



Designation: E 1960 – 98

Standard Practice for Calculating International Friction Index of a Pavement Surface¹

This standard is issued under the fixed designation E 1960; 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 practice covers the calculation of the International Friction Index (IFI) from a measurement of pavement macrotexture and wet pavement friction. The IFI was developed in the PIARC International Experiment to Compare and Harmonize Texture and Skid Resistance Measurements. The index allows for the harmonizing of friction measurements with different equipment to a common calibrated index.

1.2 The IFI consists of two parameters that report the calibrated wet friction at 60 km/h (F60) and the speed constant of wet pavement friction (S_p).

1.3 The mean profile depth (MPD) and mean texture depth (MTD) have been shown to be useful in predicting the speed constant (gradient) of wet pavement friction.²

1.4 A linear transformation of the estimated friction at 60 km/h provides the calibrated F60 value. The estimated friction at 60 km/h is obtained by using the speed constant to calculate the estimated friction at 60 km/h from a measurement made at any speed.

1.5 The values stated in SI (metric) units are to be regarded as standard. The inch-pound equivalents are rationalized, rather than exact mathematical conversions.

1.6 *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:

E 867 Terminology of Vehicle-Pavement Systems³

¹ This practice is under the jurisdiction of Committee E-17 on Vehicle-Pavement Systems and is the direct responsibility of Subcommittee E17.23 on Surface Characteristics Related to Tire-Pavement Friction.

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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 *Annual Book of ASTM Standards*, Vol. 04.03.

E 965 Test Method for Measuring Pavement Macrotexture Depth Using a Volumetric Technique³

E 1911 Test Method for Measuring Paved Surface Frictional Properties using the Dynamic Friction Tester³

E 1845 Practice for Calculating Pavement Macrotexture Mean Profile Depth³

2.2 ISO Standard:

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

3. Terminology

3.1 Terminology used in this standard conforms to the definitions included in Terminology E 867.

4. Summary of Practice

4.1 This practice uses measured data of the pavement surface on: (1) macrotexture, and (2) measured friction (FRS) on wet pavement. The practice accommodates these data measured with different equipment at any measuring speed.

4.2 Measurement of the pavement macrotexture is used to estimate the speed constant (S_p).

4.3 The measured friction (FRS) at some slip speed (S) is used with the speed constant of the pavement (S_p) to calculate the friction at 60 km/h (FR60) and a linear regression is used on FR60 to find the calibrated friction value at 60 km/h (F60).

4.4 F60 and S_p are then reported as IFI (F60, S_p).

5. Significance and Use

5.1 This is the practice for calculating the IFI of the pavement. The IFI has proven useful for harmonization of the friction measuring equipment. F60 and S_p have proven to be able to predict the speed dependence of wet pavement-related measurements of the various types of friction-measuring equipment.² The two IFI parameters (F60 and S_p) have been found to be reliable predictors of the dependence of wet pavement friction on tire slip and vehicle speed.

⁴ Draft International Standard under the jurisdiction of ISO/TC43/SC1 currently under ballot.