

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 3651A

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POLYTETRAFLUOROETHYLENE

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **FORM:** Extrusions, rod, sheet, sheet tape, film, film tape, tubing, molded shapes, or as ordered.
3. **APPLICATION:** Primarily for mechanical seals, chemical gaskets and high frequency electrical insulation at temperatures up to 500 F.

4. TECHNICAL REQUIREMENTS:

4.1 General:

- 4.1.1 **Color:** Unless otherwise specified, background color shall range from white to medium gray. Color of natural spotting shall range from pale gray to dark brown.

- 4.2 **Properties:** The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with listed ASTM methods, insofar as practicable.

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| 4.2.1 | Tensile Strength at 77 F + 2, psi, min | 1500 | ASTM D412-51T |
| 4.2.2 | Elongation at 77 F + 2, %, min | 100 | ASTM D412-51T |
| 4.2.3 | Stiffness at 77 F + 2, psi, min | 60,000 | ASTM D747-50 |
| 4.2.4 | Impact Value (notched),
Izod, ft-lb/in., min | | ASTM D256-47T |
| | at -70 F + 2 | 2.0 | |
| | at 77 F + 2 | 4.0 | |
| | at 170 F + 2 | 6.0 | |
| 4.2.5 | Water Absorption, %, max | 0.0 | ASTM D570-42 |
| 4.2.6 | Deformation Under Load at 122 F + 2
(1200 psi for 85 hr), %, max | 8 | ASTM D621-51 |
| 4.2.7 | Volume Resistivity at 50% R.H. and
77 F + 2, ohm-cm, min | 1.0×10^{15} | ASTM D257-52T |
| 4.2.8 | Dielectric Strength (short time test -
0.080 in. thick specimen), v/mil, min | 400 | ASTM D149-44 |
| 4.2.9 | Dielectric Constant at 60, 10 ³ , 10 ⁶ , 10 ⁸
Cycles, max | 2.0 | D150-47T |
| 4.2.10 | Power Factor at 60, 10 ³ , 10 ⁶ , 10 ⁸ Cycles, max | 0.0005 | D150-47T |
| 4.2.11 | Dimensional Stability: Unless otherwise specified, the product shall be capable of meeting the following requirement: When aged in air at 350 F + 2 for at least 1 hr per 1/4 in. of thickness, the product supplied shall not change dimension by more than 0.003 in. per inch of any dimensions shown on the drawing or purchase order. | | |

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5. QUALITY: The product shall be uniform in quality and condition, thoroughly sintered, clean, smooth, and free from foreign materials and from defects detrimental to fabrication, appearance or performance of parts.

6. TOLERANCES: Unless otherwise specified, the following tolerances apply.

6.1 Film and Film Tape:

Nominal Thickness Inch	Tolerance, Inch Plus and Minus
0.002 to 0.005, incl	0.0005
Over 0.005 to 0.010, incl	0.001

6.2 Sheet and Sheet Tape:

Ø Nominal Thickness Inches	Tolerance, Inch Plus and Minus
Over 0.010 to 0.016, incl	0.004
Over 0.016 to 0.031, incl	0.008
Over 0.031 to 0.062, incl	0.010
Over 0.062 to 0.093, incl	0.012
Over 0.093 to 0.125, incl	0.014
Over 0.125 to 0.157, incl	0.016
Over 0.157 to 0.188, incl	0.018
Over 0.188 to 0.250, incl	0.022
Over 0.250 to 0.375, incl	0.030
Over 0.375 to 0.500, incl	0.038
Over 0.500 to 0.625, incl	0.046
Over 0.625 to 0.750, incl	0.054
Over 0.750 to 1.000, incl	0.070
Over 1.000 to 1.250, incl	0.086
Over 1.250 to 1.500, incl	0.102
Over 1.500 to 1.750, incl	0.118
Over 1.750 to 2.000, incl	0.134
Over 2.000 to 2.250, incl	0.150

6.3 Molded Tubing:

Ø Nominal OD or ID Inches	ID Tolerance Inch Minus Only	OD Tolerance Inch Plus Only
2 and under	0.062	0.062
Over 2 to 3, incl	0.125	0.125
Over 3 to 5, incl	0.187	0.187

6.4 Molded Rod:

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	0.750 to 2.000, incl	0.062
	Over 2.000 to 3.000, incl	0.125
	Over 3.000 to 5.000, incl	0.187

6.5 Extruded Rod:

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	0.250 and under	0.008
	Over 0.250 to 0.500, incl	0.016
	Over 0.500 to 0.750, incl	0.020
	Over 0.750 to 1.000, incl	0.024
	Over 1.000 to 1.250, incl	0.030
	Over 1.250 to 1.500, incl	0.038
	Over 1.500 to 1.750, incl	0.046
	Over 1.750 to 2.000, incl	0.052
	Over 2.000 to 2.250, incl	0.068
	Over 2.250 to 2.500, incl	0.076

6.6 Extruded Tubing:

Nominal OD or ID Inches	ID Tolerance Inch Minus Only	OD Tolerance Inch Plus Only
Over 0.187 to 2, incl	0.062	0.062

7. REPORTS:

- 7.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product meets the requirements of this specification. This report shall include the purchase order number, material specification number, form or part number, and quantity.
- 7.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.