Designation: D2839 – 16

Standard Practice for Use of a Melt Index Strand for Determining Density of Polyethylene[1]

This standard is issued under the fixed designation D2839; 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 covers the preparation of a sample for polyethylene density determination in accordance with Test Method D1505. The sample consists of a strand produced by extrusion of the polyethylene in accordance with Test Method D1238, Condition 190/2.16 (Melt Index).

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

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 and health practices and determine the applicability of regulatory limitations prior to use.*

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

NOTE 2—The precision data on densities measured using this sample preparation practice is listed in Test Method D1505.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1238 Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

D1505 Test Method for Density of Plastics by the Density-Gradient Technique

D4703 Practice for Compression Molding Thermoplastic Materials into Test Specimens, Plaques, or Sheets

3. Terminology

3.1 *Definitions:*

3.1.1 *melt index strand*—the extrudate produced when polyethylene is extruded in accordance with Test Method D1238, Condition 190/2.16.

4. Significance and Use

4.1 This practice has been found to be very useful for preparing polyethylene samples suitable for determination of density by Test Method D1505, for quality control purposes, especially in a resin manufacturing facility where fast, reproducible, comparative results are needed. It is not necessarily recommended for resin specifications that are part of a sales contract between the buyer and the seller.

4.2 The density of a polyethylene sample is highly dependent on the preparation and thermal history of the specimens. The level of density results obtained by this practice of sample preparation differs from that obtained by other methods as described in Practice D4703, Annex A1.

4.3 Before proceeding with this practice, reference shall be made to the specification of the material being tested. Any test specimen preparation, conditioning, dimensions, or testing parameters, or some combination thereof, covered in the materials specification shall take precedence over those mentioned in this practice. If there are no material specifications, the default conditions apply.

5. Apparatus

5.1 *Extrusion Plastometer,* as described in Test Method D1238.

5.2 *Hot Plate,* to boil water.

5.3 *Beakers,* 250-mL low form, graduated, with watch-glass covers.

6. Sample

6.1 *Polyethylene,* in any form suitable for test in accordance with Test Method D1238.

7. Procedure

7.1 Prepare a Melt Index Strand by extruding the sample in accordance with Test Method D1238, Condition 190/2.16, dropping the strand on a cool metal plate after cutting off. When Procedure B of Test Method D1238 is used, cut off the extrudate at about the time the timer is actuated and discard. Save the portion extruded during the timed interval.

NOTE 3—It has been shown that the measured density of an extruded

[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 (D20.15.01).

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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.

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