



Standard Practice for Calculating Pavement Macrottexture Mean Profile Depth¹

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1. Scope

1.1 This practice covers the calculation of mean profile depth from a profile of pavement macrottexture.

1.2 The mean profile depth has been shown to be useful in predicting the speed constant (gradient) of wet pavement friction.²

1.3 A linear transformation of the mean profile depth can provide an estimate of the mean texture depth measured according to Test Method E965.

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *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:*³

E178 Practice for Dealing With Outlying Observations

E965 Test Method for Measuring Pavement Macrottexture Depth Using a Volumetric Technique

2.2 *ISO Standard:*

ISO 13473-1 Acoustics—Characterization of Pavement Texture using Surface Profiles—Part 1: Determination of Mean Profile Depth⁴

¹ This practice is under the jurisdiction of Committee E17 on Vehicle - Pavement Systems and is the direct responsibility of Subcommittee E17.23 on Surface Characteristics Related to Tire Pavement Slip Resistance.

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² Wambold, J. C., Antle, C. E., Henry, J. J., and Rado, Z., International PIARC Experiment to Compare and Harmonize Texture and Skid Resistance Measurements, Final report, *Permanent International Association of Road Congresses* (PIARC), Paris 1995.

³ 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.

⁴ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, <http://www.iso.ch>.

3. Terminology

3.1 *Definitions:*

3.1.1 *baselength, n*—length of a segment of a pavement macrottexture profile being analyzed, required to be 100 mm in this practice.

3.1.2 *estimated texture depth (ETD), n*—estimate of the mean texture depth (MTD), by means of a linear transformation of the mean profile depth (MPD).

3.1.3 *mean profile depth (MPD), n*—average of all the mean segment depths of all of the segments of the profile.

3.1.4 *mean segment depth, n*—average value of the profile depth of the two halves of a segment having a given baselength.

3.1.5 *mean texture depth (MTD), n*—mean depth of the pavement surface macrottexture determined by the volumetric technique of Test Method E965.

3.1.6 *profile depth (PD), n*—difference between the amplitude measurements of pavement macrottexture and a horizontal line through the top of the highest peak within a given baselength.

4. Summary of Practice

4.1 This practice uses a measured profile of the pavement macrottexture.

4.2 The measured profile is divided for analysis purposes into segments each having a baselength of 100 mm. The slope, if any, of each segment is suppressed by subtracting a linear regression of the segment. The segment is further divided in half and the height of the highest peak in each half segment is determined. The difference between that height and the average level of the segment is calculated. The average value of these differences for all segments making up the measured profile is reported as the MPD.

5. Significance and Use

5.1 This practice is suitable for the calculation of the average macrottexture depth from profile data. The results of this calculation (MPD) have proven to be useful in the prediction of the speed dependence of wet pavement friction.²

5.2 The MPD can be used to estimate the result of a measurement of macrottexture depth using a volumetric technique according to Test Method E965. The values of MPD and