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400 COMMONWEALTH DRIVE WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3617B
Superseding AMS 3617A

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NYLON PLASTIC MOLDINGS AND EXTRUSIONS

1. SCOPE:

1.1 Form: This specification covers one type of nylon thermoplastic resin in the form of moldings and extrusions.

1.2 Application: Primarily for mechanical parts requiring high strength and resistance to aircraft fuels and lubricants up to 250°F (120°C).

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) 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 D256 - Impact Resistance of Plastics and Electrical Insulating Materials
ASTM D570 - Water Absorption of Plastics
ASTM D638 - Tensile Properties of Plastics
ASTM D648 - Deflection Temperature of Plastics Under Flexural Load
ASTM D789 - Nylon Injection Molding and Extrusion Materials
ASTM D790 - Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D792 - Specific Gravity and Density of Plastics by Displacement

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 Material: Shall be a nylon resin with any necessary fillers, modifiers, and plasticizers necessary to meet the other technical requirements of this specification.

3.1.1 Color: Shall be light cream, opaque.

3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable:

3.2.1 Tensile Strength, min — ASTM D638

Nominal Thickness		
Inches	(Millimetres)	
Up to 0.375, excl	(Up to 9.50, excl)	9,000 psi (62 MPa)
0.375 and over	(9.50 and over)	11,000 psi (76 MPa)

3.2.2 Elongation, min — ASTM D638

Nominal Thickness		
Inches	(Millimetres)	
Up to 0.187, excl	(Up to 4.75, excl)	50%
0.187 and over	(4.75 and over)	25%

3.2.3 Flexural Modulus of Elasticity (Tangent), min	310,000 psi (2140 MPa)	ASTM D790
3.2.4 Impact Resistance per unit of notch, min	0.8 ft-lb per in. (42.7 J/m)	ASTM D256, Method A
3.2.5 Deflection Temperature, min at 264 psi (1.82 MPa) fiber stress	150°F (66°C)	ASTM D648
3.2.6 Water Absorption (24 hr immersion), wt gain, max	1.5%	ASTM D570
3.2.7 Specific Gravity at 73°/73°F (23°/23°C)	1.13 - 1.15	ASTM D792, Method A

3.2.8 Melting Point		482° - 500°F (250° - 260°C)	ASTM D789

3.2.9 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.

3.2.10 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service, determined by a procedure agreed upon by purchaser and vendor.

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

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 Ø 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 for Ø tensile strength (3.2.1), elongation (3.2.2), specific gravity (3.2.7), and melting point (3.2.8) 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 are classified as preproduction tests Ø and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in material or 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 ø or, if not specified therein, not less than three. When the product is of such size or shape that suitable specimens cannot be obtained, separate specimens shall be supplied upon request. Such specimens shall be injection molded from the same batch of molding powder and under conditions representative of those used in making the product.

4.3.1.1 A lot shall be all product from the same batch of molding powder processed in one continuous run and presented for vendor's inspection at one time.

4.3.1.2 A batch of molding powder shall be all powder produced in one continuous set of operations.

4.3.1.3 When a statistical sampling plan and acceptance quality level (AQL) have ø 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 of 4.5.1 shall state that such plan was used.

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

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.

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 changes in material or 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:

4.5.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 3617B, vendor's compound number, form and size or part number, and quantity.