

Standard Method of Test for Pigment Content in Water-Emulsion Paint Using Low Temperature Ashing

SCDOT Designation: SC-T-117 (8/2014)

1. SCOPE

To perform a chemical analysis of waterborne traffic paint to ensure proper structure of the paint to be suitable for SCDOT specifications (SC Standard 625).

2. REFERENCED DOCUMENTS

- 2.1. ASTM D 3723

3. APPARATUS

- 3.1. Aluminum foil dishes (150mL)
- 3.2. Drying oven
- 3.3. Paper clips
- 3.4. Water
- 3.5. Muffle furnace
- 3.6. Mechanical paint shaker
- 3.7. Syringe (6mL w/ minimum 0.5 gradient markers)

4. TEST SPECIMENS

- 4.1. One quart of paint

5. PROCEDURE

- 5.1. Using aluminum foil dishes, with paper clip as stirrer, precondition for 30 min in an oven at $105^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for waterborne paint.
- 5.2. Cool dishes to room temperature in a desiccator.
- 5.3. Heat and weigh dishes (to nearest 0.1 mg) to constant weight.
- 5.4. Mix sample on mechanical shaker for at least 5 min until homogenous.
- 5.5. Stir sample (by hand) to remove any air bubbles.
- 5.6. Using a 6 mL syringe, draw up 2.5 mL of sample. Wipe outside clean and then weigh syringe to 0.1 mg.

- 5.7. Add 4 mL of water to the aluminum dish. Dropwise add sample to the dish stirring with paper clip to mix; making sure that the sample covers the bottom of the dish evenly.
- 5.8. If a sample does not appear even, discard and repeat.
- 5.9. Prepare duplicate sample as in step 5.6 - 5.7.
- 5.10. Dry dishes containing samples in the oven at $105^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for at least 1 hour \pm 5 min.
- 5.11. Samples should be cooled in a desiccator and weighed to the nearest 0.1 mg.
- 5.12. Repeat heating and cooling should take place until constant weight is obtained (\pm 0.2 mg).
- 5.13. Transfer sample to muffle furnace at $450^{\circ}\text{C} \pm 25^{\circ}\text{C}$ for 1 hour \pm 5 min.
- 5.14. Remove dishes from furnace and place in a desiccator to cool.
- 5.15. Weigh samples and dishes.
- 5.16. Using Excel (or other suitable program) calculate percent of the non-volatile content (N), percent pigment content (P), percent vehicle (V), and non-volatile in vehicle (NVV).

6. CALCULATIONS

6.1. $N = ((A-B)/S) \times 100$

Where: A= weight of dish and specimen after heating, to constant weight, at 105°C
B= weight of dish alone
S= specimen weight

6.2. $P = ((C-B)/S) \times 100$

Where: C= weight of dish and specimen after ignition in furnace
B= weight of dish alone
S= specimen weight

6.3. $V = 100 - P$

6.4. $NVV = ((\text{Avg } N - \text{Avg } P) / V) \times 100$

Where: Avg N= average non-volatile content
Avg P= average pigment
V= vehicle

7. REFEREE

When conformance to chemical specification requirements is questioned, perform a referee analysis in accordance with ASTM D 3723.

8. REPORT

Prepare report on SCDOT Form TM 809 to record chemical analysis data.