This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D3591 – 17

Standard Test Method for Determining Logarithmic Viscosity Number of Poly(Vinyl Chloride) (PVC) in Formulated Compounds[1]

This standard is issued under the fixed designation D3591; 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 covers the determination of the logarithmic viscosity number of poly(vinyl chloride) (PVC) homopolymers after compounding or processing.

1.2 It is the basic assumption of this technique that the formulation of the compounded resin is known and that any additives present can be separated from the resin by extraction with diethyl ether. This is necessary to permit adjustment of the amount of sample used in the test to give a resin concentration in cyclohexanone of 0.2 ± 0.002 g/100 mL.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in 7.3 and 8.4.1.

NOTE 1—This test method and ISO 1628-2 are not equivalent.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)

D446 Specifications and Operating Instructions for Glass Capillary Kinematic Viscometers

D1243 Test Method for Dilute Solution Viscosity of Vinyl Chloride Polymers

D2124 Test Method for Analysis of Components in Poly(Vinyl Chloride) Compounds Using an Infrared Spectrophotometric Technique

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E2251 Specification for Liquid-in-Glass ASTM Thermometers with Low-Hazard Precision Liquids

E2935 Practice for Conducting Equivalence Testing in Laboratory Applications

IEEE/ASTM SI-10 Standard for the Use of International System of Units (SI)

2.2 *ISO Standard:*

1628-2 Plastics—Determination of Viscosity Number and Limiting Viscosity Number—Part 2: Poly (Vinyl Chloride) Resins[3]

3. Terminology

3.1 Units and symbols used in this test method are those recommended in IEEE/ASTM SI-10.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 The term *logarithmic viscosity number* is defined by the equation is 9.1.

4. Summary of Test Method

4.1 The sample is pressed into a thin film and extracted to remove the plasticizer.

4.2 The plasticizer-free film is dissolved in cyclohexanone and centrifuged to remove insoluble matter.

4.3 The viscosity of the cyclohexanone solution is measured in accordance with Test Method D1243.

5. Significance and Use

5.1 The logarithmic viscosity number provides information on the effect of compounding or processing of PVC.

5.2 Exposure of PVC compositions to shear or to high temperatures can result in a change in the logarithmic viscosity number of the resin.

[1] This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.70 on Analytical Methods.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

*A Summary of Changes section appears at the end of this standard

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