FLORIDA DEPARTMENT OF TRANSPORTATION
State Materials Office
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FLORIDA METHOD OF TEST FOR WEAR RESISTANCE OF SURFACE APPLIED DETECTABLE WARNING SURFACES

Designation: FM 5-594

1. SCOPE

1.1 This method covers the determination of wear resistance of Detectable Warning Surfaces (mat) by use of a linear abrading technique. This test method defines abrasive wear by determining volume loss for the domes of these materials.

1.2 This method does not address safety concerns, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. SUMMARY OF TEST METHOD

2.1 This method defines sampling, sample preparation, and testing using a specific load, speed, and number of cycles under an abrasive material of specified coarseness. The volume loss is calculated using the change in weight, due to abrasion, and the density of the dome material.

3. APPARATUS

3.1 Taber® Industries' Linear Abraser - Model 5750 (or equivalent) equipped with variable speed control, stroke length, cycle counter, and Slotted T-Table with (2) Clamps. (See Figure 1)

Figure 1 Example of commercially available linear abrasion equipment

3.2 Standard H-18 (.25" diameter) Calibrade Wearaser® (or equivalent abrading tip)

3.3 Wearaser® Diamond Grit Refacer/Sharpener

3.4 Soft Brush

3.5 Supplemental weights to equal 1100 g total load.

3.6 Balance, having a sensitivity of +/- 0.1 mg.

4. SAMPLING

4.1 Sampling should be taken randomly from the manufacturer's process. Eight test specimens shall be obtained. Take two specimens from each quadrant of the mat, one from the interior and one from the perimeter. Label specimens and record locations.

5. TEST SPECIMEN

5.1 Each test specimen shall contain a dome at the center and have enough material around the dome to clamp onto the Slotted T-Table. The test specimen should be no larger than 2.5 by 2.5 in. The edges shall be free of any lose burrs, fibers, or fragments. The specimen shall be free of dirt, debris or other contaminants.

6. PROCEDURE

6.1 Review equipment operations manual before testing.

6.2 Weigh a test specimen. Record the sample number and the initial weight to the nearest 0.1 mg.

Note 1: It is important to weigh, abrade and reweigh the test specimen within a 30 minute period in order to minimize the variability found in balances when weighing non-metallic materials.

6.3 Set parameters of the abrading equipment to the following:

A) Speed = 60 cycles per minute
B) Cycles = 500
C) Stroke Length = 0.5 inches

6.4 Place the abrading tip into the collet assembly. Ensure the abrading tip is new or freshly refaced (refer to Step 6.7). Place the crank arm to the left most position when facing the instrument. Mount the test specimen on the table and clamp in position such that the abrading tip will stay on top of the dome for the entire stroke length. Lower the spline shaft assembly on to the dome. Place the supplemental weights on the shaft for a total load of 1100 grams.

6.5 Start the abrading equipment. Adjustments to the abrading tip may need to be made during the test to ensure adequate length. If an adjustment is needed, maintain the orientation of the abrading tip to the specimen wear pattern.

6.6 Remove the test specimen from the table and brush away debris. Reweigh and record to the nearest 0.1 mg.

6.7 The abrading tip must be refaced or replaced in between each test specimen. Refacing is accomplished with the abrading equipment using the following parameters:

A) Speed = 25 cycles per minute
B) Cycles = 10 minimum or until the surface is refreshed
C) Stroke Length = 0.5 inch

Ensure the abrading tip is positioned correctly in the collet assembly for refacing. Place the crank arm to the left most position when facing the instrument. Place the refacer on the table and clamp. Lower the spline shaft assembly. DO NOT USE supplemental weights. Start the abrading equipment. Remove the abrading tip to check for freshness. Repeat step 6.7, if necessary. If the surface is acceptable, taper the edges using the sharpener on the refacer.

Note 2: A fresh surface shall be free of debris or other worn material from previous testing. The contact surface of the abrading tip shall be smooth and flat.

6.8 Repeat this procedure (6.2 - 6.7) for the remaining test specimens.

7. CALCULATIONS

7.1 $\Delta W = W_i - W_f$

7.2 $\Delta V = \frac{\Delta W}{\rho}$

7.3 $\overline{V} = \frac{\sum_1^n \Delta V}{n}$

Where: W_i = Initial Weight (g)
W_f = Final Weight (g)
V = Volume (cm^3)
ρ = Density (g/cm^3)
n = Number of Samples

8. Report

Report the following:

A) Manufacturer, type and size of mat tested,

B) Location of test specimens in the mat,

C) The Individual and Average Volume Loss for (8) test specimens.