



# AEROSPACE MATERIAL

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

## SPECIFICATION

### AMS 3641B

Superseding AMS 3641A

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#### PLASTIC MOLDINGS, THERMOSETTING Phenol/Formaldehyde, Macerated-Fabric-Filled

##### 1. SCOPE:

1.1 Form: This specification covers one type of macerated-fabric-filled, thermosetting, phenol/formaldehyde resin in the form of compression or transfer moldings.

1.2 Application: Primarily for parts requiring good mechanical properties, particularly impact strength.

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 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 D651 - Tensile Strength of Molded Electrical Insulating Materials

ASTM D695 - Compressive Properties of Rigid Plastics

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 phenol/formaldehyde resin with macerated fabric filler and other additives necessary to meet the requirements of 3.2 and 3.3.

3.2 Color: Shall be black, opaque, except when specified to be natural, brown, or red.

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

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|--|-----------------------------------|------------------------|
| 3.3.1 Tensile Strength, min  | 6,000 psi (41.4 MPa)              | ASTM D651              |
| 3.3.2 Compressive Strength, min  | 18,000 psi (124 MPa)              | ASTM D695              |
| 3.3.3 Flexural Strength  | 9,000 psi (62.1 MPa)              | ASTM D790              |
| 3.3.4 Impact Resistance per unit of notch, min   | 1.75 ft-lb per inch<br>(93.4 J/m) | ASTM D256,<br>Method A |
| 3.3.5 Water Absorption (24 hr immersion), max  | 1.75%                             | ASTM D570              |
| 3.3.6 Specific Gravity<br>at 23°/23°C (73°/73°F)   | 1.35 - 1.45                       | ASTM D792,<br>Method A |
| 3.3.7 <u>Weathering</u> : When specified, moldings shall have weather resistance acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.   |                                   |                        |
| 3.3.8 <u>Corrosion</u> : Moldings 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 <u>Quality</u> : Moldings 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 moldings 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 moldings conform to the requirements of this specification.

#### 4.2 Classification of Tests:

- 4.2.1 Acceptance Tests: Tests to determine conformance to the following requirements are classified as acceptance tests and shall be performed on each lot of product:

Requirement	Paragraph Reference
Tensile Strength	3.3.1
Specific Gravity	3.3.6

- 4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification tests and may be the basis for approval of the product (See 4.4.1).

- 4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, qualification 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: Sufficient moldings 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 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 molded from the same batch of molding powder and under conditions representative of those used in making the product.

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

- Ø 4.3.2 A batch of molding powder shall be all powder produced in one continuous set of operations.

4.4 Approval:

- 4.4.1 Sample moldings shall be approved by purchaser before moldings for production use are supplied, unless such approval be waived. Results of tests on production moldings shall be essentially equivalent to those on the approved samples.

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

4.5 Reports:

- 4.5.1 The vendor of moldings 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 moldings  
Ø conform to the other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, vendor's compound number, form and 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 moldings, part number, and quantity. When moldings for making parts are produced or purchased by the parts vendor, that vendor shall inspect each lot of moldings to determine conformance to the requirements of this specification, and shall include in the report a statement that the moldings conform, 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 moldings may be based on the results of testing three additional specimens for  
Ø each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the moldings 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  
Ø therein. If size precludes integral marking, moldings of each different part number shall be packed in separate, suitable containers marked with the part number.

5.2 Packaging and Package Identification:

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