

## Colorado Procedure – Laboratory 4216-10

### *Standard Method of Test for*

## Determination of Salt Content of Sanding Materials

(Designated as CP 34 prior to the 2010 FMM.)

### 1. SCOPE

- 1.1 This procedure covers the extraction of salt from the salt-aggregate sanding materials to determine salt content.

### 2. PREPARATION OF SPECIMEN

- 2.1 The sample from which the specimen is selected shall be obtained by usual stockpile sampling method. The specimen shall be reduced to test size in accordance with CP 32. The specimen size shall be governed by nominal particle size in the mixture as used in CP 31.

### Method A - Vacuum Extractor

### 3. APPARATUS

- 3.1 *Vacuum extractor* - Complete with vacuum pump, gasket, filter paper, support plate, and funnel ring.
- 3.2 *Filter paper*, 5 to 40 micrometer.
- 3.3 *Oven or hot plate*.
- 3.4 *Stainless steel beaker*, approximately 9 qt. (9 L) capacity.
- 3.5 *Plastic wash bottle*.
- 3.6 *Drying pan*.
- 3.7 *Mixing spoon*, approximately 12" (300 mm) long.
- 3.8 *Balance or Scale* - Balance of sufficient capacity and sensitive to 0.1 grams or 0.02 percent of the principal sample weight, whichever is greater.

**4. SAFETY**

4.1 Drain extractor immediately after use.

**5. PROCEDURE**

5.1 Split sample into a test portion of proper size. Either dry the entire sample to a constant weight (mass) in a  $230^{\circ}\text{F} \pm 9^{\circ}$  ( $110^{\circ}\text{C} \pm 5^{\circ}$ ) oven or on a hotplate; or split the sample into two test portions of proper size, using one portion for moisture correction. Dry the moisture correction portion to a constant weight (mass) in a  $230^{\circ}\text{F} \pm 9^{\circ}$  ( $110^{\circ}\text{C} \pm 5^{\circ}$ ) oven or on a hotplate. Determine the percent moisture.

5.2 Place test specimen in a tared stainless steel beaker and weigh to nearest 0.1g.

5.3 Pour an adequate quantity of water over the specimen so that all salt will dissolve and agitate thoroughly. Allow specimen to soak for a least 16 hours at  $175^{\circ}\text{F} \pm 9^{\circ}$  ( $80^{\circ}\text{C} \pm 5^{\circ}$ ). Stir the sample a minimum of three times during the soak. Alternatively to soaking for 16 hours at  $175^{\circ}\text{F} \pm 9^{\circ}$  ( $80^{\circ}\text{C} \pm 5^{\circ}$ ), place the specimen and water on stove or hot plate and heat the mixture so that the water boils moderately for at least 3 hours. Add water as necessary to maintain sample submersion. If the specimen is boiled, use a beaker or other suitable container which is adequately deep to prevent loss of the specimen caused by boiling over the sides of the container.

5.4 Place a tared, dried, filter on filter support plate, taking care to center position ring and tighten.

5.5 After allowing sufficient time for salt to dissolve, decant the solution (liquid) into the extractor. Add an appropriate amount of water to the sample and agitate it then decant into the extractor. Repeat this process until the water is clear.

5.6 The filter(s) must be dried, weighed, and the tare subtracted to determine the weight (mass) of the aggregate in the filter. This weight (mass) must be included in the extracted dry weight (mass) of the specimen.

**Note:** If a large amount of minus #200 material is in the sample, the filter may have to be changed.

**Method B - Simple Wash****6. APPARATUS**

6.1 *Funnel* and support to hold filter paper.

6.2 *Filter paper*, 5 to 40 micron.

6.3 *Oven or hot plate*.

6.4 *Drying pan*.

6.5 *Mixing spoon*.

- 6.6 *Balance or Scale* - Balance of sufficient capacity and sensitive to 0.1 grams or 0.02 percent of the principal sample weight, whichever is greater.

## 7. PROCEDURE

- 7.1 Split sample into a test portion of proper size. Either dry the entire sample to a constant weight (mass) in a 230°F ± 9° (110°C ± 5°) oven or on a hotplate; or split the sample into two test portions of proper size, using one portion for moisture correction. Dry the moisture correction portion to a constant weight (mass) in a 230°F ± 9° (110°C ± 5°) oven or on a hotplate. Determine the percent moisture.
- 7.2 Place test specimen in a tared drying pan and weigh to nearest 0.1g.
- 7.3 Pour an adequate quantity of water over the specimen so that all salt will dissolve and agitate thoroughly. Allow specimen to soak for a least 16 hours at 175°F ± 9° (80°C ± 5°). Stir the sample a minimum of three times during the soak. Alternatively to soaking for 16 hours at 175°F ± 9° (80°C ± 5°), place the specimen and water on stove or hot plate and heat the mixture so that the water boils moderately for at least 3 hours. Add water as necessary to maintain sample submersion. If the specimen is boiled, use a beaker or other suitable container which is adequately deep to prevent loss of the specimen caused by boiling over the sides of the container.
- 7.4 Place a tared, dried, filter on the funnel ring.
- 7.5 After allowing sufficient time for salt to dissolve, decant the solution (liquid) through the filter. Add an appropriate amount of water to the sample and agitate it then decant into the filter. Repeat this process until the water is clear.
- 7.6 The filter(s) must be dried, weighed, and the tare subtracted to determine the weight (mass) of the aggregate in the filter.

## 8. CALCULATIONS

- 8.1 Using the percent moisture determined from the moisture specimen, correct the original moist weight (mass) of the extraction portion, to a dry weight (mass) as follows:

$$\text{Dry Weight} = \frac{\text{Wet wt. of extraction specimen}}{100 + \% \text{ Moisture in Moisture Specimen}} \times 100$$

- 8.2 Where the contract specifies that the percent salt is based on the dry weight (mass) of the sand, calculate the percentage of salt as follows:

$$\% \text{ salt} = \frac{\text{Dry Weight} - \text{Ext. dry wt.}}{\text{Ext. dry wt.}} \times 100$$

Where "Ext. dry wt." is the dry weight (mass) of the specimen after extraction. Report to the nearest 0.1 percent.

- 8.3 If the contract specifies that percent salt is based on the dry weight (mass) of the salt sand mix, the equation for percent salt is:

$$\% \text{ salt} = \frac{\text{Dry Weight} - \text{Ext. dry wt.}}{\text{Dry Weight}} \times 100$$

Report to the nearest 0.1 percent.