



Standard Test Method for Apparent Viscosity of Plastisols and Organosols at Low Shear Rates¹

This standard is issued under the fixed designation D 1824; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This test method covers the measurement of plastisol and organosol viscosity at low shear rates.

1.2 Apparent viscosity at high shear rates is covered in Test Method D 1823.

1.3 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.4 *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.*

NOTE 1—This test method resembles ISO 3219-1977 in title only. The content is significantly different.

2. Referenced Documents

2.1 ASTM Standards:

D 1755 Specification for Poly(Vinyl Chloride) Resins²

D 1823 Test Method for Apparent Viscosity of Plastisols and Organosols at High Shear Rates by Extrusion Viscometer²

E 1 Specification for ASTM Thermometers³

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁴

2.2 ISO Standard:

ISO 3219-1977: Polymers in the Liquid, Emulsified, or Dispersed State—Determination of Viscosity With a Rotational Viscometer Working at a Defined Shear Rate⁵

3. Summary of Test Method

3.1 The sample is conditioned to the proper temperature and its viscosity is determined.

4. Significance and Use

4.1 The suitability of a dispersion resin for any given application process is dependent upon its viscosity characteristics.

4.2 The viscosity defines the flow behavior of a plastisol or organosol under low shear. This viscosity relates to the conditions encountered in pouring, casting, molding, and dipping processes.

5. Apparatus

5.1 *Viscometer*.⁶

5.2 *Sample Containers, Tin Cans, or Glass Jars*, 1-pt (500-mL) capacity. Minimum dimensions of containers should be 80-mm (3.15-in.) inside diameter by 80 mm (3.15 in.) deep.

5.3 *Thermometer*, ASTM Solvents Distillation Thermometer having a range from -2 to $+52^{\circ}\text{C}$ (28 to 126°F) and conforming to the requirements for Thermometer 37C as prescribed in Specification E 1.

5.4 *Timer*.

6. Conditioning

6.1 Maintain the plastisol or organosol samples at $23 \pm 1^{\circ}\text{C}$ ($73 \pm 2^{\circ}\text{F}$) and $50 \pm 5\%$ relative humidity at all times after mixing and throughout the period of viscosity determinations.

7. Procedure

7.1 Select a spindle that will read in the middle or upper portion of the viscometer dial at the highest rotational speed to be used. Insert the spindle into the sample at approximately a 45° angle. Withdraw the spindle and attach it to the viscometer. Taking care not to entrap an air bubble, lower the viscometer to immerse the spindle near the edge of the sample. Move the sample so as to center the spindle. Adjust its depth to the immersion mark.

7.2 Start the viscometer at its lowest speed. Allow it to run 2 min. Record the scale reading during the next rotation.

⁶ Brookfield model RVF or LVF, or equivalent has been found satisfactory for this purpose. Brookfield Engng. Labs, Inc., Stoughton, MA 02072.

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 D20.15.08).

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This edition contains changes in Sections 1, 2, and 11 to include an ISO equivalency statement, to reference a high shear rate test method, and to include Keywords.

² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 14.03.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

⁵ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.