



Designation: F2421 – 19

# Standard Test Method for Measurement of Resilient Floor Plank by Dial Gage<sup>1</sup>

This standard is issued under the fixed designation F2421; 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 establishes the procedures for determination of both dimension (length and width) and squareness of resilient floor plank. This test method is intended for use with rectangular plank up to 36 in. (915 mm).

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.* Specific precautionary statements are provided in applicable sections of this test method.

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

1.5 *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:*<sup>2</sup>

F141 Terminology Relating to Resilient Floor Coverings

2.2 *ANSI Standards:*<sup>3</sup>

ANSI/ASQC Z1.4-1993 Sampling Procedures and Tables for Inspection by Attributes

<sup>1</sup> This test method is under jurisdiction of ASTM F06 Committee on Resilient Floor Coverings and is the direct responsibility of subcommittee F06.20 on Test Methods

Current edition approved Jan. 1, 2019. Published February 2019. Originally approved in 2005. Last previous edition approved in 2011 as F2421-05 (2011). DOI: 10.1520/F2421-19.

<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.

<sup>3</sup> Available from American National Standards Institute, 25 West 43rd St., New York, NY 10036.

## 3. Terminology

3.1 *Definitions:* For definitions of terms used in this test method, refer to Terminology F141.

## 4. Significance and Use

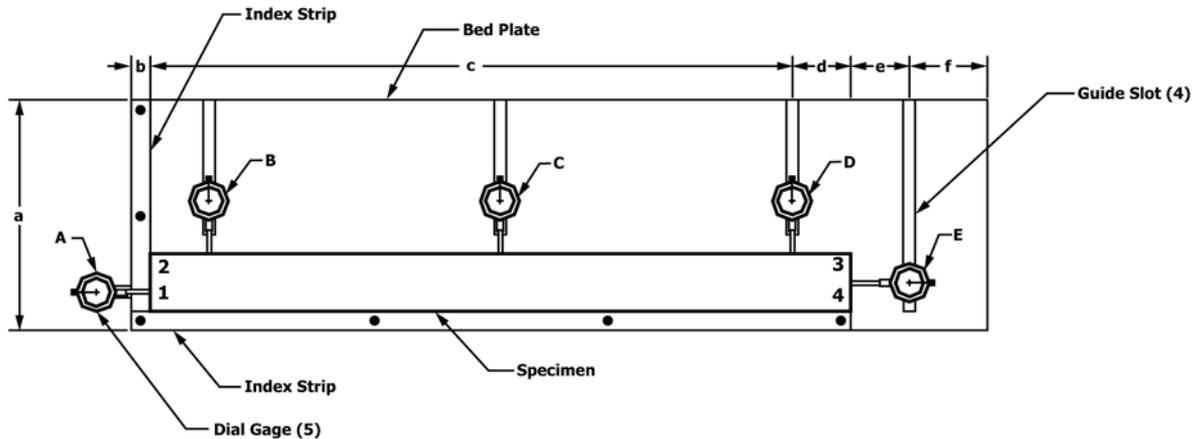
4.1 The combination of both dimensional properties and squareness of resilient floor plank is an important consideration because installed flooring may exhibit an objectionable appearance when either or both characteristics deviate from established tolerances. This test method provides a means of determining length and width dimensions along with squareness, by using a single apparatus and procedure.

## 5. Apparatus

5.1 The apparatus<sup>4</sup> shall consist of five dial gages and two reference index strips mounted on a flat bedplate in a configuration that, by rotation and flipping of the sample, allows the measurement of all four sides of resilient plank 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. The offset applies minimal pressure to the test specimen against the longer index strip to ensure repeatable measurement. A reference plate<sup>4</sup> representing target plank size and squareness (see Fig. 2) is used to zero all dial gages.

5.2 *Dial Gages*—The five dial gages are mounted in guide slots, which are machined into the bedplate to allow for measurement of various plank sizes. For the two corner gages (B & D) and the squareness gage (A) the position must be at least within 10 % of the corner edge relative to the respective length and width of the plank. For the center gages (C & E) the position must be at least within 10 % of the centerline relative to the respective length and width of the plank. Any dial gages may report measurements using either electrical or mechanical means, but shall be graduated to read to the 0.001 in. (0.025 mm) and have a stem travel greater than 0.25 in. (6.4 mm). The contact foot of the dial-gage stem shall be flat, 0.50 to 0.75 ± 0.001 in. (12.7-19.1 mm ± 0.025 mm) in diameter and exert a total force of not more than 3.0 ± 0.1ozf (0.83 ± 0.003 N). Dial gages shall be positioned securely so that when the

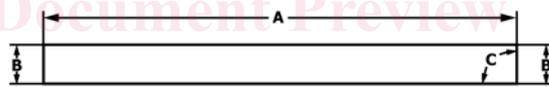
<sup>4</sup> Available from Frazier Precision Instrument Company, Inc., 925 N Sweeney Drive, Hagerstown, MD, 21740, USA.



Dimensions

	in.		mm	
	Dimension	tolerance	Dimension	tolerance
a	12		305	
b	1		25	
c	33		838	
d	3		76	
e	3		76	
f	4		102	

FIG. 1 Plank Measurement Apparatus



- A: Length Dimension  $\pm 0.001$  in (0.025 mm)
- B: Width Dimension  $\pm 0.001$  in (0.025 mm)
- C: 90 degrees  $\pm 10$ s (1.57080  $\pm 0.0005$  rad)

FIG. 2 Reference Plate

reference plate is in place, the contact foot is extended approximately 50 % of its full travel.

5.3 *Index Strips*—The apparatus contains two fixed index strips. A horizontal index strip shall be mounted parallel to and just inside the lower edge of the bedplate. It shall be  $1.5 \pm 0.1$  in. ( $38 \pm 3$  mm) greater in length and a minimum of twice the thickness of the largest plank to be tested. A second strip shall be mounted 90 degrees  $\pm 10$  s ( $1.57080 \pm 0.0005$  rad.) to the horizontal index strip. The lower end of this index strip shall be  $0.15 \pm 0.01$  in. ( $3.1 \pm 0.25$  mm) above the left end of the horizontal index strip and is used to locate one corner of the sample plank (see Fig. 1).

5.4 *Reference Plate*—The reference plate shall be made of stainless steel/aluminum to the target dimensions of the manufactured plank. The length and width dimensions shall be within 0.001 in. and the space angle shall be  $90^\circ \pm 10$  s ( $1.57080 \pm 0.0005$  rad.) to one another and are used to set the squareness and dimension gage to zero.

## 6. Specimens

- 6.1 The specimens shall consist of 5 sample planks.
- 6.2 See Fig. 3 for example of planks with profiled edges.

## 7. Sampling

7.1 For sampling, refer to ANSI/ASQC Z1.4–1993.<sup>3</sup> The inspection level shall be special inspection level S1 as noted in Table 1 and the acceptable quality level (AQL) shall be 6.5 defects per hundred units as noted in Table 11-A. The lot size shall be expressed in units. A unit represents a single, manufactured, inventoried, finished plank.

## 8. Conditioning

8.1 Condition the test specimens, apparatus, and reference plate for a minimum of 24 h at  $73.4 \pm 1.8^\circ\text{F}$  ( $23^\circ \pm 1^\circ\text{C}$ ) and  $50 \pm 5$  % relative humidity. Tests shall be conducted in this same environment. Samples shall be conditioned on a flat