AEROSPACE MATERIAL SPECIFICATION

AMS3670™/4	REV. D

Issued 1984-07
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Superseding AMS3670/4C

(R) Bar, Rod, and Shapes Produced from 30% Glass Fiber Filled Polyamide-Imide (PAI) Material

RATIONALE

This standard has been updated to include technical and editorial changes.

1. SCOPE

1.1 Form

This specification covers molded or extruded bar, rod, and shapes produced from a polyamide-imide (PAI) polymer filled with 30% glass fiber. This is designated as Grade 4 material per AMS3670.

1.2 Application

These products have been used typically for parts requiring high strength, thermal resistance, good dielectric properties, and toughness up to 446 °F (230 °C), but usage is not limited to such applications. Each application should be considered individually.

1.3 Type

The type shall designate the process used to produce the bar, rod, or shapes.

Type I Bar, rod, or shapes produced via the injection molded process or raw material used to produce the shapes.

Type II Bar, rod, or shapes produced via the extrusion process.

Type III Bar, rod, or shapes produced via the compression molding process.

When no type is specified, Type I shall be supplied.

2. APPLICABLE DOCUMENTS

Refer to AMS3670.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
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https://www.sae.org/standards/content/AMS3670/4D/

3. TECHNICAL REQUIREMENTS

3.1 Basic Specification

The complete requirements for procuring the product described herein shall consist of this document and the latest issue of the basic specification, AMS3670.

3.2 Material

Shall be a polyamide-imide polymer filled with 30% ± 3% by weight glass fiber molded or extruded into bar, rod, or shape.

3.3 Properties

The bar, rod, shapes, and raw material shall conform to the requirements shown in Table 1. Physical properties shall be determined on test specimens specified in the parts standard, drawing, or purchase document. If not specified, determined on post-cured test specimens produced by the indicated process and in accordance with specified test methods shall be used. Specimens for elevated temperature tests shall be held at the test temperature for not less than 30 minutes prior to testing. Values for tensile strength, elongation, flexural strength, and compressive strength shall be reported as the average of three determinations for each test; no individual value shall be less than 90% of the minimum value specified.

Table 1 - Properties

	Property	Type I	Type II	Type III	Test Method
3.3.1	Color	Dark brown, as approved on preproduction sample	Dark brown, as approved on preproduction sample	Dark brown, as approved on preproduction sample	
3.3.2	Tensile strength, min avg At 73 °F ± 2 °F (23 °C ± 1 °C) At 446 °F ± 9 °F (230 °C ± 5 °C)	 25.0 ksi (172 MPa) 13.0 ksi (89.6 MPa)	 20.0 ksi (137 MPa)	 12 ksi (82.7 MPa)	 ASTM D1708, Speed B, 1/8 inch specimen
3.3.3	Elongation, min avg At 73 °F ± 2 °F (23 °C ± 1 °C)	 4%	 4%	 4%	ASTM D1708, Speed B, 1/8 inch specimen
3.3.4	Tensile modulus, min At 73 °F ± 2 °F (23 °C ± 1 °C)	 1.5 Msi (10.3 GPa)	 0.9 MSi (6.2 GPa)	 0.8 Msi (5.5 GPa)	ASTM D1708, Speed B, 1/8 inch specimen
3.3.5	Flexural strength, min avg At 73 °F ± 2 °F (23 °C ± 1 °C) At 446 °F ± 9 °F (230 °C ± 5 °C)	 42.0 ksi (290 MPa) 24.0 ksi (165 MPa)	 27.0 ksi (186 MPa)	 18.0 ksi (124 MPa)	 ASTM D790 or ASTM D790M
3.3.6	Compressive strength, min avg At 73 °F ± 2 °F (23 °C ± 1 °C)	 29.0 ksi (200 MPa)	 37.0 ksi (255 MPa)	 25.0 ksi (172 MPa)	ASTM D695 or ASTM D695M
3.3.7	Specific gravity At 73 °F ± 2 °F (23 °C ± 1 °C)	 1.58 to 1.63	 1.58 to 1.63	 1.58 to 1.63	ASTM D792 Method A
3.3.8	Water absorption, max 24.0 to 24.5 hours At 73 °F ± 2 °F (23 °C ± 1 °C)	 0.4%	 0.4.%	 0.4%	 ASTM D570
3.3.9	Heat deflection temperature, min 1/8 inch (3.2 mm) specimen 264 psi (1.8 MPa) fiber stress	 500 °F (260 °C)	 500 °F (260 °C)	 500 °F (260 °C)	 ASTM D648
3.3.10	Dielectric strength, min avg dry, short time test, 1/8 inch (3.2 mm) specimen	 700 Volts/mil (27.6 kV/mm)	 650 Volts/mil (25.6 kV/mm)	 650 Volts/mil (25.6 kV/mm)	 ASTM D149
3.3.11	Dissipation factor, max 103 Hz	 0.04	 0.05	 0.05	ASTM D150
3.3.12	Dielectric constant, max 103 Hz	 4.0 to 5.5	 4.0 to 5.5	 5.0 to 6.5	ASTM D150