Designation: F511 – 17 (Reapproved 2021)

Standard Test Method for Quality of Cut (Joint Tightness) of Resilient Floor Tile[1]

This standard is issued under the fixed designation F511; 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 a means of measuring and evaluating the quality of cut (joint tightness) of square or rectangular resilient floor tile. Characteristics that detract from a monolithic (seamless) appearance, such as burred, chipped, nicked, or beveled edges, or bow cut or rounded corners, are measured or observed, or both.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*

F141 Terminology Relating to Resilient Floor Coverings

2.2 *ANSI Standard:*[2]

ANSI/ASQC Z1.4, *(most recent version)* Sampling Procedures and Tables for Inspection by Attributes

3. Significance and Use

3.1 Installations of resilient floor tile require tight joints if satisfactory appearance is to result. The quality of cut of resilient tile is determined by this test method.

4. Apparatus

4.1 *Shadow Box,* consisting of a backlighted poly(methyl methacrylate) (PMMA) plate measuring 28 by 28 by ⅜ in. (710 by 710 by 9.5 mm). One metal strip, 28 in. long by ¾ in. (19 mm) wide by ⅛ in. (3.2 mm) thick, and one metal strip, 27¼ in. (692 mm) long by ¾ in. wide by ⅛ in. thick, are permanently attached to the PMMA plate to form an included 90° ± 10-sec angle at the lower left-hand corner of the PMMA plate. This is suitable for tiles up to 12 by 12 in. (305 by 305 mm). For larger tiles, longer metal strips will have to be used, such that the length of each strip is greater than twice the longest dimension of the tiles to be measured.

4.2 *Optical Comparator*[3]—Power illuminated magnifier, equipped to measure to the nearest 0.001 in. (0.02 mm).

4.3 *Feeler Gauges*—As an alternative to the optical comparator described in 4.2, a set of feeler gauges with a range from 0.0015 to 0.035 in. (0.038 to 0.89 mm) for measuring to the nearest 0.001 in. (0.02 mm) may be used.

4.4 *Wire Gauges,* sized in increments of 0.005 in. (0.13 mm) from 0.005 to 0.050 in. (0.13 to 1.3 mm).

5. Sampling

5.1 Sample in accordance with ANSI/ASQC Z1.4, *most recent version*.

6. Test Specimen and Sample

6.1 The specimen (test unit) shall consist of four nominally square or rectangular tiles taken from a sample secured in accordance with ANSI/ASQC Z1.4, *most recent version*.

6.2 The required number of specimens for each test shall be indicated in the individual material specification. If no number is given, four units (the specimen) shall be taken from the sampled material and one determination made on each.

7. Conditioning

7.1 Condition the test tiles in an atmosphere maintained at 73.4 ± 3.6 °F (23 ± 1 °C) and 50 ± 10 % relative humidity for not less than 2 h prior to testing.

[1] This test method is under the jurisdiction of ASTM Committee F06 on Resilient Floor Coverings and is the direct responsibility of Subcommittee F06.20 on Test Methods.

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[2] Available from the American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.

[3] The sole source of supply of the apparatus known to the committee at this time is Titan Tool Supply Co., Inc., 68 Comet Ave., Buffalo, N.Y. 14216. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend.

7.2 Conduct tests in an atmosphere maintained at 73.4 ± 3.6 °F (23 ± 1 °C) and 50 ± 10 % relative humidity.

8. Procedure

8.1 After conditioning, place a tile from the four-tile test unit into the 90° angle formed by the two metal strips (4.1). Place the other three tiles of the test unit so as to form a four-tile square with tiles in firm contact. Do not force the tiles against each other. Normally, place each adjacent tile so that alternative tiles are at 90° to each other as regards manufacturing direction (a checkerboard design). If the tile being tested has arrows on the back and instructions call for all tile to be installed in one direction, lay the test tile on the PMMA plate in that manner. If manufacturing direction cannot be determined by a visual inspection of the tile, make the four-tile square in a random manner. Place rectangular tiles with the longer sides in the same direction to make a four-tile rectangle.

8.2 Turn on the light in the shadow box and select two points along each tile joint that show the largest opening based on the degree of light from the shadow box. Measure the width of the opening at those locations using the optical comparator. Illuminate the tile joint from above. Read the opening of the tile joint at the same location as above. Record openings for lighted-above and lighted-below measurements. Average each set of results and subtract the lighted-below result from the lighted-above result. Report the difference as bevel. The average of the lighted-above result is reported as the average joint opening.

NOTE 1—The procedure outlined in 8.2 may be performed using feeler gauges.

8.3 Using the 0.005-in. (0.13-mm) increment wire gauges, determine the maximum opening where corners of the four-tile lay-up meet.

8.4 Inspect the full length of the four tile joints using the optical comparator or a 20-power magnifier and record the appearance of the joints in accordance with 9.1.5.

8.5 Turn each tile 90° clockwise and repeat the procedure in accordance with 8.2, 8.3, and 8.4.

8.6 Repeat 8.5 until four sets of measurements have been made.

NOTE 2—The procedure outlined in 8.2 may be performed with feeler gauges instead of an optical comparator.

9. Report

9.1 Report the following information:

9.1.1 Maximum width of opening (lighted-above) between tile edges,

9.1.2 Average width of opening (lighted-above) between tile edges,

9.1.3 Average bevel. Report a zero bevel if the value is negative,

9.1.4 Maximum opening of intersection of four tile corners, and

9.1.5 Description of the general appearance of edge quality as regards burred edges, nicks, etc. Make special comment if “rockers” or “bow cuts” are observed.

10. Precision and Bias

10.1 The repeatability and reproducibility of this test method are dependent upon the ability to use and read the optical comparator or feeler gauge measuring device accurately. Typically this bias should be ±0.001 in. (0.03 mm).

NOTE 3—A more precise statement of the precision and bias cannot be made because it is not feasible to conduct a round robin evaluation of the quality of the cut due to the effects of handling that the tile receives in both a test situation and in actual use.

11. Keywords

11.1 joint tightness; quality of cut; resilient floor tile