
Standard Method of Test for Accelerated Polishing of Aggregates Using the British Wheel

AASHTO Designation: T 279-18 (2022)

Technically Revised: 2018

Reviewed but Not Updated: 2022

Editorially Revised: 2021

Technical Subcommittee: 5a, Pavement Measurement

ASTM Designation: [D3319-11\(2017\)](#)



**American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, DC 20004**

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1. SCOPE

- 1.1. This method covers a laboratory procedure by which an estimate may be made of the extent to which different coarse aggregates may polish.
- 1.2. The values stated in SI units are regarded as the standard.
- 1.3. *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 users of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*
- 1.4. *The quality of the results produced by this standard are 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
 - [R 90](#), Sampling Aggregate Products
 - [T 278](#), Surface Frictional Properties Using the British Pendulum Tester
- 2.2. *ASTM Standards:*
- [C778](#), Standard Specification for Standard Sand
 - [D1415](#), Standard Test Method for Rubber Property—International Hardness
- 2.3. *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. TERMINOLOGY

- 3.1. *Definitions:*
 - 3.1.1. *initial friction value (PV-i)*—the initial British Pendulum Tester readings on the test specimens before they are polished in the accelerated polishing machine.
 - 3.1.2. *polish value (PV-n)*—a measure of the state of polish reached by a test specimen subjected to the specified hours (*n*) of accelerated polishing using the materials, equipment, and procedures described in this method. The measurement is made using the British Pendulum Tester as described in Section 5.3 and [T 278](#).
 - 3.1.3. *residual polish value (RPV-n)*—the residual polish value is obtained when a constant PV-*n* is achieved four consecutive times with repeated swings of the pendulum.

4. SIGNIFICANCE AND USE

- 4.1. This test method simulates the polishing action of vehicular traffic on coarse aggregates used in bituminous pavements.
- 4.2. A polish value is determined that may be used to rate or classify coarse aggregates for their ability to resist polishing under traffic.

5. APPARATUS

- 5.1. *Accelerated Polishing Machine*¹—An accelerated polishing machine, also known as the British Wheel, and based on a 1958 design by the Road Research Laboratory of Great Britain. This machine shall be mounted on a firm, rigid, and level base. The equipment shall include the following:
 - 5.1.1. *Cylindrical Wheel*—Hereafter referred to as the road wheel, and having a flat surface periphery and of such size and shape as to permit 14 specimens described below to be clamped onto the periphery to form a continuous surface of aggregate particles, 44.45 mm (1³/₄ in.) wide and 406.4 mm (16 in.) in diameter.
 - 5.1.2. A means of rotating the road wheel about its own axis at a speed of 320 ± 5 rpm.
 - 5.1.3. A means of bringing the surface of a rubber-tired wheel 203.2 mm (8 in.) in diameter and 50.8 mm (2 in.) wide to bear on the aggregate specimens mounted on the surface of the road wheel with a total load of 391.44 ± 4.45 N (88 ± 1 lbf). The tire shall be treated, if necessary, to obtain a true running surface. The tire shall be free to rotate about on its own axis, which shall be parallel to the axis of the road wheel. The plane of rotation of the tire shall coincide with that of the road wheel. Before a new tire is used on a test, it should be conditioned by a preliminary run of 6 h with a 150-grit silicon carbide using dummy specimens (extra or used) on the road wheel.
 - 5.1.3.1. *Alternate Tire No. 1*—An industrial 8 by 2 pneumatic smooth-tread hand-truck tire (Note 1). The tire rubber hardness shall be 55 ± 5 IRHD measured in accordance with [ASTM D1415](#). The tire shall be inflated to a pressure of 310.26 ± 13.79 kPa (45 ± 2 psi).