



Standard Test Method for Measuring the Frictional Properties of Winter Contaminated Pavement Surfaces Using an Averaging-Type Spot Measuring Decelerometer¹

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1. Scope

1.1 This test method covers the measurement of the frictional properties of winter contaminated pavement surfaces using an averaging-type spot measuring decelerometer. The method produces a reading that is proportional to the deceleration sustained by a test vehicle fitted with pneumatic rubber tires braking with all wheels locked. A friction index for a section of winter contaminated pavement is determined from the average of several deceleration measurements recorded over the section of winter contaminated pavement.

1.2 This test method is applicable to averaging-type spot measuring decelerometers.

1.3 This test method is applicable to the following winter contaminated pavement surface conditions:

1.3.1 Ice;

1.3.2 Wet ice (ice covered with a thin film of moisture of a depth insufficient to cause hydroplaning);

1.3.3 Compacted snow, any depth;

1.3.4 Slush on ice, slush not exceeding 3 mm (0.1 in.) in depth;

1.3.5 Loose, dry snow, not exceeding 25 mm (1 in.) in depth;

1.3.6 Ice control chemical solution on ice; and

1.3.7 Sand on ice.

1.4 This test method shall not be used when the following winter contaminated pavement surface conditions are present:

1.4.1 Water on a bare pavement surface;

1.4.2 Slush; and

1.4.3 Loose snow exceeding 25 mm (1 in.) in depth.

1.5 The values stated in SI units are to be regarded as the standard. The values in parentheses are in inch-pound units and are not exact equivalents, therefore, each system must be used independent of the other, without combining values in any way.

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 Relating to Vehicle-Pavement Systems²

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms, refer to Terminology E 867.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *averaging-type spot measuring decelerometer, n*—a spot measuring decelerometer that measures the average rate of deceleration of a test vehicle during braking.

3.2.2 *g*—a unit of acceleration where 1 g is equal to the acceleration of gravity, 9.8 m/s² (32.2 ft/s²).

3.2.3 *spot measuring decelerometer, n*—a device used to measure vehicle deceleration on roads and runway surfaces.

4. Summary of Test Method

4.1 A spot measuring decelerometer is placed in a test vehicle so that the decelerometer can measure the deceleration of the vehicle during braking.

4.2 The test vehicle is accelerated over a section of winter contaminated pavement and the brakes are applied firmly to cause all the wheels to lock.

4.3 The friction coefficient developed between the pavement surface and the vehicle is directly related to the deceleration of the vehicle recorded by the decelerometer when the deceleration is reported in g units.

5. Significance and Use

5.1 Knowledge of the frictional properties of a winter contaminated pavement surface is essential to evaluate the braking effort of ground vehicles or aircraft operating on a pavement surface. The presence of contaminants on a pavement surface will affect the frictional properties of the surface in a manner which is difficult to evaluate by visual observation alone. The frictional properties of a winter contaminated pavement surface can be characterized using a spot measuring decelerometer which provides a measurement of the surface friction and assists with the evaluation of pavement winter maintenance requirements.

¹ This test method is under the jurisdiction of ASTM Committee E17 on Vehicle-Pavement Systems and is the direct responsibility of Subcommittee E17.22 on Friction Measurement of Traveled Surfaces Under Winter Conditions.

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² *Annual Book of ASTM Standards*, Vol 04.03.