



# Standard Practice for Calculating International Friction Index of a Pavement Surface<sup>1</sup>

This standard is issued under the fixed designation E1960; 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 ( $\epsilon$ ) 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. This practice provides for harmonization of friction reporting for devices that use a smooth tread test tire.

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) has been shown to be useful in predicting the speed constant (gradient) of wet pavement friction.<sup>2</sup>

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.*

<sup>1</sup> This practice is under the jurisdiction of Committee E17 on Vehicle - Pavement Systems and is the direct responsibility of Subcommittee E17.21 on Field Methods for Measuring Tire Pavement Friction.

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<sup>2</sup> 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.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>3</sup>

E867 Terminology Relating to Vehicle-Pavement Systems  
E1911 Test Method for Measuring Paved Surface Frictional Properties Using the Dynamic Friction Tester  
E1845 Practice for Calculating Pavement Macrotexture Mean Profile Depth

### 2.2 ISO Standard:

DIS 13473-1 Acoustics – Characterization of Pavement Texture using Surface Profiles – Part 1: Determination of Mean Profile Depth<sup>4</sup>

## 3. Terminology

3.1 Terminology used in this standard conforms to the definitions included in Terminology E867.

## 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

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

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