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| Recommended Approval: <u>Suzanne Brant</u> 3/1/12<br>Assistant Division Chief Date<br><u>David J. Odom</u> 03/01/2012<br>Division Chief Date | Maryland Department of Transportation<br>State Highway Administration<br>Office of Materials Technology<br><b>MARYLAND STANDARD METHOD OF TESTS</b> |                              |
| Approved: <u>Tim Smith</u> 03/09/12<br>Director Date   | <b>MEASURING FRICTIONAL<br/>         PROPERTIES OF AGGREGATES<br/>         USING THE DYNAMIC FRICTION<br/>         TESTER</b>                       | <b>MSMT<br/>         216</b> |

**SCOPE:**

The method is used to measure the frictional properties of aggregates in the laboratory or field using the Dynamic Friction Tester (DFT). The DFT is a portable device used for measuring the coefficient of friction ( $\mu$ ) of a surface as a function of sliding speed.

**REFERENCES:**

- E1911 Standard Test Method for Measuring Paved Surface Frictional Properties Using the Dynamic Friction Tester
- MSMT 215 Laboratory Method of Polishing Aggregates Using the Circular Track Polishing Machine

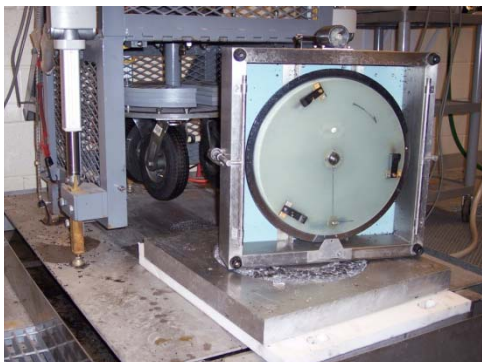
**MATERIALS AND EQUIPMENT:**

1. Dynamic Friction Tester (DFT).
2. Dynamic Friction Controller
3. Water Supply
4. Synthetic Rubber Sliders
5. Computer
6. DFT Worksheet
7. Polished aggregate sample prepared per MSMT 215.

**TEST PROCEDURE:**

1. Calibrate the DFT per ASTM E1911 and the manufacturer's specifications.
2. Ensure the rubber sliders were manufactured less than 12 months prior to use. Do not conduct more than twelve tests with a set of sliders. Replace the rubber sliders prior to testing.
3. Enter project information onto DFT Worksheet.

4. Fill the water supply and open the flow valve on the side of the tank. Ensure the water supply is at least 2 feet above the DFT for proper water flow. Also, lift the hose above the water supply to remove any air bubbles that may hinder the flow. Then, attach the water hose to the end of the DFT.
5. Connect the power and signal cables from the controller to the DFT. Ensure the power connection is off the ground and away from the water.
6. Connect the controller to the 12V DC power supply or car battery with the proper power cord.

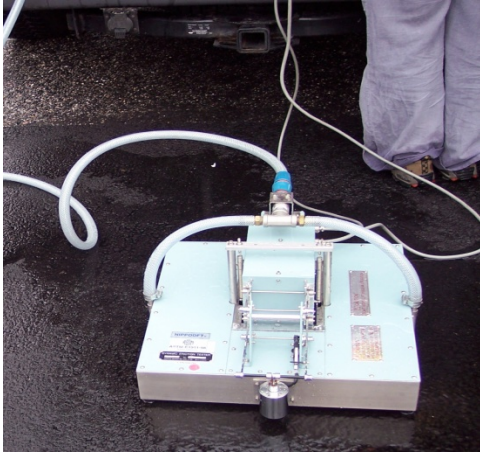


**Figure 1**  
View of rotating disk and sliders

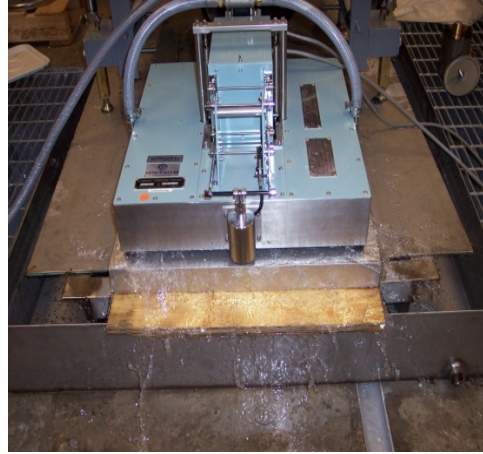


**Figure 2**  
DFT Controller

7. Use a brush to clean the pavement or laboratory sample of loose particles; then thoroughly rinse the test area or sample.
8. Carefully place the DFT on a level section of the pavement to be tested. Mark the test area so the DFT can be placed on the same spot for subsequent readings. For samples polished per MSMT 215, place the feet of the DFT on the 4 circular markings on the mold.
9. Switch the controller on and wait for the menu to appear. Then select the “Measurement” option.
10. Use the arrow key and select “Auto” as the type of testing.
11. Using proper ear protection, start the DFT by pushing the handle down. The disk will start to spin and will drop into testing position at 80 km/hr. Once the disk stops, a curve of coefficient vs. speed will be shown on the DFT controller screen.
12. Record the DFT readings at speeds at 20, 40, and 60 km/hr. Enter the counter and friction test results on the DFT Worksheet. The data is also stored in the controller.



**Figure 3**  
Field Testing



**Figure 4**  
Laboratory Testing

13. Transfer the data from the controller to the computer as described in Step 14. Then perform four additional readings.

14. Data transfer procedure:

- a. Press F9 – “Data Received”
- b. Click on “Connection”
- c. Within 10 seconds click “Transfer to Measurement Data”, then click “OK/Go”
- d. Press F1 – “Start Transfer”
- e. Within 10 seconds click “Go” (timing is critical for proper data transfer)

**Note:** Refer to the D. F. Tester Instruction Manual for problems related to the DFT or the controller.

**REPORT:**

Refer to the Dynamic Friction Testing Worksheet.

Maryland State Highway Administration  
Office of Materials Technology – Soils and Aggregate Technology Division

**DYNAMIC FRICTION TESTING WORKSHEET**

**Contract No.:** \_\_\_\_\_ **Producer:** \_\_\_\_\_ **Start Date:** \_\_\_\_\_  
**Log No.:** \_\_\_\_\_ **Location:** \_\_\_\_\_ **End Date:** \_\_\_\_\_  
**Sample No.:** \_\_\_\_\_ **Tested by:** \_\_\_\_\_

| DFT Test No. | DFT File Name | Date | Counter Reading @Start | Counter Reading @End | Friction Reading @20 km/hr | Friction Reading @40 km/hr | Friction Reading @60 km/hr | New Slider?<br>(y/n) | New Tire(s)?<br>(y/n) | Remarks |
|--------------|---------------|------|------------------------|----------------------|----------------------------|----------------------------|----------------------------|----------------------|-----------------------|---------|
| 1            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 2            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 3            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 4            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 5            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 1            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 2            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 3            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 4            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 5            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 1            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 2            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 3            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 4            |               |      |                        |                      |                            |                            |                            |                      |                       |         |
| 5            |               |      |                        |                      |                            |                            |                            |                      |                       |         |