



Standard Test Method for Use of a Melt Index Strand for Determining Density of Polyethylene¹

This standard is issued under the fixed designation D 2839; 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 preparation of a sample for polyethylene density determination in accordance with Test Method D 1505. The sample consists of a strand produced by extrusion of the polyethylene in accordance with Test Method D 1238, 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 similar or equivalent ISO standard.

2. Referenced Documents

2.1 ASTM Standards:

D 1238 Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer²

D 1505 Test Method for Density of Plastics by the Density-Gradient Technique²

D 1928 Practice for Preparation of Compression-Molded Polyethylene Test Sheets and Test Specimens²

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method³

3. Terminology

3.1 Definitions:

3.1.1 *melt index strand*—the extrudate produced when polyethylene is extruded in accordance with Test Method D 1238, Condition 190/2.16.

4. Significance and Use

4.1 This test method has been found to be very useful for preparing polyethylene samples suitable for determination of

density by Test Method D 1505, 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 which may be a 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 test method of sample preparation differs from that obtained by other methods as described in Practice D 1928.

4.3 Before proceeding with this test method, reference should 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 test method. If there are no material specifications, the default conditions apply.

5. Apparatus

5.1 *Extrusion Plastometer*, as described in Test Method D 1238.

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 D 1238.

7. Procedure

7.1 Prepare a Melt Index Strand by extruding the sample in accordance with Test Method D 1238, Condition 190/2.16, dropping the strand on a cool metal plate after cutting off. When Procedure B of Test Method D 1238 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 2—The conditioning procedure as described in 7.2 and 7.3 may be omitted, if desired; in such case, after a 10-min cooling period, cut off the density specimen as described in 7.4 and determine the density in accordance with Test Method D 1505.

7.2 Drop the strand into a 250-mL beaker containing at least 200 mL of briskly boiling water, and cover with a watch-glass. Keep a large beaker full of water boiling along with this so that the amount of water can be maintained at 200 mL for the whole

¹ This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.12 on Olefin Plastics.

Current edition approved July 10, 1996. Published September 1996. Originally published as D 2839 – 69. Last previous edition D 2839 – 93.

This revision includes the addition of an ISO equivalency statement and precision and bias data.

² *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 14.02.