

# Racing Surfaces Testing Laboratory

2 Summer St. Unit 1  
Orono, ME 04473  
207.866.1046



## LABORATORY TEST METHOD FOR ABRASION RESISTANCE OF RACING SURFACE SAND MATERIALS USING MICRO-DEVAL APPARATUS (ADAPTED FROM ASTM D7428)

*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) Weigh 600g of as received sand material. If it is suspected that the material is more than 20% fines, use more material.
- 2) Get a No. 200 sieve (75 micron).
- 3) Place the weighed sand material in a plastic container (pan or vessel) that can hold the sample and add sufficient tap water to cover the sample.
- 4) Agitate the container vigorously to bring the fine material into suspension. Take care to avoid spilling of any material. A deep plastic container is recommended to prevent loss of sand and water.
- 5) Immediately pour the wash water over the No. 200 sieve.
- 6) Add a second charge of water to the sample in the plastic container and repeat steps 4 through 6 until the wash water is clear.
- 7) Get a clean sample tin. Check that it is free from holes.
- 8) Transfer the washed sample in the plastic container to a smaller sample tin using a spoon.
- 9) Flush the plastic container and spoon thoroughly using a wash bottle to move all retained material to the sample tin.
- 10) Flush all material retained on the sieves to the sample tin using a wash bottle.
- 11) Decant excess water from the sample tin over the No. 200 sieve if needed and flush the sieve to make sure all sample material is returned to the sample tin.
- 12) Place the sample tin in a  $110 \pm 5^\circ\text{C}$  oven and allow to dry to constant mass for 12 hours.
- 13) Check that the calibration date for the Micro-Deval stainless steel balls and jars. If more than one week has passed, they may need to be recalibrated. See "Micro-Deval Maintenance" for details about calibration.
- 14) Mix the dried sample in the sample tin with a spoon.
- 15) Weigh an empty sample tin with a scale accurate to  $\pm 0.1\text{g}$  and record the weight under "Empty Container (g)" and "Before Grinding."
- 16) Add  $500 \pm 5\text{g}$  dried sample to the empty sample tin and record the mass to  $\pm 0.1\text{g}$  under "Container + Washed and Dried Sample to be Ground (g)" and "Before Grinding."
- 17) Pour the entire weighed sample into a Micro-Deval jar.
- 18) Use a graduated cylinder to measure  $750 \pm 5\text{mL}$  tap water. Pour the water into the Micro-Deval jar and make sure the sample is immersed.
- 19) Allow the sample and water to sit for at least 60 min. While the sample is soaking, check that the reflective decal on the jar lid and the encoder on the Micro-Deval machine are not damaged or dirty. Do not clean either with anything abrasive.
- 20) After the sample and water have soaked for at least 60 min, add  $1250 \pm 5\text{g}$  stainless steel balls to the jar. Record the mass of the balls added to the jar to the nearest 0.1g under "Ball Oven Dry Weight Before Grinding (g)."
- 21) Install and tighten the jar lid. Make sure the lid is centered and that the reflective decal is clearly visible.
- 22) Invert the jar and check the lid for leaks.
- 23) Place the jar on the machine.

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- 24) Run the machine for  $1500 \pm 10$  revolutions. There are directions on the machine on how to change the set-point if it is not correct.
- 25) Wash the container of step 3 and put a No. 4 sieve in it.
- 26) Carefully pour the sample and steel balls over the No. 4 sieve.
- 27) Use water to flush all the material out of the jar.
- 28) Wash the stainless steel balls retained on the sieve, then remove the balls and the sieve from the plastic container

- 29) Oven dry the balls at  $110 \pm 5^\circ\text{C}$  for 2 hours, then weigh them and record the mass under "Ball Oven Dry Weight After Grinding (g)."
- 30) Repeat steps 2 through 6 with the sample from the jar.
- 31) Weigh a clean sample tin to the nearest 0.1g and record the mass under "Empty Container (g)" and "After Grinding."
- 32) Move the washed sample to the clean sample tin and dry it, as described in steps 8-12.
- 33) Weigh the rewashed and oven dried sample to the nearest 0.1g and record the mass under "Container + Washed and Dried Sample after Grinding (g)."

Revision No.	Date	Revision By	Description
1.1	22-May-2012	M. Segee	put procedure in dropbox, clarified and altered some steps.
1.2	6-Aug-2013	M. Segee	Clarified steps, use plastic container instead of Teflon coated metal pan, added data sheet labels.