Racing Surfaces Testing Laboratory

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LABORATORY TEST METHOD FOR pH DETERMINATION OF RACING SURFACE SOIL MATERIALS

Notes:
This procedure applies only to dirt surfaces, and not to surfaces that contain wax, rubber, or fibers.
Refer to: HANNA Instruments: Instruction Manual HI9125, HI9125 Portable Waterproof pH meters.
ASTM International: D 4972-01 Standard Test method for pH of soils.

1) Place at least 100g in oven to remove moisture. Refer to the moisture removal procedure for details.

2) Clean two empty 250 mL beakers with alcohol then rinse with distilled water. Dry with a clean paper towel. Place one beaker upside down on a clean paper towel.

3) Place one beaker on a scale accurate to ±0.01g and tare the scale.

4) Add 100g ±1g of material to a 250 mL beaker using the scupula or spoon that was just cleaned. Record the weight of the material under "Sample mass".

5) Add 100g ±1g of distilled water so the weight of the material in the beaker and the weight of the sample in the beaker are the same, creating a "1:1 suspension". Record the weight of the water added under "Water mass."

6) Mix for 30 seconds with the clean scupula. **DO NOT** rinse the scupula into the beaker. Cover with plastic wrap to avoid dust contamination.

7) Place beaker in a place where it will not be disturbed by vibration for 1 hour (on the mantel or in the hydrometer test area). This allows the sand particles to settle from the suspension and air to leave the solution.

8) Remove the pH tester from its case. Remove the cover from the end of the pH electrode. There should be storage solution in the cover which keeps the electrode wet. If there is no solution in the cover or if the bulb is dry (do not touch the bulb to check) the electrode must be submerged in storage solution for at least 1 hour before it can be used.

9) Inspect the electrode and cable. The cable must be intact and no cracks should be seen on the electrode stem or bulb. If any scratches or cracks are present replace the electrode.

10) Connect the pH electrode and the temperature probe to the BNC and temperature sockets on the top of the Hanna Instruments pH tester. Make sure both sides of both connections are clean and dry before the connections are made.

11) Check the calibration date on the pH tester. If over 1 week has based since the last calibration, the pH tester should be recalibrated. See "Hanna Instruments pH Tester Calibration" on the following page.

12) Add "electrode cleaning solution" to the remaining clean 250 mL beaker. Dip the pH tester in it, and then spray it with distilled water and allow most of the water to drip off before taking the measurement.

13) Dip the electrodes into the water mixture without touching the surface of the settled soil, and slowly stir the electrode in the solution. The goal is to create a small flow across the probes. Allow the reading to equilibrate up to 60 seconds before recording the measurement.

14) When it has stabilized, record the final temperature under "temperature (probe reading)" and total dissolved solids reading under "Total dissolved solids in liquid above settled soil (probe reading)."

15) If taking readings on multiple samples, be sure to spray the pH electrode and temperature probe with distilled water before taking readings on the next sample.

16) Pour a small amount of storage solution into the electrode cap before storing it

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Hanna Instruments pH Tester Calibration

1) Clean 5 100 mL beaker using the procedure outlined in (2) above.

2) Pour a small quantity of electrode cleaning solution into one of the clean 100 mL beakers, and dip the electrode and temperature probe in the solution. Rinse both with distilled water and set aside.

3) Connect the pH electrode and the temperature probe to the pH tester.

4) Pour a small amount of 7.01 buffer solution into two of the clean 100 mL beakers. If the buffer solution is older than 3-4 months, dispose of the solution and open a new bottle.

5) Turn on the tester and press the CAL key. The "CAL" and "BUF" indicators will be displayed. The secondary LCD will display buffer "7.01". If "7.01" is not displayed, press the up or down arrow until 7.01 appears.

6) Quickly dip the pH electrode and temperature probe into one of the 7.01 buffer solution beakers to rinse them, and then transfer them into the second beaker to continue the calibration. Submerse the electrode bulb completely when performing the calibration. Place the temperature probe closely to the electrode and stir gently. The LCD will flash the "WAIT NOT READY" message until the reading is stable. If it is not close to the selected buffer "WRONG" and "WRONG BUF" will blink alternatively. If it is close to the selected buffer the display will change to a blinking "READY".

7) When the tester if blinking "READY" press the CFM key to confirm the calibration set point. The calibrated reading is then displayed on the LCD. The second buffer to be used for calibration will be displayed on the second line. The secondary buffer the tester requests is 4.01. If this buffer is not going to be used, use the arrow keys to adjust the buffer.

8) Pour a small quantity of 4.01 buffer solution into the two remaining clean 100 mL beakers. If the buffer solution is older than 3-4 months, dispose of the solution and open a new bottle.

9) Quickly dip the pH electrode and the temperature probe into one of the 4.01 buffer solution beakers to rinse them, and then transfer the probes into the second beaker to continue the calibration. the electrode bulb completely when performing the calibration. Place the temperature probe closely to the electrode and stir gently. The LCD will flash the "WAIT NOT READY" message until the reading is stable. If it is not close to the selected buffer "WRONG" and "WRONG BUF" will blink alternatively. If it is close to the selected buffer the display will change to a blinking "READY".

10) When the tester if blinking "READY" press the CFM key to confirm the calibration set point. When the reading is confirmed, the value is stored in memory, and the meter returns to normal mode.

11) Dilute the solutions used for calibration, and then dispose of them in the sink.

12) Pour a small amount of storage solution into the electrode cap before storing it.

NOTE: If using a 10.01 buffer solution for calibration, ensure that the solution is no older than one month. Once opened, the carbon dioxide in the atmosphere will cause the true value to drift overtime.

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Revision No.	Date	Revision By	Description
1.0	05-May-2016	T. Thomson	Created and issued procedure
2.0	19-June-2017	K. Dempsey	Added buffer solution information, and probe calibration/procedure corrections for accurate measurements.
2.1	26-Feb-19	H.Adams	Update address and phone number
2.2	19-Mar-2025	M. Rockefeller	Update address