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400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 3670A

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Superseding AMS 3670

POLYAMIDE-IMIDE BAR, ROD, AND SHAPES
Molded or Extruded

1. SCOPE:

1.1 Form: This specification and its supplementary detail specifications cover a polyamide-imide plastic in the form of bar, rod, and shapes.

1.2 Application: Primarily for parts requiring low coefficient of friction, thermal resistance, and toughness up to 250°C (480°F).

1.3 Classification: The requirements specified herein and in the applicable detail specification define each product on the basis of the filler used with the same base polyamide-imide polymer. The presence of filler and the material used as filler are specified in the title of each detail specification.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D149 - Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D150 - AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials
ASTM D570 - Water Absorption of Plastics
ASTM D648 - Deflection Temperature of Plastics Under Flexural Load
ASTM D695 - Compressive Properties of Rigid Plastics
ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D792 - Specific Gravity and Density of Plastics by Displacement
ASTM D1708 - Tensile Properties of Plastics by Use of Microtensile Specimens

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Detail Specifications: The requirements for a specific product shall consist of all requirements specified herein in addition to requirements specified in the applicable detail specification. In case of conflict between requirements of this specification and an applicable detail specification, the requirements of the detail specification shall govern.

3.2 Material: Product shall be manufactured from virgin, unplasticized polymer polyamide-imide, unfilled or filled as specified in the applicable detail specification, ready for machining and use, and post cured to meet requirements of 3.4.

3.3 Color: Shall be natural and may vary as specified in the applicable detail specification depending on the filler material used.

3.4 Properties: Shall conform to the requirements of this specification and the applicable detail specification; tests shall be performed on molded test specimens and in accordance with specified test methods; properties on parts shall be as agreed on between purchaser and vendor:

Tensile Strength	ASTM D1708
Elongation	ASTM D1708
Compressive Strength	ASTM D695
Flexural Strength	ASTM D790
Specific Gravity	ASTM D792, Method A
Water Absorption	ASTM D570
Heat Deflection	ASTM D648
Dielectric Strength	ASTM D149
Dissipation Factor	ASTM D150
Dielectric Constant	ASTM D150

3.4.1 Dimensional Stability: Dimensions of raw stock or fabricated parts shall not change more than 0.001 in. per in. (0.001 mm/mm), measured at 20° - 30°C (68° - 86°F) before and after being held for 24 ± 0.5 at 250°C + 5 (480°F + 10) in air. Before initial measurement, specifications shall be conditioned at 150°C ± 5 (300°F ± 10) for 70 hr ± 0.5.

3.5 Quality: The product, as received by purchaser, shall be uniform in quality and condition, smooth, and free from foreign materials and from imperfections detrimental to usage of the product.

3.6 Tolerances: Shall be as follows, determined at 20° - 30°C (68° - 86°F) except that closer temperature control may be required for large dimensions:

TABLE I

Nominal Diameter Inches	Diameter Tolerance, Inch plus only
0.250 to 1.000, incl	0.025
Over 1.000 to 2.000, incl	0.050
Over 2.000 to 3.500, incl	0.070
Over 3.500	As specified by purchaser

TABLE I (SI)

Nominal Diameter Millimetres	Diameter Tolerance, Millimetres plus only
6.25 to 25.00, incl	0.62
Over 25.00 to 50.00, incl	1.25
Over 50.00 to 87.50, incl	1.75
Over 87.50	As specified by purchaser

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements of the applicable detail specification for tensile strength and elongation at 23°C (73°F) and for specific gravity are classified as acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification and the applicable detail specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient product shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 A lot shall be all product produced in a single production run from the same batch of polymer and presented for vendor's inspection at one time. An inspection lot may contain product of varying sizes but shall not exceed 6000 lb (2725 kg). A lot may be packaged and delivered in smaller quantities under the basic lot approval provided lot identification is maintained.

4.3.1.2 When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report 4.5.1 shall state that such plan was used.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample material shall be approved by purchaser before material for production use is supplied, unless such approval be waived by purchaser. Results of tests on production material shall be essentially equivalent to those on the approved sample material.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production material which are essentially the same as those used on the approved sample material. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed change in material, processing, or both and, when requested, sample material. Production material made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports: