Racing Surfaces Testing Laboratory

2 Summer St. Unit 1
Orono, ME 04473
207.866.1046

LABORATORY TEST METHOD FOR HYDROMETER FOR RACING SURFACE MATERIALS (ASTM D422)

Note:
This procedure applies to dirt only. All material must be completely free from wax and other synthetic materials. See the "Wax Separation" and "Rubber & Fiber Separation" procedures.

1) Place 1 bottle (1 gallon) of **distilled water** into a constant-temperature water bath at least 8 hours prior to the hydrometer test. Check that the water level in the water bath is near the top and add more water if necessary. If not using a water bath, place the distilled water in the location where the test will take place.

2) Dry at least 100g of material. Refer to the Moisture Removal & Determination Procedure for details.

3) Place the model 152H **hydrometer** in a **1000-mL cylinder** of distilled water. This water should be replaced at least every eight hydrometer tests, or if it is noticeably dirty.

4) Get a clean **250 mL beaker**. Using the **±0.01 g scale**, add 5.00 g of **sodium hexametaphosphate** (dispersant).

5) Add 100g of oven dried material (bulk) to the 250 mL beaker. Record the mass of the sample on the data sheet under "Sample Mass". If more than 50% of the sample is smaller than the No. 200 sieve, add only 50g of material to the beaker. If the percent smaller than the No. 200 sieve is not known, but it is suspected that more than 50% of the sample is smaller than the No. 200 sieve, prepare two samples: one with 100g of material and one with 50g of material. If the first reading with the 100g sample is >50g/L, use the 50g sample.

6) Mix the sample and the dispersant.

7) Add 125 mL of distilled water to the beaker and mix thoroughly. Rinse the stirrer into the beaker with distilled water to prevent loss of soil.

8) Allow the mixture to soak for at least 16 hours (overnight).

9) After 16 hours of soaking, pour the soil/water/dispersant mixture into the clean **stainless steel mixer cup**. Use distilled water to rinse all material from the beaker into the mixer cup. Add distilled water until the cup is about 1/2 full. Mix with the **mixer** on "low" for 2 minutes.

10) On the data sheet under "Top of Meniscus Fm" write 6.2 g/L if it doesn't say that already. This is the density of the dispersant and distilled water mixture at 20°C. It will be used to calculate the amount of soil still in suspension.

11) When mixing is complete, pour the soil/water/dispersant mixture into a 1000 mL cylinder. Again, use distilled water to transfer all material from the mixing cup to the sedimentation cylinder. Add distilled water until the water level reaches 1000 mL.

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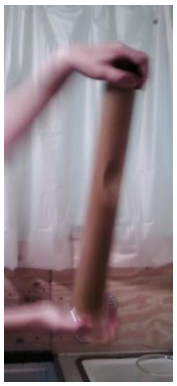
12) Cover the top of the cylinder with a **rubber stopper**. Mix the water and soil by turning it upside down and right side up thirty times during one minute (60 flips total). During the first few flips, be sure to break free any material that may have stuck to the bottom of the cylinder.



13) Start the timer right after the 60 flips and work quickly to place the sedimentation cylinder into the constant-temperature tank (or on the counter if not using a water bath) and remove the rubber stopper.

14) Take and record hydrometer readings at time intervals of 1, 2, 5, 15, 30, 60, 250, and 1440 minutes. To take a hydrometer reading, gently place the hydrometer into the top of the sedimentation cylinder so that it is just below the level you expect the reading to be at. Allow the hydrometer to sit for 20 seconds before taking a reading at the top of the meniscus to the nearest 0.1 g/L.

15) After each reading, gently remove the hydrometer and clean by placing it into the cylinder of distilled water and twirling it gently or by spraying it off with distilled water and wiping dry with a paper towel. Then, gently insert a thermometer into the suspension and record the temperature.

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Revision No.	Date	Revision By	Description
1.0	22-Jul-2009	RB & MS	Created and issued procedure
1.1	02-Nov-2010	L. Flanders	Added notes from handwritten sheet in procedure folder
1.2	13-JAN-2011	M. Segee	removed reference cylinder steps, added Parafilm.
1.3	21-Jan-2011	W. Luo	Added step 1, modified step 3
1.4	14-Mar-2011	M. Segee	changed amount of sample from 100g to 50g
1.5	24-Apr-2012	M. Segee	Clarified sample preparation, changed reference value from 7.5 to 8
1.6	23-Nov-2012	A. Eguren	Clarified sample preparation, changed reference value from 8 to 6.2
1.7	06-Jun-2013	M. Segee	Added cell labels from datasheet
1.8	11-Jun-2013	M. Segee	What to do if percent fines not known when prepping sample
2.0	28-Jun-2013	M. Segee	Add pictures, rinse hydrometer in cylinder of distilled water
2.1	9-Jul-2013	M. Segee	Broke sample prep into more steps. Rearranged steps for clarity
2.2	28-Apr-2014	H. Babbitt	Reviewed procedure, updated lab address