Designation: F 2055 – 00

Standard Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method[1]

This standard is issued under the fixed designation F 2055; 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 both dimensions (length and width) and squareness of resilient floor tile. This test method is intended for use with square tiles ranging from a nominal 9 in. (226 mm) to 40 in. (1016 mm) in dimension.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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:*

F 141 Terminology Relating to Resilient Floor Coverings[2]

F 536 Test Method for Size of Resilient Floor Tile by Dial Gage Method[2]

F 540 Test Method for Squareness of Resilient Floor Tile by Dial Gage Method[2]

3. Significance and Use

3.1 Both dimension and squareness of resilient floor tile are important considerations, because installed flooring may exhibit an objectionable appearance when either or both characteristics deviate from established tolerances. This test method provides a means of determining actual dimensions and squareness by using a single apparatus and procedure. This test method may be used as a substitute for Test Methods F 536 and F 540, which allow for similar measurements on resilient floor tile up to 12 in. (305 mm) in size.

4. Apparatus

4.1 The apparatus shall consist of four dial gages (referenced A through D in Fig. 1) and two reference index strips mounted on a flat bedplate in a configuration that, by rotation of the sample, allows the measurement of all four sides of resilient tile samples (see Fig. 1). One edge of the bedplate is elevated to create a test surface which is offset or tilted 15 ± 1 degrees from horizontal. This offset applies minimal pressure to the test specimen against the longer index strip to ensure repeatable measurement. A reference plate representing target tile size and squareness is used to zero all dial gages (see Fig. 2).

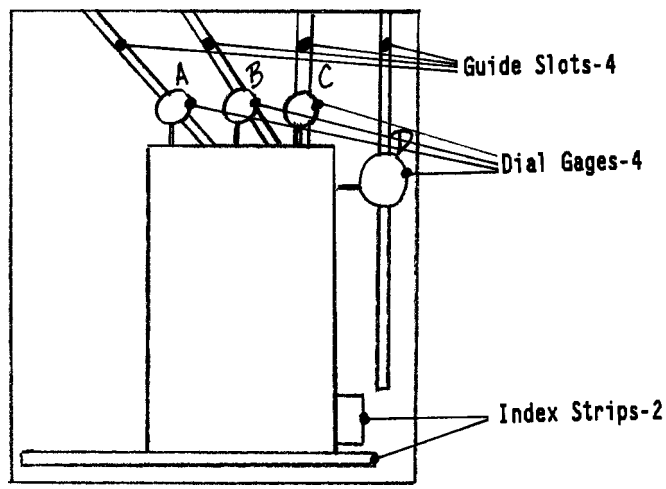


FIG. 1 Tile Measurement Apparatus

4.2 *Dial Gages*—The four dial gages are mounted in guide slots that are machined into the bedplate to allow for measurement of various tile sizes while remaining within 10% of the corner of the tile edge (for the two corner gages and one squareness gage) or within the central 10% of the tile edge (for the center gage only). Dial gages may report measurements using either electrical or mechanical means, but they shall be graduated to read 0.001 in. (0.02 mm) and have a stem travel greater than 0.25 in. (6 mm). The contact foot of the dial-gage stem shall be flat 0.50–0.75 ± 0.001 in. (12.7–19.1 mm ± 0.2 mm) in diameter and exert a total force of not more than 3.0 ± 0.1 ozf (0.83 ± 0.003 N). Dial gages shall be securely positioned so that when the reference plate is in place, the contact foot is extended approximately 50% of its full travel.

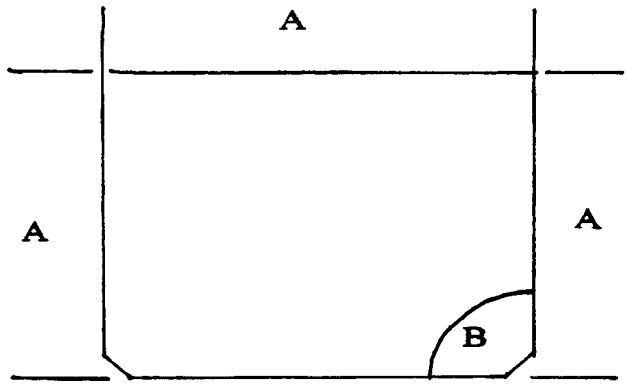
4.3 *Index Strips*—The apparatus contains 2 fixed index strips. A horizontal index strip shall be mounted parallel to and just inside the lower edge of the bedplate. It shall be 1.5 ± 0.1 in. (38 ± 3 mm) greater in length and a minimum of twice the thickness of the largest tile to be tested. A second index strip shall be mounted 90° ± 10 s (1.57080 ± 0.00005 rad.) to the

[1] This test method is under the jurisdiction of ASTM Committee F06 on Resilient Floor Coverings and is the direct responsibility of Subcommitte F06.20 on Test Methods—Products Construction/Materials.

