



## **MEAN MACROTEXTURE DEPTH OF MILLED PAVEMENT**

(A Modification of Indiana Test Method 812-03T and ASTM E 965)

### **1. SCOPE**

(a) This test method describes the procedure to determine the Mean Macrot texture Depth of a milled pavement surface.

(b) This test method may involve hazardous material, operations, or equipment. This test method does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and determine the applicability of any regulatory limitations prior to use.

(c) See Appendix A1 of the Materials Testing Manual for information regarding the procedure to be used for rounding numbers to the required degree of accuracy.

### **2. APPARATUS**

(a) The apparatus shall consist of the following:

(1) Filler - Type 1 glass beads conforming to the requirements of AASHTO M 247.

(2) Spreader - A flat, stiff, hard disk made from methyl methacrylate (Plexiglas) with a thickness of  $0.5 \pm 0.1$  inch, and a diameter of 8 inches  $\pm 1/4$  inch, with a handle attached to the top of the disk.

(3) Graduated Cylinder - Class B or better, Style III, 250 mL capacity graduated cylinder conforming to the requirements of ASTM E 1272, used to measure the amount of filler required for the test.

(4) Brushes - A stiff wire brush and a soft bristle brush, used to clean the pavement.

(5) Container - Small container, with a secure and easily removable cover, used to store 200 mL of filler.

(6) Wind Screen - A shield used to protect the test area from air turbulence created from wind or traffic.

(7) Measuring device - A tape measure, or ruler at least 12 inches long, graduated in at least 1/8 inch increments. A tape measure, or ruler at least 300 millimeters long, graduated in millimeter increments may be used if desired.

### **3. PREPARATION OF FILLER MATERIAL**

(a) For each test location, one container with 200 mL of filler is prepared as follows:

(1) Fill the graduated cylinder to the 200 mL mark and gently tap the base of the cylinder several times on a rigid surface. Add more material to fill the graduated cylinder to the 200 mL mark. Gently tap the side of the cylinder to level the material. As necessary, add additional material, tap, and level until the filler is at the 200 mL mark.

(2) Place the measured amount of filler in the container.

### **4. PROCEDURE**

(a) Randomly select a test location.

(b) Inspect the selected test location and ensure that it is dry, uniform, and free of unique or localized features such as cracks, joints, stripping, and patching. Clean the test location using the brushes to remove any residue, debris, or loosely bonded material. Position the wind screen around the test location.

(c) Holding the container above the test location at a height not greater than 4 inches from the pavement surface, pour the measured amount of filler into a conical pile on the test area.

(d) Lightly place the spreader on top of the conical pile, being careful not to compact the filler.

(e) Using the spreader, carefully spread the material into a circular patch filling the surface voids flush with the top of the milled pavement.

(f) Measure and record the diameter of the circular patch at four locations (intervals of 45°) to the nearest 1/8 inch. Convert each reading to the nearest millimeter (1 inch = 25.4 millimeters). If desired, measurements may be taken directly in millimeters and recorded to the nearest millimeter.

Example: (For a reading of 9-3/8")

$$9\text{-}3/8" = 9.375"$$

$$9.375" \times 25.4 = 238.125 \text{ millimeters} =$$

238 millimeters (rounded to the nearest millimeter)

## 5. CALCULATIONS

(a) Calculate the average diameter of the circular patch as follows:

$$D_a = \frac{D_1 + D_2 + D_3 + D_4}{4}$$

Where:

$D_a$  = Average diameter of the circular patch, nearest millimeter

$D_1, D_2, D_3, D_4$  = Individual diameters of the circular patch, nearest millimeter

(b) Using the average diameter of the circular patch, determine the Mean Macrottexture Depth by referencing Figure 1. The values for Mean Macrottexture Depth shown in Figure 1 have been determined using the equation for Mean Macrottexture Depth shown below. When necessary, use the equation to determine the Mean Macrottexture Depth for average diameters outside the range of values given in Figure 1.

