



Designation: D1243 – 22^ε¹

Standard Test Method for Dilute Solution Viscosity of Vinyl Chloride Polymers¹

This standard is issued under the fixed designation D1243; 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.

^ε¹ NOTE—Editorially corrected equation in 9.1 in October 2023.

1. Scope*

1.1 This test method covers the determination of the dilute solution viscosity of vinyl chloride polymers in cyclohexanone. The viscosity is expressed in terms of inherent viscosity (logarithmic viscosity number). The test method is limited to those materials that give clear, uniform solutions at the test dilution.

NOTE 1—Other expressions for viscosity may be used as described in the Appendix, but any change from the test method as specified shall be stated in the report.

1.2 The values stated in SI units are to be regarded as the 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 2—This standard and ISO 1628-2 address the same subject matter, but differ in technical content.

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

D883 Terminology Relating to Plastics

D1600 Terminology for Abbreviated Terms Relating to Plastics

D1755 Specification for Poly(Vinyl Chloride) Resins

D2857 Practice for Dilute Solution Viscosity of Polymers

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

2.2 *ISO Standard:*

ISO 1628-2 Determination of Viscosity Number and Limiting Viscosity Number—Part 2: Poly(Vinyl Chloride) Resins³

2.3 *National Institute of Standards and Technology Circular:*⁴

C-434 Testing of Glass Volumetric Apparatus

3. Terminology

3.1 *Definitions*—For definitions of terms pertaining to plastics used in this test method, refer to Terminology **D883**. For abbreviations used in this test method, refer to Terminology **D1600**, unless otherwise indicated.

4. Summary of Test Method

4.1 A sample of resin is dissolved in cyclohexanone to make a solution of specified concentration. Inherent viscosity (logarithmic viscosity number) is calculated from the measured flow times of the solvent and of the polymer solution.

NOTE 3—For additional information, refer to Test Method **D445** and Test Method **D2857** for Dilute Solution Viscosity of Polymers.

5. Significance and Use

5.1 Dilute solution viscosity values for vinyl chloride polymers are related to the average molecular size of that portion of the polymer that dissolves in the solvent.

¹ This test method is under the jurisdiction of ASTM Committee **D20** on Plastics and is the direct responsibility of Subcommittee **D20.15** on Thermoplastic Materials.

Current edition approved May 1, 2022. Published May 2022. Originally approved in 1952. Last previous edition approved in 2015 as D1243 - 15. DOI: 10.1520/D1243-22E01.

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>.

⁴ Available from National Institute of Standards and Technology (NIST), 100 Bureau Dr., Stop 1070, Gaithersburg, MD 20899-1070, <http://www.nist.gov>.

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