

Recommend Approval: <u>Robert A. Vachon</u> 8/24/18 Assistant Division Chief Date <u>Chris</u> 8/24/18 Division Chief Date	Maryland Department of Transportation State Highway Administration Office of Materials Technology MARYLAND STANDARD METHOD OF TESTS	
Approved: <u>Sybil B. Smith</u> 09/12/18 Director Date	<b>VOLUMETRIC PAVEMENT MACROTEXTURE DEPTH TEST</b>	<b>MSMT 413</b>

### **SCOPE:**

This procedure is used to evaluate the macrotexture of milled and finished pavement surfaces.

### **REFERENCE DOCUMENTS:**

E 965 Standard Test Method for Measuring Pavement Macrotexture Depth Using a Volumetric Technique

### **MATERIALS AND EQUIPMENT:**

1. Type 1 Glass beads conforming to M 247.
2. A class B or better, style III, 250 mL capacity graduated cylinder per E 1272 used to measure the volume of glass beads for the test.
3. A flat, stiff hard disk with a diameter of 2.5 to 3.0 in. and a thickness of 1.0 in. used to spread the glass beads.

**NOTE:** An ice hockey puck is considered suitable for use as a spreader for this test.

4. A stiff wire brush or a soft bristle brush to clean the pavement.
5. A small container with a secure and easily removable cover in order to store 200 ml (12.2 in<sup>3</sup>) of glass beads.
6. A shield to protect the test area from air turbulence by the wind or traffic.

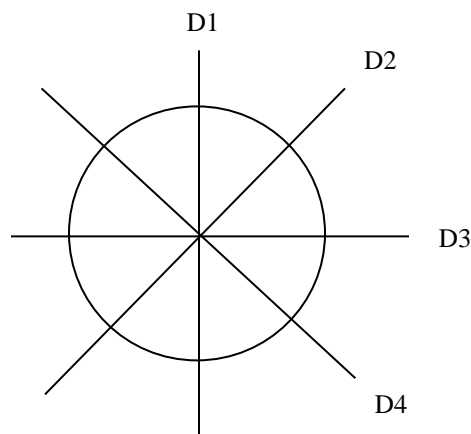
### **TEST PROCEDURE:**

#### **MILLED SURFACE**

1. Prepare a container with 200 ml (12.2 in<sup>3</sup>) of glass beads for each test location. Fill the graduated cylinder to the specified volume. Gently tap the side of the graduated cylinder to level the surface of the glass beads. Place the measured volume of glass beads in the container.
2. Label the container with the type and quantity of glass beads.
3. Select a random test location on the milled pavement surface, which is dry, homogenous, free of cracks, joints, stripping and patching.
4. Clean the test location using the brushes to remove any residue, debris or loosely bonded

material.

5. Place the screen on the milled pavement surface to protect the test location from air turbulence.
6. Place the container filled with glass beads at a height not greater than 4 inches from the milled pavement.
7. Pour the glass beads from the container onto the milled pavement surface in a conical pile.
8. Place the spreader on top of the glass bead pile without pushing down.
9. Move the spreader in a slow, circular motion to disperse the glass beads.
10. Continue spreading the glass beads until well dispersed and the spreader circulates on top of the high points of the milled pavement surface.
11. Measure and record the diameter of the circular area four times, at intervals of  $45^{\circ}$  and to the nearest 0.5 inches as shown in Figure 1.



**Figure 1**

**TEST PROCEDURE:**

**FINISHED SURFACE**

1. Prepare one container with 25 ml (1.53 in<sup>3</sup>) of glass beads for each test location. Fill the graduated cylinder to the specified volume. Gently tap the side of the graduated cylinder to level the surface of the glass beads. Place the measured volume of glass beads in the container.

2. Label the container with the type and quantity of glass beads.
3. Select a random test location on the finished pavement surface, which is dry, homogenous, free of cracks, joints, stripping and patching.
4. Clean the test location using the brushes to remove any residue, debris or loosely bonded material.
5. Place the screen on the finished pavement surface to protect the test location from air turbulence.
6. Place the container filled with glass beads at a height not greater than 4 inches from the finished pavement.
7. Pour the glass beads from the container onto the finished pavement surface in a conical pile.
8. Place the spreader on top of the glass bead pile without pushing down.
9. Move the spreader in a slow, circular motion to disperse the glass beads.
10. Continue spreading the glass beads until well dispersed and the spreader circulates on top of the high points of the finished pavement surface.
11. Measure and record the diameter of the circular area four times, at intervals of 45° and to the nearest 0.5 inches as shown in figure 1.

### **CALCULATIONS:**

1. Calculate the average diameter of the circular area covered by the glass beads by the following formula:

$$D_{avg} = \frac{D1+D2+D3+D4}{4}$$

Where:

$D_{avg}$  = Average diameter of the glass beads area, to the nearest 0.5 in.

D1, D2, D3, D4 = Diameter of the glass beads area measured at each of the four locations, in.

*Optional* – Calculate the macrotexture of the milled surface by the following formula:

$$MTD = \frac{4*V}{\pi*(D_{avg})^2}$$

Where:

MTD = Mean Texture Depth, in.  
V = Volume of glass beads, in<sup>3</sup>

**REPORT:**

1. Date of test
2. Name of Technician
3. Milling Contractor / Type of Milling (Standard, Fine, Micro or Finished Surface)
4. Contract number
5. Route Number/ Route Name
6. Station and Offset of test location
7. Diameter measurements of glass beads area, D1, D2, D3, D4
8. Average diameter of glass beads area, in.
9. Mean Texture Depth, to the nearest 0.001 in. (*Optional*)

**Appendix A**

**VOLUMETRIC PAVEMENT MACROTEXTURE DEPTH TEST  
REPORT**

Contract No.: \_\_\_\_\_ Route No./Route Name: \_\_\_\_\_

Milling Contractor: \_\_\_\_\_

Type of Milling (Standard, Fine, Micro or Finished Surface): \_\_\_\_\_

Technician Name (Printed): \_\_\_\_\_

Date	Station	Offset	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)	Da (in.)

\_\_\_\_\_  
Technician Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
SHA Inspector Signature

\_\_\_\_\_  
Date