Designation: E 1486M – 98 (Reapproved 2004)

METRIC

An American National Standard

Standard Test Method for Determining Floor Tolerances Using Waviness, Wheel Path and Levelness Criteria [Metric][1]

This standard is issued under the fixed designation E 1486M; 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 data collection and analysis procedures to determine surface flatness and levelness by calculating waviness indices for survey lines and surfaces, elevation differences of defined wheel paths, and levelness indices using SI units.

NOTE 1—This test method is the companion to inch-pound Test Method E 1486.

NOTE 2—This test method was not developed for, and does not apply to clay or concrete paver units.

1.1.1 The purpose of this test method is to provide the user with floor tolerance estimates as follows:

1.1.1.1 Local survey line waviness and overall surface waviness indices for floors based on deviations from the midpoints of imaginary chords as they are moved along a floor elevation profile survey line. End points of the chords are always in contact with the surface. The imaginary chords cut through any points in the concrete surface higher than the chords.

1.1.1.2 Defined wheel path criteria based on transverse and longitudinal elevation differences, change in elevation difference, and root mean square (RMS) elevation difference.

1.1.1.3 Levelness criteria for surfaces characterized by either of the following methods: the conformance of elevation data to the test section elevation data mean; or by the conformance of the RMS slope of each survey line to a specified slope for each survey line.

1.1.2 The averages used throughout these calculations are the root mean squares, RMS (that is, the quadratic means). This test method gives equal importance to humps and dips, measured up (+) and down (−), respectively, from the imaginary chords.

1.1.3 Appendix X1 is a commentary on this test method. Appendix X2 provides a computer program for waviness index calculations based on this test method.

1.2 *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 Document

2.1 *ASTM Standards:* [2]

E 1486 Test Method for Determining Floor Tolerances Using Waviness, Wheel Path, and Levelness Criteria

3. Terminology

3.1 *Descriptions of Terms Specific to This Standard:*

3.1.1 *defined wheel path traffic*—traffic on surfaces, or specifically identifiable portions thereof, intended for defined linear traffic by vehicles with two primary axles and four primary load wheel contact points on the floor and with corresponding front and rear primary wheels in approximately the same wheel paths.

3.1.2 *levelness*—described in two ways: the conformance of surface elevation data to the mean elevation of a test section, elevation conformance; and as the conformance of survey line slope to a specified slope, RMS levelness.

3.1.2.1 *elevation conformance*—the percentage of surface elevation data, h_i, that lie within the tolerance specified from the mean elevation of a test section from the mean elevation of all data within a test section. The absolute value of the distance of all points, h_i, from the test section data mean is tested against the specification, *dmax.* Passing values are counted, and that total is divided by the aggregate quantity of elevation data points for the test section, and percent passing is reported.

3.1.2.2 *RMS levelness*—directionally dependent calculation of the RMS of the slopes of the least squares fit line through successive 4.5-m long sections of a survey line, *L.* The RMS LV_L is compared to the specified surface slope and specified maximum deviation to determine compliance.

[1] This test method is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.21 on Serviceability.

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[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.

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