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An American National Standard

Standard Test Method for Particle Size Analysis of Powdered Polymers and Copolymers of Vinyl Chloride¹

This standard is issued under the fixed designation D 1705; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method provides a wet-sieve technique applicable to the particle size analysis of powdered polymers and copolymers of vinyl chloride having particle sizes larger than 45 μm (No. 325 sieve).

1.2 The wet sieve technique assures elimination of static charges, which cause resin particle agglomeration. A wetting agent promotes complete displacement of air in porous resins. Adjustments in sample size are recommended to prevent malfunctioning of sieves with finer resins.

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

1.4 *This standard does not purport to address all of the safety problems, 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.*

NOTE 1—This standard is similar in content, but not technically equivalent to ISO 1624–1978.

2. Referenced Documents

2.1 ASTM Standards:

D 883 Terminology Relating to Plastics²

D 1600 Terminology for Abbreviated Terms Relating to Plastics²

E 11 Specification for Wire-Cloth Sieves for Testing Purposes³

2.2 ISO Standard:

ISO 1624–1978 Plastics—Vinyl Chloride Homopolymer and Copolymer Resin—Sieve Analysis in Water⁴

3. Terminology

3.1 *General*—Definitions are in accordance with Terminology D 883 and abbreviations with Terminology D 1600, unless otherwise indicated.

4. Significance and Use

4.1 This test method can be used to determine particle size distribution and therefore is useful for determining lot-to-lot uniformity of vinyl chloride resins.

5. Apparatus

5.1 *Balance or Scale*, with a minimum capacity of 500 g, sensitive to 0.1 g.

5.2 *Balance*, with a minimum capacity of 100 g, sensitive to 0.01 g (optional).

5.3 *Sieves*, conforming to the requirements of Specification E 11.

5.4 *Oven*, circulating-air type, controlled to $70 \pm 2^\circ\text{C}$.

6. Reagent

6.1 *Sodium Alkyl Aryl Sulfonate or Sodium Lauryl Sulfate Type Wetting Agent*⁵—Other wetting agents may be satisfactory, provided that they give good dispersion and do not swell the resin particles.

6.2 Make a 0.5 % solution of wetting agent in water.

7. Procedure

7.1 Weigh the sieves to the nearest 0.1 g.

7.2 Assemble the sieves in order of increasing number from top to bottom. Choice of sieves (or sieve) will depend upon the material to be tested.

7.3 Weigh into a beaker a sample of not less than 25 g nor more than 100 g weighed to the nearest 0.1 g (Note 2). Use a sample of maximum size but such that not more than 20 g of sample remain on any one sieve.

NOTE 2—When sieves of other than 200 mm nominal diameter are used, the sample size should be adjusted in proportion to the sieve area.

7.4 Add approximately 300 mL of the solution to the sample while stirring. Stir until the resin is thoroughly wetted.

7.5 Pour this mixture on the top sieve. Complete the transfer of resin with more wetting agent solution. Then wash all but the larger particles through with a gentle stream of water.

7.6 In case more than one sieve is used, remove the top sieve and continue washing each successive sieve. If particles on the lower sieves are not thoroughly wet, add additional wetting agent solution to the sieve and follow by further washing.

7.7 After washing, transfer the sieves to an oven overnight, or until dry (Note 3). The temperature should not exceed 70°C . Forced air systems should be sufficiently gentle to prevent polymer loss by blowing.

¹ This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials (Section D20.15.07).

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² Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁵ Satisfactory wetting agents include Duponol sodium lauryl sulfate C or ME (E. I. du Pont de Nemours and Co., Inc.) and Santomerse No. 3 (Monsanto Co.) or Ultrawet DS (Atlantic Richfield Co.), which are sodium alkyl aryl sulfonate.