



Standard Guide for Validating New Area Reference Skid Measurement Systems and Equipment¹

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1. Scope

1.1 This guide covers validating area reference skid measurement systems (ARSMS) and related equipment. These systems have been used since 1976 to evaluate and correlate Test Method [E274](#) skid measurement systems used primarily as a pavement management tool by state Departments of Transportation. Also, this guide provides guidelines for the revalidation process following the replacement of components within an ARSMS.

1.2 This guide is offered as a process to identify and quantify the variables that affect system performance, to minimize the effect of these variables, and to provide a method of validating a new ARSMS to replace an existing ARSMS that has provided quality correlation data for a very long time.

1.3 The values stated in inch-pound units are to be regarded as the standard since the ARSMS will be compared with state departments of transportation systems that all currently use inch-pound units. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.4 *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:²

- [E274](#) Test Method for Skid Resistance of Paved Surfaces Using a Full-Scale Tire
- [E501](#) Specification for Rib Tire for Pavement Skid-Resistance Tests

¹ This guide is under the jurisdiction of ASTM 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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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.

- [E556](#) Test Method for Calibrating a Wheel Force or Torque Transducer Using a Calibration Platform (User Level)
- [E867](#) Terminology Relating to Vehicle-Pavement Systems
- [F377](#) Practice for Calibration of Braking/Tractive Measuring Devices for Testing Tires
- [F457](#) Test Method for Speed and Distance Calibration of Fifth Wheel Equipped With Either Analog or Digital Instrumentation

3. Terminology

3.1 Definitions:

3.1.1 Terminology used in this guide conforms to the definitions in Terminology [E867](#).

4. Summary of Guide

4.1 There are three phases to the process of validating new ARSMS equipment. Phase One is the calibration of all the equipment and instrumentation to be used in this process. Phase Two addresses the variables associated with the determination of a skid number (SN) and attempts to quantify the impact that each variable may have upon the accurate determination of an SN. Phase Three is the dynamic validation process, based upon the variables confirmed in Phase Two.

4.2 The approach is based upon Test Method [E274](#) but with much narrower tolerances and greater control of the many potential variables. The extra effort is required since the products are measurement tools which will be used to evaluate the variety of Test Method [E274](#) systems.

4.3 It is anticipated that the SN data produced by the two existing ARSMS and the SN data produced by each of the new ARSMS will have no significant difference.

4.4 The following three-phase procedural guide identifies the individual components or pieces, the evaluation process for each item, and the expected results.

5. Significance and Use

5.1 Friction characteristics of traveled surfaces are monitored by skid measurement systems, and the operating procedure for the use of these systems is Test Method [E274](#). However, dynamic measurement differences between these systems, that comply with the requirements of Test Method