



Standard Practice for the Accelerated Polishing of Aggregates Using the British Wheel¹

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1. Scope

1.1 This practice covers a laboratory procedure by which an estimate may be made of the extent to which different coarse aggregates may polish.

1.2 *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.*

1.3 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

C 778 Specification for Standard Sand²

D 75 Practice for Sampling Aggregates³

D 1415 Test Method for Rubber Property—International Hardness⁴

E 303 Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester³

E 501 Specification for Standard Rib Tire for Pavement Skid-Resistance Tests³

3. Terminology

3.1 Definitions:

3.1.1 *initial friction value, n*—the initial British Pendulum Tester readings on the test specimens before they are polished in the accelerated polishing machine.

3.1.2 *polish value, n*—a measure of the state of polish reached by a test specimen subjected to accelerated polishing using the materials, equipment, and procedures described in this method. The measurement is made using the British Pendulum Tester as described in 5.3 and Test Method E 303.

4. Significance and Use

4.1 This practice 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*⁵—An accelerated polishing machine, also known as the British Wheel, and based upon 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, 1¾ in. (44.45 mm) wide and 16 in. (406.4 mm) 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 8 in. (203.2 mm) in diameter and 2 in. (50.8 mm) wide to bear on the aggregate specimens mounted on the surface of the road wheel with a total load of 88 ± 1 lbf (391.44 ± 4.45 N). The tire shall be treated, if necessary, to obtain a true running surface. The tire shall be free to rotate about its own axis, which should 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 shall 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 handtruck tire (Note 1). The tire rubber hardness shall be 55 ± 5 IRHD measured in accordance with Test Method D 1415. The tire shall be inflated to a pressure of 45 ± 2 psi (310.26 ± 13.79 kPa).

NOTE 1—This is the tire originally supplied with the Accelerated Polishing Machine⁵ and known by the tire manufacturer's designation Dunlop RLI 8 by 2. Dunlop discontinued manufacturing of this tire in February 1979. It is retained as an alternate in this practice for those users who may still have a supply and in the event that Dunlop should resume manufacturing it in the future.

⁵ Available from Wessex Engineering and Metal Craft Co., Ltd., Merchants Barton, Frome, Somerset, England.

¹ This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.51 on Aggregate Tests.

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² *Annual Book of ASTM Standards*, Vol 04.01.

³ *Annual Book of ASTM Standards*, Vol 04.03.

⁴ *Annual Book of ASTM Standards*, Vol 09.01.