



Standard Test Method for Filter-Retained Solids Content of Polymer Latexes¹

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1. Scope

1.1 This test method covers the determination of the filter-retained solids (grit) content of polymeric latex vehicles, that is, material present in a latex specimen that is retained on a 200-mesh screen.

1.2 The values stated in SI units are to be regarded as standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 11 Specification for Wire-Cloth Sieves for Testing Purposes²

E 145 Specification for Gravity-Convection and Forced-Ventilation Ovens²

3. Summary of Test Method

3.1 A specified weight of a polymer latex, first filtered through a 20-mesh screen to remove skins and large agglomerates, is water-washed through a preweighed 200-mesh stainless screen. The dried residue on the screen, defined as the filter-retained solids, is expressed as parts per million (ppm) of the polymer latex.

NOTE 1—Other screens or sample sizes, or both, may be used upon agreement between the producer and the user. Precision may vary with differing mesh size and sample weight.

4. Significance and Use

4.1 The amount of excessive oversized particulate matter present in polymer latexes can detract from the appearance properties of applied formulated coatings and may reduce filtration rates or clog filters in processing or application processes.

4.2 This test method may be useful as a quality control test

for latex manufacture and for product characterization.

5. Apparatus

5.1 *Analytical Balance*, capable of weighing to 0.1 mg.

5.2 *Balance*, capacity of 500 g, capable of weighing to 0.1 g.

5.3 *Dessicator*.

5.4 *Forced-Ventilation Oven*, Type II B conforming to Specification E 145.

5.5 *Forceps*.

5.6 *Spectra Mesh Filtration Unit*,³ (90-mm size).

5.7 *Graduated Cyclinder*, 500-mL.

5.8 *Polyethylene Water Wash Bottle*, 500-mL.

5.9 *Two Beakers*, 800-mL.

5.10 *Screen*, stainless steel, 90-mm diameter, 200-mesh (as defined in Specification E 11).

5.11 *Screen*, cloth or stainless steel, 20-mesh (as defined in Specification E 11).

6. Procedure

6.1 Weigh the clean, dry, 200-mesh screen to the nearest 0.1 mg. Record the weight, *A*.

6.2 Place the screen into the filtration apparatus.

NOTE 2—The screen should be held firmly in place while screwing down the filter chamber to ensure that the screen seats smoothly on the plastic ring.

6.3 Weigh 500 g of water into the 800-mL beaker and set aside.

6.4 Hand-stir the polymer latex sample for about 15 s using a wide blade spatula to ensure adequate mixing, taking care not to beat in air. Filter about 150 g of the latex sample through a standard 20-mesh cloth or stainless-steel sieve to remove skins or large pieces of coagulum.

6.5 Stir the filtered sample gently with the spatula. Immediately weigh out by difference about 50 g, weighed to 0.1 g, of the latex into an 800-mL beaker. Record the latex specimen weight, *B*.

¹ This test method is under the jurisdiction of ASTM Committee D-1 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.33 on Polymers and Resins.

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² *Annual Book of ASTM Standards*, Vol 14.02.

³ The sole source of supply of the spectra mesh filtration unit, catalog number 08-670-173 known to the committee at this time is Fisher Scientific Co., 711 Forbes Ave., Pittsburg, PA 15219-4785. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

6.6 Transfer the 500 g of water from 6.3 to the beaker with the specimen and stir the mixture with the spatula.

NOTE 3—If the latex coagulates on water dilution, the test is not applicable.

6.7 Slowly pour the mixture onto the 200-mesh screen, water-washing the sample from the beaker onto the screen with the polyethylene wash bottle.

6.8 Wash the residue on the screen with 1000 g of water, using the wash bottle to wash down the sides of the filtration apparatus and to move the solid toward the screen center.

6.9 *Specimen Drying:*

6.9.1 Carefully remove the screen from the apparatus using forceps, place the screen in the oven and dry for 1 h at $110 \pm 1^\circ\text{C}$.

6.9.2 Remove the screen from the oven using the forceps and allow the screen to cool for 10 min in a dessicator.

6.9.3 Weigh the screen plus dried solids to the nearest 0.1 mg. Record the weight, C .

6.10 Repeat 6.1-6.9.3 using a duplicate sample of the latex.

7. Calculation

7.1 Calculate the parts per million of filter retained solid content, S , in the analysis samples as follows:

$$S = \frac{(C - A) 10^6}{B} \quad (1)$$

where:

C = mass of screen and solid residue, g,

A = mass of screen, g, and

B = mass of latex sample, g.

7.2 Calculate the average filter-retained solids content from the duplicate analysis.

8. Report

8.1 Report the following information:

8.1.1 The filter-retained solids content to the nearest 10 ppm as the average of the two determinations and

8.1.2 The mesh size and sample weight used, if other than 200 mesh and 50 g.

9. Precision and Bias

9.1 The precision of this test method will be determined.

9.2 Since there is no accepted reference material for determining the bias of the procedure for measuring filter-retained solids no statement on bias is being made.

10. Keywords

10.1 filter-retained solids; grit; polymer latexes

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