Racing Surfaces Testing Laboratory

2 Summer St. Unit 1
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LABORATORY TEST METHOD FOR DETERMINATION OF PARTICLE DISTRIBUTION IN SYNTHETIC RACING SURFACE MATERIALS (ASTM D2974)

Note:
This procedure applies to synthetic material only.

1) Obtain the sample in the material beakers of wax separation (refer to 'Laboratory Test Method To Determine Wax Content In Synthetic Racing Surface Materials')

2) Place **No.10 sieve** on the top of the **pan**.

3) Pour the entire sample into the No.10 sieve.

4) Stack the rest of the **sieves** on the top of the No.10 sieve. Cover the sieve stack with the **sieve cap**. Check that there are no loose bolts on the **sieve shaker**. Put the stack into the shaker then run the machine.

5) Fill three **crucibles** with material from the pan. Label and number each crucible. Then put them into the **muffle furnace**.

6) Put the remaining material in the pan as well as the material retained on the No. 10 sieve into a **plastic bag** labeled with the sample identifier, the sample description, "Dewaxed material, some sand removed", the date, and the initials of the person bagging the sample. The sample should be put into the project bucket.

7) After placing the crucibles in the muffle furnace set it to the "8.0" setting during heat-up. Press the green start button on the **timer**. It will take approximately 45 - 60 min to reach the desired temperature of 825°F (440°C). When the furnace has reached 800°F to 850°F, turn the dial setting to a setting between "4.6" and "4.8" and press the start button again.

8) Important: 1) do not let the temperature inside the furnace exceed 900°F otherwise there is the risk that the sand particles may crack, and 2) DO NOT OPEN the muffle furnace while it is at temperature as the crucible will be exposed to thermal shock.

9) The timer will turn off the furnace automatically after 10 hours have elapsed. Allow the furnace to cool completely to room temperature with DOOR CLOSED. Cool-down time is approx. 4 hours.

10) Check that the sand is completely free of fiber, rubber, and jelly cable. If it is not, repeat steps 6-8. (Most samples must be burned twice). After the organic material is completely burned off weigh the crucibles and do the sieve separation.

11) Record the mass of each sieve using a **scale accurate to ±0.1g**. Sort sieves from coarsest mesh on top to finest mesh on bottom (10, 14, 40, 60, 100, 140, 200, Pan in descending order). The higher the sieve number, the finer the mesh. Note that we have a separate sieve stack for synthetic material. The sieves which should be used for sieve separation with synthetic material are marked with an 'S.'

12) Pour the burned-off material into the top sieve. Care should be used when pouring to prevent the loss of very fine particles to the air. Place the sieve cap onto the top sieve.

13) Place the stack of sieves into the shaker, set the hammer on top of the sieve cap, and close the clasp. Check the sieve shaker for loose bolts. Start the shaker by pressing the red button above the shaker. The machine will run for 5 minutes.

14) Remove the sieve stack from the shaker. Separate the #10 sieve from the sieve stack and record the mass of the sieve + material. Continue to record the mass of each sieve all the way down to the pan. Handle the finer particle sizes (#140 and finer) with care as these particles tend to become free-floating dust easily.

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15) Remember to do microscopy if it is needed.

16) After all the sieve masses are recorded, pour the contents of each sieve into the pan or another container. Put this material in a plastic bag labeled with the sample identifier, the sample description, “sand after sieve”, the date, and the initials of the person bagging the sample. This bag should be put back in the project bucket.

Revision No.	Date	Revision By	Description
1.0	27-Jan-2010	J. Luo	Created and issued procedure
1.1	13-Jan-2011	M. Segee	Combined with sieve separation procedure
1.2	24-Apr-2012	M. Segee	Added burn-off directions instead of directing to organic procedure
1.3	31-May-2012	M. Segee	Check sieve shaker for loose bolts.
1.4	9-Aug-2013	M. Segee	Clarified steps
1.5	25-Mar-2014	H. Babbitt	Clarified Steps, updated lab address