Designation: D 3369 – 01

Standard Specification for Polytetrafluoroethylene (PTFE) Resin Cast Film[1]

This standard is issued under the fixed designation D 3369; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope *

1.1 This specification covers PTFE-fluorocarbon resin cast film in thicknesses from 0.025 to 0.127 mm (0.001 to 0.005 in.).

1.2 PTFE film and sheet are made by several different processes and the properties of the products reflect both the different starting polymers and the different processes. Properties that are affected include, but are not limited to: tensile strength and elongation at break, porosity, anisotropy, and molecular weight. A related standard is Specification D 3308. It is important to examine each of the other standards to select the one appropriate for the application.

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

NOTE 1—There is no similar or equivalent ISO standard.

1.4 The following precautionary caveat pertains only to the test methods portion, Section 7, 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.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 149 Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Electrical Insulating Materials at Commercial Power Frequencies[2]

D 374 Test Methods for Thickness of Solid Electrical Insulation[2]

D 618 Practice for Conditioning Plastics for Testing[3]

D 792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement[3]

D 883 Terminology Relating to Plastics[3]

D 1389 Test Method for Proof-Voltage Testing of Thin Solid Electrical Insulating Materials[2]

D 3308 Specification for PTFE Resin Skived Tape[4]

D 3892 Practice for Packaging/Packing of Plastics[4]

D 4895 Specification for Polytetrafluoroethylene (PTFE) Resins Produced from Dispersion[5]

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology D 883.

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

4. Classification

4.1 This specification covers one type of TFE-fluorocarbon resin cast film.

5. Physical Requirements

5.1 The film shall conform to the property values specified in Table 1.

5.2 The length and width of the film shall be as agreed upon between the purchaser and the manufacturer. The tolerance in length and width shall be + 6.35 mm, − 0 mm (+ 0.25 in., − 0 in.).

5.3 Thickness tolerances shall be as specified in Table 2 when measured at any point at a temperature range from 23 to 30°C (73.4 to 86°F).

5.4 The film shall be natural in color and may vary from cloudy to milky transparent, depending upon thickness.

5.5 The material shall be essentially free of surface blisters, wrinkles, cracks, and other surface defects, unless otherwise agreed upon between purchaser and manufacturer.

5.6 One or both sides of the material shall be given a surface treatment to enable the surface to take adhesives or printing inks.

[1] This specification is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials.

Current edition approved November 10, 2001. Published January 2002. Originally published as D 3369 – 75. Last previous edition D 3369 – 96.

[2] *Annual Book of ASTM Standards*, Vol 10.01.

[3] *Annual Book of ASTM Standards*, Vol 08.01.

[4] *Annual Book of ASTM Standards*, Vol 08.02.

[5] *Annual Book of ASTM Standards*, Vol 08.03.

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

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TABLE 1 Property Requirements

Thickness,[A] mm (in.)	Tensile Strength, MPa (psi)	Elongation min, %	Melting Point, °C	Dielectric Strength,[B] min, V/mil	Electrical Flaws at 800 V/mil, per 30.5 m (100 ft) length, max
0.025 (0.001)	29.67 (4300)	400	327 ± 10	4200	8
0.051 (0.002)	29.67 (4300)	400	327 ± 10	4000	4
0.076 (0.003)	29.67 (4300)	400	327 ± 10	3400	2
0.102 (0.004)	31.05 (4500)	400	327 ± 10	3000	0
0.127 (0.005)	31.05 (4500)	370	327 ± 10	2400	...

[A] When intermediate thicknesses are specified, the property values shall be in accordance with agreement between purchaser and manufacturer.
[B] For thickness where dielectric strength has not been specified, interpolate on the basis of dielectric strength varying inversely as the square root of the thickness.

