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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

# AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3296A

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Superseding AMS 3296

Submitted for recognition as an American National Standard

## DIGLYCIDYL ESTER RESIN

1. SCOPE:

1.1 Form:

This specification covers a prepolymer in the form of a low molecular weight aromatic diglycidyl ester resin.

1.2 Application:

This resin has been used typically in the manufacture of composite matrices, but usage is not limited to such applications.

1.3 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2825 Material Safety Data Sheets

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM D 1652 Epoxy Content of Epoxy Resins
ASTM D 1726 Hydrolyzable Chloride Content of Liquid Epoxy Resins
ASTM D 2393 Viscosity of Epoxy Resins and Related Components

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-2073-1 DoD Materiel, Procedures for Development and Application of Packaging Requirements

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a low molecular weight, aromatic diglycidyl ester resin partially derived from phthalic anhydride reacted with epichlorohydrin to initially form diglycidyl phthalate and subsequently a polyepoxide.

3.2 Impurities:

Resin shall be substantially free of foreign matter and shall contain not more than 1% hydrolyzable chlorine, determined in accordance with ASTM D 1726.

3.3 Properties:

Resin shall conform to requirements shown in Table 1, determined in accordance with specified ASTM methods.

TABLE 1 - Properties

| Paragraph | Property | Requirement | Test Method |
|---|---|---|---|
| 3.3.1 | Epoxy Content, equivalent per 100 grams | 0.556 - 0.667 | ASTM D 1652 |
| 3.3.2 | Viscosity at 25 °C (77 °F), cps | 600 - 1800 | ASTM D 2393 |

3.4 Quality:

The resin, as received by purchaser, shall be uniform in quality and condition, and free from foreign materials and from contaminants detrimental to usage of the resin.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

(R) The vendor of the resin shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the resin conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests for all technical requirements are acceptance tests and preproduction tests and shall be performed prior to or on the initial shipment of resin to a purchaser, on each lot, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing:

(R) Shall be as follows:

4.3.1 For Acceptance Tests: Each lot of resin shall be sampled at random to provide sufficient resin 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 resin produced in a continuous production run from the same batches of raw materials under the same fixed conditions and presented for vendor's inspection at one time.

4.3.1.2 A batch shall be the quantity of material run in a reactor or mixer at one time.

4.3.1.3 (R) When a statistical sampling plan has 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 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 resin shall be approved by purchaser before resin for production use is supplied, unless such approval be waived by purchaser. Results of tests on production resin 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 resin which are essentially the same as those used on the approved sample. 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 ingredients and/or processing and, when requested, sample resin. Production resin made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports:

The vendor of resin shall furnish with each shipment a report showing the results of tests to determine conformance to the technical requirements. This report shall include the purchase order number, lot number, AMS 3296A, vendor's product designation, date of manufacture, and quantity.

4.5.1 A material safety data sheet conforming to AMS 2825, or equivalent, shall be supplied to each purchaser prior to, or concurrent with, the report of preproduction test results or, if preproduction testing be waived by purchaser, concurrent with the first shipment of resin for production use. Each request for modification of resin formulation shall be accompanied by a revised data sheet for the proposed formulation.

4.6 Resampling and Retesting:
(R)

If any specimen used in the above tests fails to meet the specified requirements, disposition of the resin 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 resin represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification and Packaging:

5.1.1 A lot of resin may be packaged in small quantities and delivered under the basic lot approval provided lot identification is maintained.

5.1.2 The resin shall be packaged in air-tight containers and stored away, or otherwise protected, from excessive heat and humidity. Type and size of containers shall be as agreed upon by purchaser and vendor.

5.1.3 Each container of resin shall be legibly identified, with not less than the following information, on an attached label using characters which will not be obliterated by normal handling:

DIGLYCIDYL ESTER RESIN
AMS 3296A
MANUFACTURER'S IDENTIFICATION _____
PURCHASE ORDER NUMBER _____
DATE OF MANUFACTURE _____
LOT NUMBER _____
QUANTITY _____
STORE AWAY FROM EXCESSIVE HEAT AND HUMIDITY