



# AEROSPACE MATERIAL SPECIFICATIONS

## AMS 3651C

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

485 Lexington Ave., New York, N. Y. 10017

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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:** Rods, tubes, sheets, moldings, extruded shapes, and machined parts.

3. **APPLICATION:** Primarily for seals, gaskets, and parts requiring chemical inertness and/or high frequency electrical insulating properties at temperatures up to 260 C (500 F).

4. **TECHNICAL REQUIREMENTS:**

4.1 **General:**

4.1.1 **Color:** Unless otherwise specified, background color may 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 the issue of specified ASTM methods listed in the latest issue of AMS 2350, insofar as practicable. Only the tests of 4.2.1, 4.2.2, 4.2.7, and 4.2.10 will be required for routine control.

4.2.1	Tensile Strength at 23 C + 1 ∅ (73.4 F + 1.8), psi, min	1500	See Note 1
4.2.2	Elongation at 23 C + 1 ∅ (73.4 F + 1.8) %, min	75	See Note 1
4.2.3	Stiffness at 23 C + 1 ∅ (73.4 F + 1.8) psi, min	45,000	ASTM D747
4.2.4	Impact Strength at 23 C + 1 ∅ (73.4 F + 1.8) ft-lb per in. of notch, min	2.0	ASTM D256, Method A
4.2.5	Deformation Under Load at ∅ 50 C + 1 (122 F + 1.8) (2000 psi for 85 hr), %, max	30	ASTM D621
4.2.6	Volume Resistivity at 50% R. H. ∅ and 23 C + 1 (73.4 F + 1.8), ohm-cm, min	1.0 x 10 <sup>14</sup>	ASTM D257
4.2.7	Dielectric Strength (short time ∅ test, 0.125 in. thick specimen), v per mil, min	350	ASTM D149
∅ 4.2.8	Dielectric Constant at 10 <sup>6</sup> cycles	1.95 - 2.15	ASTM D150
∅ 4.2.9	Power Factor at 10 <sup>6</sup> cycles, max	0.005	ASTM D150

## Ø 4.2.10 Specific Gravity

2.10 - 2.22

ASTM D792

Add 2 drops of a wetting agent to the water

- 4.2.11 Dimensional Stability: When stabilization is specified, the product shall be capable of meeting the following requirements: When aged in air at  $175\text{ C} \pm 1$  ( $347\text{ F} \pm 2$ ) for not less than 1 hr per 1/4 in. of thickness or cross section, whichever is greater, and cooled at a rate not greater than 25 C (45 F) per hr, the product supplied shall not change dimension by more than the values shown in the following table, when measured after specimen has cooled to  $23.9 - 29.4\text{ C}$  ( $75 - 85\text{ F}$ ).

4.2.11.1 Rounds:

Nominal Diameter Inches	Change in Diameter in. per in. , max
Up to 1.0, incl	0.0030
Over 1.0 to 3.0, incl	0.0035
Over 3.0 to 5.0, incl	0.0040
Over 5.0 to 7.0, incl	0.0045
Over 7.0 to 12.0, incl	0.0050

  

Length of Specimen Inch	Change in Length in. per in. , max
Up to 0.200, incl	0.0030
Over 0.200 to 0.400, incl	0.0035
Over 0.400 to 0.600, incl	0.0040
Over 0.600 to 0.800, incl	0.0045
Over 0.800 to 1.000, incl	0.0050

4.2.11.2 Other than Round:

Length of Specimen or Nominal Cross-Sectional Dimension, Inch	Change in Dimension in. per in. , max
Up to 0.200, incl	0.0030
Over 0.200 to 0.400, incl	0.0035
Over 0.400 to 0.600, incl	0.0040
Over 0.600 to 0.800, incl	0.0045
Over 0.800 to 1.000, incl	0.0050

Note 1. Specimen shall be cut using Die "A" of ASTM D412, initial jaw separation shall be 4-1/2 in. , and jaw separation rate shall be 1.0 in. per minute.

5. QUALITY: The product shall be uniform in quality and condition, clean, smooth, as free from foreign materials as commercially practicable, and free from imperfections detrimental to fabrication, appearance, or performance of parts.
- Ø 6. TOLERANCES: Unless otherwise specified, the following tolerances apply at  $23 - 30\text{ C}$  ( $73.4 - 86\text{ F}$ ).

6.1 Sheet:

Nominal Thickness Inches	Tolerance, Inch	
	plus	minus
Over 0.010 to 0.016, incl	0.004	0.002
Over 0.016 to 0.031, incl	0.008	0.004
Over 0.031 to 0.062, incl	0.010	0.005
Over 0.062 to 0.093, incl	0.012	0.006
Over 0.093 to 0.125, incl	0.014	0.007
Over 0.125 to 0.157, incl	0.016	0.008
Over 0.157 to 0.188, incl	0.018	0.009
Over 0.188 to 0.250, incl	0.022	0.011
Over 0.250 to 0.375, incl	0.030	0.015
Over 0.375 to 0.500, incl	0.038	0.019
Over 0.500 to 0.625, incl	0.046	0.023
Over 0.625 to 0.750, incl	0.054	0.027
Over 0.750 to 1.000, incl	0.070	0.035
Over 1.000 to 1.250, incl	0.086	0.043
Over 1.250 to 1.500, incl	0.102	0.051
Over 1.500 to 1.750, incl	0.118	0.059
Over 1.750 to 2.000, incl	0.134	0.067
Over 2.000 to 2.250, incl	0.150	0.075

6.2 Molded Tubing:

Nominal OD or ID Inches	ID Tolerance, Inch	OD Tolerance, Inch
	Minus Only	Plus Only
Up to 2, incl	0.062	0.062
Over 2 to 3, incl	0.125	0.125
Over 3 to 5, incl	0.187	0.187
Over 5 to 12, incl	0.250	0.250

6.3 Molded Rod:

Nominal Diameter Inches	Tolerance, Inch
	Plus Only
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
Over 5.000 to 12.000, incl	0.250

6.4 Extruded Rod:

Nominal Diameter Inches	Tolerance, Inch
	Plus Only
Up to 0.250, incl	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