TABLE 2 Thickness Tolerance

Nominal Thickness, in.	Tolerance, plus or minus, mm (in.)
0.001	0.0025 (0.0001)
0.002 to 0.005, incl	0.0127 (0.0005)

6. Sampling

6.1 Sampling shall be statistically adequate to satisfy the requirements of 9.4.

7. Test Methods

7.1 *Conditioning*—For those tests where conditioning is required, condition the test specimens in accordance with Procedure A of Practice D 618 for a period of at least 4 h prior to test. If the test material has been exposed to temperatures below 20°C within 24 h prior to test, the conditioning shall be for at least 24 h.

7.2 *Test Conditions*—Conduct tests at the standard laboratory temperature of 23.0 ± 2°C (73.4 ± –3.6°F). The maintenance of constant humidity is not necessary. In reference cases, the standard atmosphere, 50 ± 5 % relative humidity, shall apply.

7.3 *Thickness*—Make measurements of thickness in accordance with Method A of Test Methods D 374.

7.4 *Melting Point*—Determine the melting point in accordance with Specification D 4895.

7.5 *Tensile Properties*—Determine the tensile strength and elongation in accordance with Specification D 4895, using five specimens.

7.6 *Dielectric Strength*—Determine the dielectric strength by testing five specimens in accordance with Test Method D 149, using the short-time test and the 6.25-mm (0.25-in.) diameter electrodes in air.

7.7 *Electrical Flaws*—Test Method D 1389, except use 12.7-mm (0.5-in.) wide sponge electrodes wet with 1 % saline solution in place of metal electrodes. Conduct the test on a specimen 7.6 m (25 ft) in length and if the specimen fails to meet requirements make a retest on two additional specimens each 30.5 m (100 ft) in length.

8. Number of Tests

8.1 One set of test specimens as prescribed in Section 7 shall be considered sufficient for testing each batch. The average result of the specimens tested shall conform to the requirements of this specification.

9. Inspection and Certification

9.1 Inspection and certification of the material supplied with reference to a specification based on this classification system shall be for conformance to the requirements specified herein.

9.2 Lot-acceptance inspection shall be the basis on which acceptance or rejection of the lot is made. The lot-acceptance inspection shall consist of those necessary to ensure the certifiability.

9.3 Periodic check inspection with reference to a specification based upon this classification system shall consist of the tests for all requirements of the material under the specification. Inspection frequency shall be adequate to ensure the material is certifiable in accordance with 9.4.

9.4 Certification shall be that the material was manufactured by a process in statistical control, sampled, tested, and inspected in accordance with this classification system, and that the average values for the lot meet the requirements of the specification (line callout).

9.5 A report of test results shall be furnished when requested. The report shall consist of results of the lot-acceptance inspection for the shipment and the results of the most recent periodic-check inspection.

10. Packaging and Package Marking

10.1 *Packaging*—The material shall be packaged in standard commercial containers so constructed as to ensure acceptance by common or other carriers for safe transportation at the lowest rate to the point of delivery, unless otherwise specified in the contract or order.

10.2 *Marking*—Shipping containers shall be marked with the name of the material, type, size, and quantity contained therein. Each roll of tape shall be marked to designate type, grade, and lot number. The marking will preferably be on the core.

10.3 All packing, packaging, and marking provisions of Practice D 3892 shall apply to this specification.

11. Keywords

11.1 dispersion PTFE; fluorocarbon; fluoropolymers; polymers; polytetrafluoroethylene; PTFE; PTFE basic shapes; PTFE cast film; PTFE film

SUMMARY OF CHANGES

This section identifies the location of selected changes to this specification. For the convenience of the user, Committee D20 has highlighted those changes that may impact the use of this specification. This section may also include descriptions of the changes or reasons for the changes, or both.

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(*1*) References to Specification D 3293 have been removed since it has been discontinued.

(*2*) Added Section 3 on Terminology.

(*3*) Sections following the new Section 3 have been renumbered.

(*4*) Reference to buyer/seller has been removed from 5.6.

(*5*) Section on Sampling has been changed.

(*6*) Sections for Inspection, Rejection and Rehearing, and Certification have been replaced with the new Section 9.

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