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: D5594 – 18a

Standard Test Method for Determination of the Vinyl Acetate Content of Ethylene-Vinyl Acetate (EVA) Copolymers by Fourier Transform Infrared Spectroscopy (FT-IR)[1]

This standard is issued under the fixed designation D5594; 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 infrared procedures for determining the vinyl acetate content of EVA copolymers using pressed films (Procedure A) or molded plaques (Procedure B) and internal corrections for sample thickness.

1.2 This test method is applicable to the analysis of EVA copolymers containing 0.5 to 55 % vinyl acetate except as specified in 1.3.

1.3 Talc interferes with the 1020 cm^{-1} vinyl acetate band. Resins containing <5 % vinyl acetate and talc are excluded from the scope of this test method.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are provided for information purposes 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.* Specific precautionary statements are given in Section 8.

NOTE 1—There is no known ISO equivalent to this standard.

1.6 *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]

E131 Terminology Relating to Molecular Spectroscopy

E168 Practices for General Techniques of Infrared Quantitative Analysis

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

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

IEEE/ASTM SI-10 Use of the International System of Units (SI): The Modem Metric System

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

2.2 *ISO Standard:*

ISO 8985 Plastics—Ethylene/Vinyl Acetate Copolymer Thermoplastics—Determination of Vinyl Acetate[3]

3. Terminology

3.1 *Definitions:*

3.1.1 Units, symbols, and abbreviations used in this test method appear in Terminology E131 or IEEE/ASTM SI-10.

3.2 *Abbreviations:*

3.2.1 *EVA*—ethylene-vinyl acetate copolymer.

3.2.2 *PTFE*—tetrafluorethylene polymer.

3.2.3 *FT-IR*—Fourier transform infrared.

4. Summary of Test Method

4.1 The vinyl acetate content is measured using infrared absorption band at 1020 cm^{-1} (0.5 to 5 % vinyl acetate) or 609 cm^{-1} (5 to 55 % vinyl acetate).

4.2 Sample thickness is measured internally using an ethylene infrared absorption band at 720 cm^{-1} (28 to 55 % vinyl acetate), 2020 cm^{-1} (0.5 to 28 % vinyl acetate), or 4250 cm^{-1} (5 to 28 % vinyl acetate).

4.3 Regression analysis is performed on vinyl acetate/ethylene ratios versus known vinyl acetate contents for EVA copolymer standards. The resulting equation is used to calculate the vinyl acetate content for subsequent EVA copolymer samples.

[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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