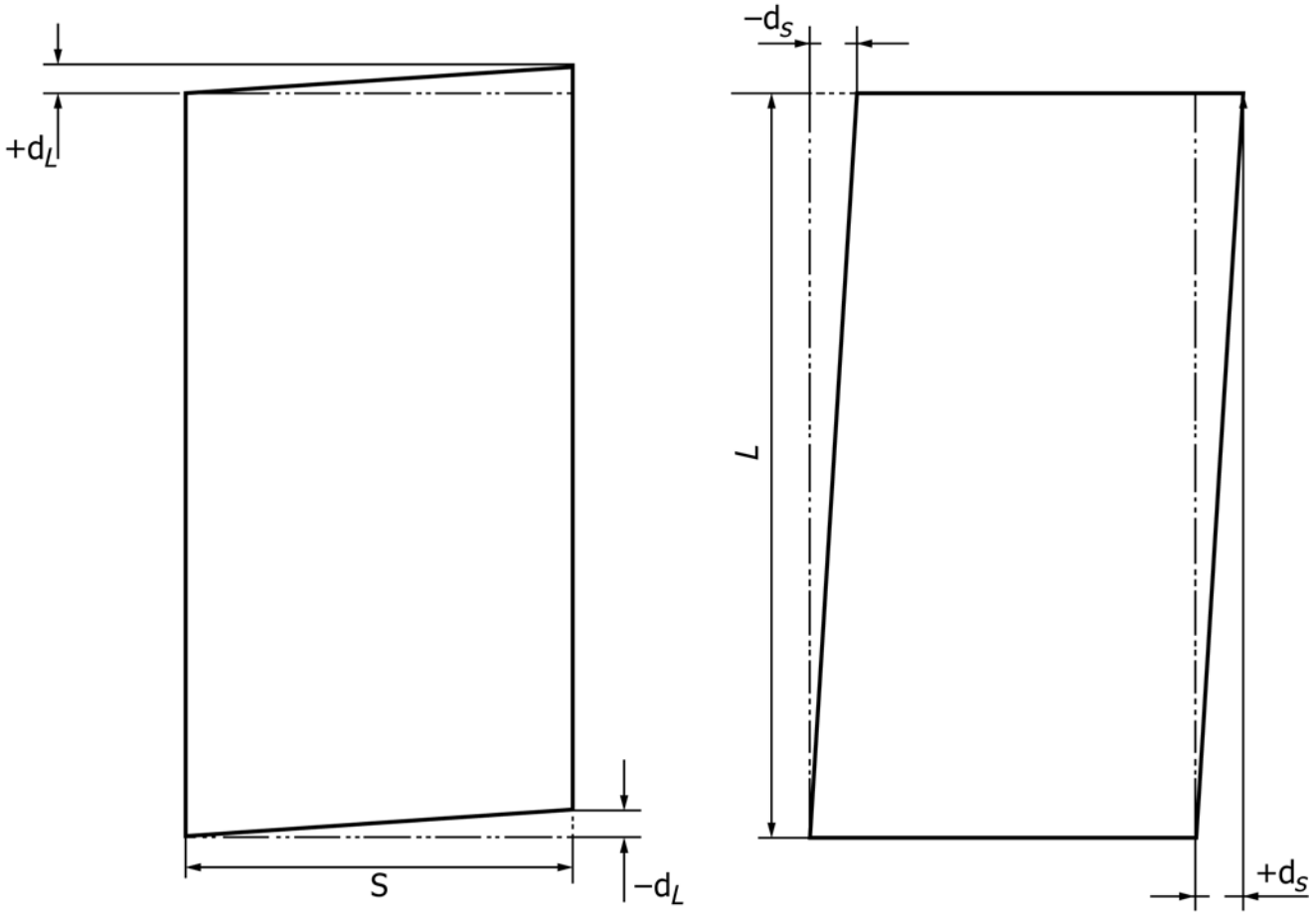


FIG. 2 Wedging (Square Tiles)



Percent wedging : $\frac{d_L}{S}$ and $\frac{d_S}{L}$

Note: For oblong tiles with longer edge ≥ 60 cm, and ratio between longer edge and shorter edge ≥ 3, only d_L and percent wedging $\frac{d_L}{S}$ are applicable

FIG. 3 Wedging (Oblong Tiles)