



**Designation: ~~D3595-97~~ Designation: D 3595 - 02 (Reapproved 2007)**

## Standard Specification for Polychlorotrifluoroethylene (PCTFE) Extruded Plastic Sheet and Film<sup>1</sup>

This standard is issued under the fixed designation D 3595; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope <sup>\*</sup>

~~1.1 This specification covers extruded sheet and film in thicknesses from 0.015 to 0.25 mm (0.0006 to 0.01 in.).~~

1.1 This specification covers extruded sheet and film in thicknesses from 0.015 to 0.25 mm (0.0006 to 0.01 in.).

1.2 The values stated in SI units shall be regarded as the standard.

1.3 The following precautionary statement pertains only to the test methods portion, Section 9 of this specification: *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 ISO equivalent specification to this specification.<sup>2</sup>

### 2. Referenced Documents

2.1 *ASTM Standards*:<sup>3</sup>

D 374 Test Methods for Thickness of Solid Electrical Insulation

~~D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing~~ Practice for Conditioning Plastics for Testing

D 882 Test Methods ~~Method~~ for Tensile Properties of Thin Plastic Sheeting

D 883 Terminology Relating to Plastics

D 1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

~~D 1430 Specification for Polychlorotrifluoroethylene (PCTFE) Plastics~~<sup>3</sup> Classification System for Polychlorotrifluoroethylene (PCTFE) Plastics

~~D 1600 Terminology for Abbreviated Terms Relating to Plastics~~<sup>3</sup>

~~D 1898 Practice for Sampling of Plastics~~<sup>3</sup> Terminology for Abbreviated Terms Relating to Plastics

D 3892 Practice for Packaging/Packing of Plastics

~~F 1249 Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor~~<sup>3</sup>

Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor

IEEE/ASTM SI 10 Standard for Use of the International System of Units (SI): The Modern Metric System<sup>4</sup>

### 3. Terminology

3.1 Definitions of terms used in this specification shall be in accordance with Terminology D 883.

~~3.2 Abbreviations are in accordance with Terminology D 1600~~

3.2 *lot, n*—one production run or a uniform blend of two or more production runs.

3.3 Abbreviations are in accordance with Terminology D 1600. PCTFE is the abbreviation for polychlorotrifluoroethylene.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials (Section D20.15.12).

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<sup>1</sup> This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials

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<sup>2</sup> Annual Book of ASTM Standards, Vol 10.01.

<sup>2</sup> As defined in IEEE/ASTM SI 10.

<sup>3</sup> Annual Book of ASTM Standards, Vol 08.01.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> Annual Book of ASTM Standards, Vol 08.02.

<sup>4</sup> Available from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

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

#### 4. Classification

4.1 This specification covers ~~three~~<sup>four</sup> types of polychlorotrifluoroethylene sheet and film:<sup>5</sup>

4.1.1 *Type I*—Transparent film, with high and low moisture vapor transmission rate.

4.1.2 *Type II*—Dimensionally stable transparent sheet and film with low moisture vapor transmission rate.

4.1.3 *Type III*—Dimensionally stable transparent film with very low moisture vapor transmission rate.

4.1.4 *Type IV*—Low crystalline transparent film with high ductility and extremely low moisture vapor transmission.

4.2 A one-line system may be used to specify materials covered by this specification. The system uses predefined cells to refer to specific aspects of this specification, as illustrated below.

Specification								
Standard Number	:	Type	:	Grade	:	Class	:	Special Notes
Block	:		:		:		:	
.....	:	---	:	---	:	---	:	----
Example: Specification D 4895 — 89,	:	I	:	6	:	E	:	
Example: Specification D 3595 — 02,	:	I	:	6	:	C	:	

For this example, the line callout would be Specification ~~D 4895 — 89, I 6 C, D 3595 — 02, I 6 C~~, and would specify a coagulated dispersion form of polytetrafluoro-ethylene that has all of the properties listed for that Type, Grade, and Class in the appropriate specified properties, tables, or both, in the specification identified. A comma is used as the separator between the Standard Number and the Type. Separators are not needed between the Type, Grade, and Class.<sup>6</sup> Provision for Special Notes is included so that other information can be provided when required. An example would be in Specification D 3295 – 81a where dimensions and tolerances are specified for each AWG size within Type and Class. When Special Notes are used, they should be preceded by a comma.

#### 5. Requirements

5.1 The sheet and film shall be manufactured from polychlorotrifluoroethylene (PCTFE) plastics that consist of at least 90 % chlorotrifluoroethylene. The remaining 10 % may include chemical modifications, such as co-monomers, but not colorants, fillers, plasticizers, or mechanical blends of other resins.

5.2 The length, width, roll core diameter, and maximum number of splices permitted shall be as agreed upon between the purchaser and the seller. The tolerance for roll width shall be 3 % mm (1/8 in.). The tolerance for roll length shall be ± 10 % of the specified length.

5.3 Thickness tolerances shall be as specified in Table 1.

5.4 The sheet and film shall conform to the property values specified in Table 2, Table 3, and Table 4.

5.5 The material shall be essentially free from contamination, wrinkles, holes, scratches, and other imperfections unless otherwise agreed upon between the purchaser and the seller.

#### 6. Sampling

~~6.1 Unless otherwise agreed between the purchaser and the seller the materials shall be sampled in accordance with the sampling procedure prescribed in Practice D1898~~

~~6.1 Sampling shall be statistically adequate to satisfy the requirements of 10.4.~~

~~6.1.1 Adequate statistical sampling shall be considered an acceptable alternative.~~

~~6.2 A lot shall consist of all material of the same thickness delivered at the same time.~~

#### 7. Number of Tests

7.1 One set of test specimens as prescribed in Section 8 shall be considered sufficient for testing each batch. The average result of the specimens tested shall conform to the requirements of this specification.

<sup>5</sup> The basic polymer used to make these types of polymer does not correspond to the types given in Specification D 1430.

<sup>6</sup> See the ASTM *Form and Style Manual*. Available from ASTM Headquarters.

**TABLE 1 Thickness Tolerance**

Thickness		Tolerance, %	Type Availability
mm	in.		
0.015	0.0006	±20	IV
0.019	0.00075	±20	III
0.023	0.0009	±20	IV
0.038	0.0015	±20	I,
0.051	0.0002	±15	I, II, III, IV
0.076	0.0003	±15	II
0.127	0.0005	±15	II
0.19	0.0075	±10	II
0.20	0.0078	±10	III
0.25	0.010	±10	II