

Test Procedure for

DETERMINING PERCENT OF SOLIDS IN ALKYL-SILICATE TYPE VEHICLES



TxDOT Designation: Tex-808-B

Effective Date: August 1999

1. SCOPE

- 1.1 Use this method to determine percentage of solids in alkyl-silicate type vehicles utilized in inorganic coatings.
 - 1.2 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.
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2. SAMPLING

- 2.1 Select at random a complete unit of material for each batch or lot of coating supplied to the project and submit the sample to CST/M&P for testing in accordance with Tex-801-B.
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3. APPARATUS

- 3.1 *Muffle furnace*, capable of maintaining 600°C (1,112°F).
 - 3.2 *Porcelain crucibles*, glazed inside and out except for the outside bottom, 100-mL (3.4-fl. oz.) capacity.
 - 3.3 *Oven*, capable of maintaining 115 ± 3°C (240 ± 6°F).
 - 3.4 *Super-centrifuge*.
 - 3.5 *Balance*, Class B in accordance with Tex-901-K, with minimum capacity of 100 g.
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4. MATERIALS

- 4.1 *Solution of ethanol and 0.1 N HCl*, 1:1.

5. PROCEDURES

5.1 *Clear Vehicle:*

- 5.1.1 Fire a crucible to a constant weight in a muffle furnace at 600°C (1,112°F).
- 5.1.2 Record the weight to the nearest 0.1 mg.
- 5.1.3 Thoroughly mix the vehicle and place the sample in a super-centrifuge.
- 5.1.4 Centrifuge to obtain clear vehicle.
- 5.1.5 Transfer the clear vehicle to a suitable sealable container.
- 5.1.6 Weigh 5–6 g of the clear vehicle into the previously weighed crucible and record the weight to the nearest 0.1 mg.
- 5.1.7 Add 5 mL (0.2 fl. oz.) of the ethanol-HCl solution, stir, and carry to dryness in the oven.
- 5.1.8 Repeat Section 5.1.7 three times.
- 5.1.9 Fire to a constant weight in a muffle furnace at 600°C (1,112°F).
- 5.1.10 Save the residue for an X-ray analysis of the clear vehicle.

5.2 *Total Vehicle:*

- 5.2.1 Fire a crucible to a constant weight in a muffle furnace at 600°C (1,112°F).
- 5.2.2 Record the weight to the nearest 0.1 mg.
- 5.2.3 Thoroughly mix the vehicle, weigh 5–6 g into the previously weighed crucible, and record the weight to the nearest 0.1 mg.
- 5.2.4 Add 5 mL (0.2 fl. oz.) of the ethanol-HCl solution, stir, and carry to dryness in the oven.
- 5.2.5 Repeat Section 5.2.4 three times.
- 5.2.6 Bring to a constant weight in a muffle furnace at 600°C (1,112°F) and record the weight to the nearest 0.1 mg.
- 5.2.7 Save the residue for X-ray analysis of the total vehicle.

6. CALCULATIONS

6.1 Calculate the percentage of solids in the clear vehicle:

$$\% \text{ Solids, Clear Liquids} = \frac{\text{Weight of Residue}}{\text{Weight of Sample}} \times 100$$

6.2 Calculate the percentage of solids in the total vehicle:

$$\% \text{ Solids, Total Vehicle} = \frac{\text{Weight of Residue}}{\text{Weight of Sample}} \times 100$$