Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS3628B
Superseding AMS 3628A
Issued 1-31-64
Revised 10-15-79

PLASTIC EXTRUSIONS AND MOLDINGS, POLYCARBONATE
General Purpose

1. SCOPE:

1.1 Form: This specification covers a polycarbonate resin in the form of extrusions and moldings.

1.2 Application: Primarily for mechanical parts requiring high impact strength from -54°C to +135°C (-65°F to +275°F), clarity, high strength, and dimensional stability. These products are sensitive to some solvents; each application must be evaluated on its own merits.

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 specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 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 D621 - Deformation of Plastics Under Load
ASTM D635 - Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
ASTM D638 - Tensile Properties of Plastics
ASTM D648 - Deflection Temperature of Plastics Under Flexural Load
ASTM D790 - Flexural Properties of Plastics and Electrical Insulating Materials
ASTM D792 - Specific Gravity and Density of Plastics by Displacement

2.3 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 polycarbonate resin with fillers, plasticizers, and modifiers necessary to meet the requirements of 3.2 and 3.3.

3.2 Color: Shall be transparent with a water-white or light straw color, unless otherwise ordered.

3.3 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:

3.3.1 Tensile Properties:		ASTM D638, Speed C
Tensile Strength, min	8000 psi (55.2 MPa)	
Yield Strength, min	7000 psi (48.3 MPa)	
Elongation at Rupture, min	60%	
3.3.2 Flexural Modulus of Elasticity (tangent), min	330,000 psi (2275 MPa)	ASTM D790
3.3.3 Flexural Strength, min	11,000 psi (75.8 MPa)	ASTM D790
3.3.4 Impact Strength:		ASTM D256, Method A
3.3.4.1 Notched, min	12 ft-lb/in. (641 J/m)	
3.3.4.2 Unnotched, min	60 ft-lb/in. (3202 J/m)	
3.3.5 Deflection Temperature at 264 psi (1.82 MPa) fiber stress, min	262° F (128° C)	ASTM D648
3.3.6 Time of Burning, max	5 sec	ASTM D635
3.3.7 Water Absorption, 24 hr immersion at 73° F ± 2 (23° C ± 1), max	0.35%	ASTM D570
3.3.8 Specific Gravity at 23° /23° C (73° /73° F)	1.19 - 1.21	ASTM D792
3.3.9 Deformation Under Load, max		ASTM D621
3.3.9.1 4000 psi (27.6 MPa) at 77° F ± 2 (25° C ± 1)	0.3%	
3.3.9.2 4000 psi (27.6 MPa) at 158° F ± 2 (70° C ± 1)	1.1%	

3.3.10 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metals shall not be considered objectionable. Method of test and standards for acceptance shall be as agreed upon by purchaser and vendor.

3.4 Quality: The product shall be uniform in quality and condition, smooth, and free from internal and external imperfections detrimental to fabrication, appearance, or performance of parts.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples 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 perform such confirmatory testing as he deems 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 tensile properties (3.3.1), ø impact strength (3.3.4), and specific gravity (3.3.8) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification tests and shall be performed on the initial shipment of ø a product to a purchaser, when a change in material or processing 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, qualification ø test material shall be submitted to the cognizant qualification 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 tests for each requirement shall be as specified in the applicable test ø procedure 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 of the same size and configuration or the same part number from the same batch of molding powder produced in one continuous run and presented for vendor's ø inspection at one time but shall not exceed 200 lb (90 kg). A lot may be packaged or delivered in small quantities under the basic lot approval as long as the lot identification is maintained.

ø 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 been agreed upon by ø 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.

4.3.1.4 Specimens for impact strength (3.3.4) shall be nominally 1/2 x 1/8 in. (13 x 3 mm).

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

4.3.2.1 Specimens for time of burning test (3.3.6) shall be nominally 1/8 in. (3 mm) thick.

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. 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. ø 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 and processing 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, material specification number and its revision letter, vendor's compound number, form, size or part number, and quantity.

4.5.2 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 and its revision letter, contractor or other direct supplier of material, supplier's compound number, 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.

4.6 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Product Identification:

5.1.1 Moldings: Each molding of suitable size shall have the part number molded or permanently impressed therein. If size or configuration precludes integral marking, moldings of each different part number shall be packaged in separate, suitable containers marked with the part number.

5.1.2 Extrusions: Each extrusion shall be marked near one end or, if coiled, near the outside end with the manufacturer's designation and AMS 3628B.

5.2 Packaging and Package Identification:

5.2.1 Packaging shall be accomplished in such a manner as to ensure that the product, during shipment and storage, will not be distorted and will be protected against damage from exposure to moisture, weather, or any other normal hazard.

5.2.2 Each package shall be permanently and legibly marked to show not less than the following information:

PLASTIC EXTRUSIONS AND MOLDINGS, POLYCARBONATE
AMS 3628B
SIZE OR PART NUMBER_____
QUANTITY_____
PURCHASE ORDER NUMBER_____
MANUFACTURER'S IDENTIFICATION_____
COMPOUND NUMBER_____

5.2.3 Packages shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.