Current edition approved Sept. 10, 2000. Published November 2000.

[2] *Annual Book of ASTM Standards,* Vol 15.04.

Copyright © ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, United States.



A: Tile Target Dimension ± 0.001 in. (0.02 mm)
B: 90° ± 10 s (1.57080 ± 0.00005 rad.)

FIG. 2 Reference Plate

horizontal index strip. The lower end of this index strip shall be 0.125 ± 0.01 in. (3.1 ± 0.25 mm) above the right end of the horizontal index strip and is used to locate one corner of the sample tile.

4.4 *Reference Plate*—The reference plate shall be made to the target dimensions of the manufactured tile. The length and width dimensions shall be within ± 0.001 in. (0.02 mm) of the specified dimensions of the resilient tile. The reference plate shall contain at least two sides which are perpendicular to 90° ± 10 s (1.57080 ± 0.00005 rad.) to one another and are used to set the squareness gage to zero.

5. Specimens

5.1 The specimens shall consist of 5 full size tiles.

6. Conditioning

6.1 Condition the test specimens, reference plate, and apparatus a minimum of 24 h at 73.4 ± 1.8°F (23 ± 1°C) and 50 ± 5% relative humidity. Tests shall be conducted in this same environment. Samples shall be conditioned on a flat surface such as a table or floor surface to ensure they will contact the bedplate uniformly during measurement.

7. Procedure

7.1 Place the appropriate reference plate onto the bedplate surface and slide it firmly against the two index strips. Set each of the four dial indicators to zero. Remove the reference plate. All dial indicators will now reflect their fully extended measurements. In the case of digital dial indicators, the display will indicate a negative number. In the case of mechanical dial indicators, the display will move counter-clockwise from zero.

NOTE 1—Dirt and foreign particles may collect along the upper face of the index strip and affect the zero setpoint. Use a small brush to maintain the cleanliness of the index strip surfaces before and after each use.

7.2 *Measuring Size and Squareness*—Identify one edge of the sample tile as "Edge #1" by attaching a label to the face of the tile near that edge. Place the tile into the apparatus and carefully move it into position such that it will depress all four dial gages and is in firm contact with both index strips. Record the measurements on all four gages to the nearest 0.001 in. (0.02 mm).

7.3 Remove the tile from the bedplate and rotate it 90° in the clockwise direction. Repeat the process described in 7.2 and record the four gage readings. Repeat for each of the two remaining sides.

7.4 After all samples have been measured, place the reference gage back on the bedplate to verify that no movement of dial gages has occurred. A movement of greater than 0.001 in. (0.02 mm) shall be cause to repeat the measurement process.

8. Calculations

8.1 *Tile Size*—Record all measurements in the format shown in Table 1. Measurements shall be recorded to the nearest 0.001 in. (0.02 mm) for all gages. The four rotations provide two measurements of the length and width at the center and both edges of each of the tile specimens. Report the dimensions and squareness for each specimen using the formulas in 8.2.

8.2 Perform the following calculations using Table 1 data to determine length, width, and squareness deviations for the sample tile. The final report shall include tile size, test date, and length, width, and squareness deviations.

Length and Width Deviation	Squareness Deviation
Length Deviation, Left Side = (1A+3C)/2	Corner 1 = (D1)
Length Deviation, Center = (1B+3B)/2	Corner 2 = (D2)
Length Deviation, Right Side = (1C+3A)/2	Corner 3 = (D3)
Width Deviation, Left Side = (2A+4C)/2	Corner 4 = (D4)
Width Deviation, Center = (2B+4B)/2	
Width Deviation, Right Side = (2C+4A)/2	

9. Report

9.1 Report the dimensions and squareness for each specimen using the formulas in 8.2.

10. Precision and Bias

10.1 *Precision*—The repeatability and reproducibility of this test method is in the process of being established.

10.2 *Bias*—The bias of this test method is in the process of being established.

11. Keywords

11.1 dial gage; resilient flooring; resilient tile; tile

TABLE 1 Typical Measurement Data

Rotation No.	Gage A	Gage B	Gage C	Gage D
1	0.002	0.003	–0.002	0.002
2	0.003	0.000	0.001	–0.003
3	0.004	0.001	0.003	0.002
4	0.003	0.002	0.005	–0.004

The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).