
Standard Method of Test for Surface Frictional Properties Using the British Pendulum Tester

AASHTO Designation: T 278-24

Technically Revised: 2024

Editorially Revised: 2024

Technical Subcommittee: 5a, Pavement Measurement

ASTM Designation: E303-22



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1.

SCOPE

- 1.1.
- This method covers the procedure for measuring surface frictional properties using the British Pendulum Skid Resistance Tester. A method for calibration of the tester is included in Annex A.
- 1.2.
- The British Pendulum Tester is a dynamic pendulum impact-type tester used to measure the energy loss when a rubber slider edge is propelled over a test surface. The tester is used for laboratory as well as field tests on flat surfaces and polish value measurements on curved laboratory specimens from accelerated polishing wheel tests.
- 1.3.
- The value measured, British Pendulum (Tester) Number (BPN) for flat surfaces and polish values for accelerated polishing wheel specimens, represents the frictional properties obtained with the apparatus and procedures stated herein and does not necessarily agree or correlate with other slipperiness measuring equipment results.
- 1.4.
- This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*
- 1.5.
- The quality of the results produced by this standard is dependent on the competence of the personnel performing the procedure and the capability, calibration, and maintenance of the equipment used. Agencies that meet the criteria of R 18 are generally considered capable of competent and objective testing/sampling/inspection/etc. Users of this standard are cautioned that compliance with R 18 alone does not completely assure reliable results. Reliable results depend on many factors; following the suggestions of R 18 or some similar acceptable guideline provides a means of evaluating and controlling some of those factors.*

2.

REFERENCED DOCUMENTS

- 2.1.
- AASHTO Standards:
 - M 261, Rib-Tread Standard Tire for Special-Purpose Pavement Frictional-Property Tests
 - R 18, Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
- 2.2.
- Other Document:

■ Giles, C. G., B. E. Sabey, and K. W. F. Carden. Development and Performance of Portable Skid-Resistance Tester. In *Road Research Technical Paper No. 66*. Road Research Laboratory, Department of Scientific and Industrial Research, Crowthorne, England, 1964.

3. SUMMARY OF METHOD

- 3.1. This method consists of using a pendulum-type tester with a standard rubber slider to determine the frictional properties of a test surface.
- 3.2. The test surface is cleaned and thoroughly wetted prior to testing.
- 3.3. The pendulum slider is positioned to barely contact a specific length of the test surface prior to conducting the test. The pendulum is raised to a locked position, then released to propel the slider across the test surface.
- 3.4. A drag pointer indicates the BPN. The term pendulum test value (PTV) is synonymous with the PBN in the pedestrian surface industry. The greater the friction number between the slider and the test surface, the more the swing is retarded and the larger the BPN reading. Five swings of the pendulum are made for each test surface.

4. SIGNIFICANCE AND USE

- 4.1. This method provides a measure of a frictional property or microtexture of surfaces, either in the field or in the laboratory.
- 4.2. This method may be used to determine the relative effects of various polishing techniques on materials or material combinations.
- 4.3. The values measured in accordance with this method do not necessarily agree or directly correlate with those obtained utilizing other methods of determining friction properties or skid resistance.
Note 1—BPN and polish values from similar types of surfaces will not be numerically equal, primarily because of the differences in slide length and surface shape. Theoretical correction of the polish values to obtain numerical equality, either by mathematical manipulation or by use of special measuring scales, is not recommended.

5. APPARATUS

- 5.1. *British Pendulum Tester (Figure 1)*—The pendulum with slider and slider mount shall weigh 1500 ± 30 g. The distance of the center of gravity of the pendulum from the center of oscillation shall be 16.2 ± 0.2 in. (411 ± 5 mm). The tester shall be capable of vertical adjustment to provide a slider contact path of from $4\frac{7}{8}$ to 5.0 in. (124 to 127 mm) for tests on flat surfaces and $2\frac{15}{16}$ to $3\frac{1}{16}$ in. (75 to 78 mm) for tests on polishing wheel specimens. The spring and lever arrangement shown in Figure 2 shall give an average normal slider load between the 3-in. (76-mm) wide slider and test surface of 2500 ± 100 g as measured by the method prescribed in the Annex.

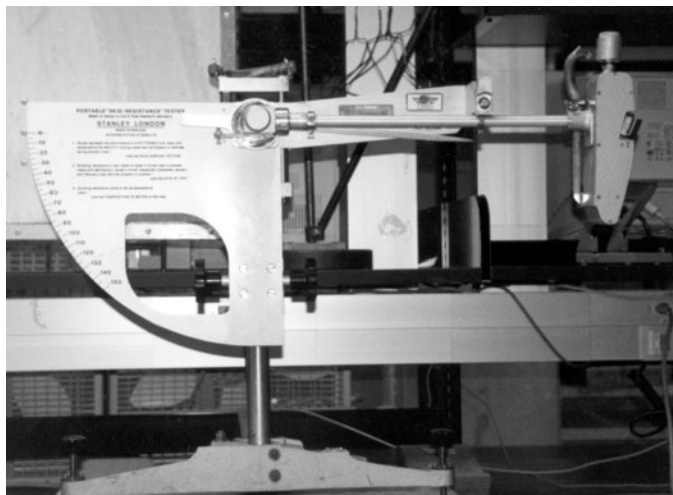


Figure 1—British Pendulum Tester