



Designation: D8195 – 18

Standard Classification System and Basis for Specification for Polyethylene Terephthalate Film and Sheeting¹

This standard is issued under the fixed designation D8195; 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 standard provides a classification system for tabulating the properties for biaxially oriented polyethylene terephthalate film and sheeting in thicknesses from 1.5 μm to 355 μm . For this classification system, polyethylene terephthalate film and sheeting shall be defined as the material derived from terephthalic acid and ethylene glycol and shall consist of at least 90 % polyethylene terephthalate homopolymer with a typical melting temperature range of 225 $^{\circ}\text{C}$ to 250 $^{\circ}\text{C}$. This specification does not apply to coated, coextruded, tinted, pigmented, or metallized film or sheeting. This classification (in accordance with [D8065/D8065M](#)) is intended to eventually replace Specification [D5047](#) (ref. [Note 3](#)).

NOTE 1—Film is defined in Terminology [D883](#) as an optional term for sheeting having a nominal thickness no greater than 250 μm .

NOTE 2—In order to conform to the original scope of Specification [D5047](#), this classification also includes sheeting up to and including thicknesses of 355 μm .

NOTE 3—It is strongly recommended that this classification system be used for all new applications and specifications and that the specification of films referencing Specification [D5047](#) be expeditiously withdrawn or converted to this classification system.

1.2 Polyethylene terephthalate materials, being thermoplastic, are reprocessible and recyclable. This specification allows for the use of those polyethylene terephthalate plastic materials, provided that any specific requirements as governed by the producer and end user are met.

1.3 In all cases where the provisions of this classification system would conflict with a currently referenced ASTM specification for a particular film product, the latter shall take precedence (see [Note 3](#)).

1.4 This classification system applies to commercial products and, as such, there is no control over the manufacturing parameters employed in producing the film. It shall be the responsibility of those developing the specification documents utilizing this classification system to identify the critical parameters and values to be used for the cell classifications and suffix requirements.

¹ This test method is under the jurisdiction of ASTM Committee [D20](#) on Plastics and is the direct responsibility of Subcommittee [D20.19](#) on Film, Sheeting, and Molded Products.

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1.5 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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 4—There is no known ISO equivalent to this standard.

1.7 *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

- [D150 Test Methods for AC Loss Characteristics and Permittivity \(Dielectric Constant\) of Solid Electrical Insulation](#)
- [D882 Test Method for Tensile Properties of Thin Plastic Sheeting](#)
- [D883 Terminology Relating to Plastics](#)
- [D1003 Test Method for Haze and Luminous Transmittance of Transparent Plastics](#)
- [D1894 Test Method for Static and Kinetic Coefficients of Friction of Plastic Film and Sheeting](#)
- [D1922 Test Method for Propagation Tear Resistance of Plastic Film and Thin Sheeting by Pendulum Method](#)
- [D3892 Practice for Packaging/Packing of Plastics](#)
- [D5047 Specification for Polyethylene Terephthalate Film and Sheeting](#)
- [D7209 Guide for Waste Reduction, Resource Recovery, and Use of Recycled Polymeric Materials and Products \(Withdrawn 2015\)](#)³
- [D8065/D8065M Classification System and Basis for Specification for Specifying Plastic Films](#)

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 The last approved version of this historical standard is referenced on www.astm.org.

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

3. Terminology

3.1 Definitions—The definitions used in this classification system are in accordance with Terminology D883.

4. Significance and Use

4.1 The purpose of this classification system is to provide a method of adequately identifying polyethylene terephthalate films and sheeting and to provide a means for specifying these films and sheeting by the use of a simple line call-out designation.

5. Classification

5.1 The classification of Polyethylene terephthalate films and sheeting shall be as follows (ref. D8065/D8065M).

- 5.1.1 Generic—PETF
- 5.1.2 Group—0 (not applicable)
- 5.1.3 Type—0 (not applicable)
- 5.1.4 Fabrication Process—4 (stretch film – biaxial)
- 5.1.5 Nominal Gauge (see Table 1)

NOTE 5—Example (1), a Polyethylene Terephthalate bi-axially oriented, nominal gauge of 60 μm –PETF0043.

