



Standard Practice for Oven Heat Stability of Poly(Vinyl Chloride) Compositions¹

This standard is issued under the fixed designation D 2115; 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 practice lists procedures for determining the relative thermal stability of sheet or molded poly(vinyl chloride) compounds as indicated by discoloration due to exposure to an elevated temperature at controlled oven conditions.

1.2 A specimen preparation technique using a two-roll mill is provided for compositions that are not in molded or sheeted form.

1.3 This practice is not intended for use in purchasing specifications because the conditions of processing plastic compounds vary widely, and the degree of correlation of data obtained by this practice to process exposure has not been determined. However, despite this limitation, this practice does yield data of value in judging the comparative service quality of poly(vinyl chloride) compositions.

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

1.5 *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 standard is similar in content, but not technically equivalent to ISO 305–1990.

2. Referenced Documents

2.1 ASTM Standards:²

D 883 Terminology Relating to Plastics

D 1600 Terminology for Abbreviated Terms Relating to Plastics

2.2 ISO Standard:

ISO 305–1990 Plastics—Determination of Thermal Stability of Poly(Vinyl Chloride), Related Chlorine-Containing

Polymers and Copolymers and Their Compounds—
Discoloration Method³

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 Poly(vinyl chloride) compositions degrade by discoloration on prolonged exposure to heat. The degree of discoloration is related to the condition of exposure, such as length of period and temperature. When the conditions of exposure are fixed and controlled, then the relative resistance to discoloration due to heat of two or more compositions may be determined. The precision of heat stability testing is also dependent on the thickness of the specimens and the history of heat exposure prior to testing. This practice allows for control or the reporting of these variables.

4.2 This practice is particularly applicable for determining gross differences in the heat stabilities of poly(vinyl chloride) compositions that are detectable as a color change. It is not intended to measure absolute thermal stability. Although the observed color changes may be evidence of degradation, molecular degradation phenomena such as chain-scission or cross-linking may not be identifiable.

NOTE 2—While discoloration caused by exposure to elevated temperature is commonly regarded as evidence of degradation in poly(vinyl chloride) compositions, it must be borne in mind that some vinyl compositions may undergo substantial change in color without appreciable loss of mechanical strength, chemical resistance, etc., whereas others may resist change in color yet undergo substantial change in other properties. Therefore, resistance to discoloration should not be taken as sole evidence of thermal stability. It is recommended that this test be supplemented by others such as tensile strength and elongation, impact strength, and deflection temperature under load (for rigid compositions), Durometer hardness (for nonrigid compositions), and dilute solution viscosity, and that the test results before and after oven exposure be compared to determine the degree of degradation which has been produced in each of the properties measured.

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

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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.

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