Since: Volume = (Area) x (Height, or Depth)

Therefore: Height, or Depth =  $\frac{\text{Volume}}{\text{Area}}$

$$\text{so: Mean Macrottexture Depth, mm} = \frac{V}{(\pi) \times \left(\frac{D_a}{2}\right)^2}$$

Where:  $V$  = Volume of glass beads, 200,000 mm<sup>3</sup> (200 mL)

$D_a$  = Average diameter of the circular patch, mm

## 6. REPORT AND EXAMPLE

(a) An example of a completed Mean Macrottexture Depth test report is provided in Figure 2.

(b) A blank Mean Macrottexture Depth test report form is provided in Figure 3.

<b>MEAN MACROTEXTURE DEPTH            (Based on 200 mL of Glass Beads and Average Diameter)</b>					
<b>Average Diameter (mm)</b>	<b>Mean Macrotecture Depth (mm)</b>	<b>Average Diameter (mm)</b>	<b>Mean Macrotecture Depth (mm)</b>	<b>Average Diameter (mm)</b>	<b>Mean Macrotecture Depth (mm)</b>
185	7.44	222	5.17	259	3.80
186	7.36	223	5.12	260	3.77
187	7.28	224	5.08	261	3.74
188	7.20	225	5.03	262	3.71
189	7.13	226	4.99	263	3.68
190	7.05	227	4.94	264	3.65
191	6.98	228	4.90	265	3.63
192	6.91	229	4.86	266	3.60
193	6.84	230	4.81	267	3.57
194	6.77	231	4.77	268	3.55
195	6.70	232	4.73	269	3.52
196	6.63	233	4.69	270	3.49
197	6.56	234	4.65	271	3.47
198	6.50	235	4.61	272	3.44
199	6.43	236	4.57	273	3.42
200	6.37	237	4.53	274	3.39
201	6.30	238	4.50	275	3.37
202	6.24	239	4.46	276	3.34
203	6.18	240	4.42	277	3.32
204	6.12	241	4.38	278	3.29
205	6.06	242	4.35	279	3.27
206	6.00	243	4.31	280	3.25
207	5.94	244	4.28	281	3.22
208	5.89	245	4.24	282	3.20
209	5.83	246	4.21	283	3.18
210	5.77	247	4.17	284	3.16
211	5.72	248	4.14	285	3.14
212	5.67	249	4.11	286	3.11
213	5.61	250	4.07	287	3.09
214	5.56	251	4.04	288	3.07
215	5.51	252	4.01	289	3.05
216	5.46	253	3.98	290	3.03
217	5.41	254	3.95	291	3.01
218	5.36	255	3.92	292	2.99
219	5.31	256	3.89	293	2.97
220	5.26	257	3.86	294	2.95
221	5.21	258	3.83	295	2.93

**FIGURE 1**

**MEAN MACROTEXTURE DEPTH  
 ARIZONA TEST METHOD 742**

TRACS Number: H999901C Roadway: Heraz Canyon - Lee's Bluff Contractor: Happy Days Construction

Test #	Date	Station	Offset	D <sub>1</sub> (mm)	D <sub>2</sub> (mm)	D <sub>3</sub> (mm)	D <sub>4</sub> (mm)	D <sub>a</sub> (mm)	Mean Macrotexture Depth	Spec.	Pass (✓)	Fail (✓)
1	03-25-08	351+62	4' Rt. of CL	248	239	245	236	242	4.35	≤4.50	✓	
2	03-25-08	373+16	6' Rt. of CL	255	263	250	259	257	3.86	"	✓	
3	03-25-08	402+42	10' Rt. of CL	241	246	237	248	243	4.31	"	✓	
4	03-25-08	429+53	7' Rt. of CL	247	259	251	254	253	3.98	"	✓	
5	03-25-08	456+87	3' Rt. of CL	263	260	257	253	258	3.83	"	✓	
<b>EXAMPLE</b>												

(03/18/08)

**FIGURE 2**

MEAN MACROTEXTURE DEPTH  
ARIZONA TEST METHOD 742

TRACS Number:	Roadway:	Station	Date	Offset	D <sub>1</sub> (mm)	D <sub>2</sub> (mm)	D <sub>3</sub> (mm)	D <sub>4</sub> (mm)	D <sub>a</sub> (mm)	Mean Macrotexture Depth	Spec.	Pass (✓)	Fail (✓)

FIGURE 3

(03/18/08)