5.2 Cell Table A (Table 2) shall be used to specify the property requirements that shall be shown by a five-digit designation. The designation shall consist of the letter A and the five digits comprising the cell numbers for the property requirements in the order they appear in Cell Table A (Table 2).

5.2.1 Although the values listed are necessary to include the range of properties available in the existing materials, not every possible combination of the properties exist or can be obtained.

NOTE 6—Example (2), PETF0043A42422, a Polyethylene Terephthalate bi-axially oriented, nominal gauge of 60 μm, Tensile Stress at Break (MD) >200 - ≤250, Tensile Stress at Break (TD) 100 - <135, Tensile Modulus >4500 - ≤5500, CoF >0.2 - ≤0.25, Haze >5 - ≤20.

6. Suffix Requirements

6.1 When specific requirements are needed to supplement the general classifications not covered in Table A (Table 2), they shall be specified through the use of suffixes. In general, the first suffix letter indicates the special requirement needed and sufficient digits are used to indicate the specific requirements.

NOTE 7—When using the suffixes for specific requirements, the user must keep in mind that not all tests are routinely conducted by the supplier. When these requirements are necessary to identify particular characteristics important to specific applications they shall be specified.

6.1.1 In order to avoid lengthy and cumbersome call-outs, it is recommended that the specific requirements be limited in number to five (5) and represent only the more critical

properties. Additional test methods that can be used to provide further characterization of films are to be found in Appendix X1.

6.2 Although the values listed in cell tables include the range of properties available in existing materials, which does not imply that every possible combination of properties exists or can be obtained.

Y—Tensile Yield Stress—MD (MPa) (D882)—min.
0 = To be specified by user.

- 1 = 90
- 2 = 100
- 3 = 110
- 4 = 120

T—Elmendorf Tear Strength (g-f) MD (D1922)—min.
0 = To be specified by user.

- 1 = 20
- 2 = 45
- 3 = 50
- 4 = 75

C—Dielectric Constant (D150) @ 25 °C—min.
0 = To be specified by user.

- 1 = 3.3 @ 60 Hz
- 2 = 3.25 @ 1 kHz
- 3 = 3.0 @ 1 MHz
- 4 = 2.8 @ 1 GHz

F—Dissipation Factor (D150) @ 25 °C—min.
0 = To be specified by user.

- 1 = 0.0025 @ 60 Hz
- 2 = 0.0050 @ 1 kHz
- 3 = 0.016 @ 1 MHz
- 4 = 0.0008 @ 1 GHz

NOTE 8—Example (3), PETF0043A42422Y2T3F3, a Polyethylene Terephthalate bi-axially oriented, nominal gauge of 60 μm, Tensile Stress at Break (MD) >200 - ≤250, Tensile Stress at Break (TD) 100 - <135, Tensile Modulus >4500 - ≤5500, CoF >0.2 - ≤0.25, Haze >5 - ≤20, Tensile Yield Stress 100 (min.), Tear Strength 50 (min.), Dissipation Factor 0.016 @ 1 MHz (min.).

7. General Requirements

7.1 The composition of the specified films shall be uniform and shall conform to the requirements specified herein.

8. Detail Requirements

8.1 The film shall conform to the requirements prescribed in the appropriate table (generic classification and suffix) as they apply.

8.2 For the purpose of determining conformance with this classification system, all specified limits used in the specific standards, are absolute limits as defined in Practice E29.

8.3 With the absolute method, an observed value or a calculated value is not rounded, but is to be compared directly with the specified limiting value. Conformance or nonconformance with the specification is based on this comparison.

9. Sampling

9.1 Sampling shall be statistically adequate to satisfy the requirements of 13.4. A lot of film shall be considered as a unit

TABLE 1 PETF Nominal Gauge Classifications

Designation	1	2	3	4	5	6	0
Nominal Gauge (μm)	≤10	>10 - ≤50	>50 - ≤75	>75 - ≤125	>125 - ≤250	>250 - 355	Not Specified