Designation: C 1028 – 06

Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method[1]

This standard is issued under the fixed designation C 1028; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the measurement of static coefficient of friction of ceramic tile or other surfaces under both wet and dry conditions while utilizing Neolite heel assemblies.[2] This test method can be used in the laboratory or in the field.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information purposes only.

1.3 *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 *Rubber Manufacturing Association (RMA) Standard:*

HS-3 Method of Test for Evaluating Adhesive Bondability of Shoe Soling Materials (1975)[3]

3. Terminology

3.1 *Definitions:*

3.1.1 *coefficient of friction*—the ratio of the horizontal component of force required to overcome or have a tendency to overcome friction to the vertical component of the object weight or normal force applied through the object which tends to cause the friction.

3.1.2 *friction*—the resistance developed between the physical contacting surface of two bodies when there is movement or tendency for movement of one body relative to the other parallel to the plane of contact.

3.1.3 *static coefficient of friction*—the ratio of the horizontal component of force applied to a body that just overcomes the friction or resistance to slipping to the vertical component of the weight of the object or force applied to it.

4. Significance and Use

4.1 The horizontal dynamometer pull meter and heel assemblies are designed to determine the static coefficient of friction of tile and like materials.

4.2 The measurement made by this apparatus is believed to be one important factor relative to slip resistance. Other factors can affect slip resistance, such as the degree of wear on the shoe and flooring material; presence of foreign material, such as water, oil, and dirt; the length of the human stride at the time of slip; type of floor finish; and the physical and mental condition of humans. Therefore, this test method should be used for the purpose of developing a property of the flooring surface under laboratory conditions, and should not be used to determine slip resistance under field conditions unless those conditions are fully described.

4.3 Because many variables may enter into the evaluation of slip resistance of a particular surface, this test method is designed to evaluate these surfaces under both laboratory and actual site installation conditions.

4.4 The static coefficient of friction is determined under both wet and dry conditions with Neolite heel assemblies over both unprepared and prepared (cleaned) test surfaces.

5. Apparatus

5.1 *Dynamometer Pull Meter*, horizontal capable of measuring 100 lbs.-force (lbf.), accurate to 0.1 lbf., and capable of holding the peak value. (see Fig. 1).

5.2 *Weight*, 50-lb (22-kg) Weight shall be either cylindrical (approximately 6 in. in diameter and approximately 8 in. tall) or of rectangular dimensions with the base measuring approximately 6 by 8 in. Weight must be stable, and have a uniform distribution of weight. (see Fig. 2).

[1] This test method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Products and is the direct responsibility of Subcommittee C21.06 on Ceramic Tile.

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[2] Neolite or an equivalent has been found satisfactory. Neolite is a registered trademark of the Goodyear Tire and Rubber Co., Shoe Product Division, Windsor, VT 05089 and may be obtained from Smithers Scientific Services, Inc., 425 W. Market St., Akron, OH 44303 (Attn: Technical Director). Specify "Neolite (Break-in Compound)," RMA Spec. HS-3, Size 36 by 44 in., 6 irons, Color: Natural 11, Specific Gravity 1.27 ± 0.02, Hardness Shore A93-96.

[3] Available from Rubber Manufacturers Association, 1901 Pennsylvania Ave., NW, Washington, DC 20006. RMA Specification #HS-3.

(a)

(b)

FIG. 1 Dynamometer Pull Meters

5.3 *Standard Neolite Sled Assemblies*, two, one to be used for each of the wet and dry conditions.

5.3.1 Two assemblies, constructed from 8 by 8 by ¾-in. 6061-T6 aluminum plate or similar material, with 3 by 3 by ⅛-in. Neolite material attached to the aluminum plate with contact adhesive.

5.3.2 Sheen must be removed from the Neolite surface prior to use. To prepare the assembly surface prior to initial use:

5.3.2.1 Place a sheet of 400 grit wet or dry silicon carbide paper (attached to a flat surface, such as a piece of float glass) on a flat and stable surface.

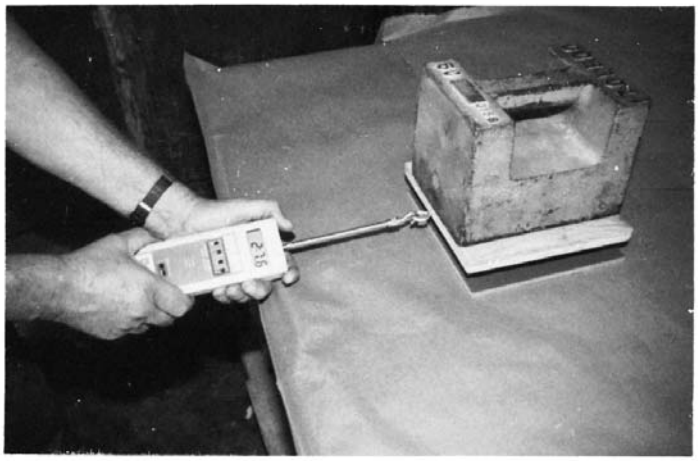

FIG. 2 Test Assembly

5.3.2.2 Sand Neolite material by moving the assembly once across the sandpaper towards the operator for a distance of about 4 in. (102 mm) while applying between 15-20 lbs-force to the assembly,

5.3.2.3 Remove the sled assembly and brush off any accumulated Neolite dust from the silicon carbide paper and sled assembly using a dry brush; brush to be such that it effectively removes the Neolite dust but causes no damage to the silicon carbide paper or the Neolite on the sled assembly.

5.3.2.4 Rotate the sled 90° (clockwise) and sand the Neolite again with the same procedure (one single pull towards the operator followed by removing the Neolite dust is considered one stroke).

5.3.2.5 Repeat sanding in this fashion (rotating the sled assembly by 90°, clockwise, and brushing off the Neolite dust each time between strokes) for a total of eight (8) strokes. Eight strokes equals one (1) resurfacing cycle.

5.3.2.6 Continue sanding the Neolite until all the sheen (glossy surface produced during the manufacturing process) is removed, usually no more than 500 strokes.

5.4 *Standard Tile.*

6. Reagents and Materials

6.1 *Silicon Carbide Paper*, wet or dry, 400 grit.

6.2 *Renovator,*

6.3 *Neolite,*[2] Standard Neolite Cement Liner (see 2.1).

6.4 *Rags, Sponge, or Paper Towels*.

6.5 *Water*, distilled.

7. Calibration (Dry)

7.1 Because many variables are associated with this test procedure, it is important that the operator calibrates the Neolite Heel Assembly surface with the Standard Tile each time the test is performed.

7.2 For uses other than the initial use, resurface the assembly with 400 grit wet or dry silicon carbide paper, four cycles.

7.3 Determine the total weight, *W*, of the 50-lb (22-kg) weight plus the Neolite Heel Assembly.

7.4 Clean the Standard Tile with a renovator.