



AEROSPACE MATERIAL SPECIFICATION

AMS3895™

REV. C

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Superseding AMS3895B

Broadgoods and Tape, Carbon Fiber-Epoxy Resin Impregnated
Multi-Ply, Uniform Fiber

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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1. SCOPE:**1.1 Form:**

This specification covers epoxy-resin-impregnated carbon-fiber broadgoods and tape in the form of multi-ply unidirectional layers constructed from the same or uniform fibers and supplied as broadgood rolls, tape, or cut sheet. The individual ply orientation shall be as ordered.

1.2 Application:

These products have been used typically for fabricating high-strength and high-modulus composite parts, using either hand-layup or a machine for automated-tape-layup, 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

AMS 3894 Carbon Fiber Tape and Sheet, Epoxy Resin Impregnated

AMS 3898 Interleaf Carrier Material, Composite Tape

2.2 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

2.3 AIA Publications:

Available from National Standards Association, Inc., 1321 14th Street, N.W., Washington, DC 20005.

NAS 992 Reel, Composite Filament Tape, Automated Machine Layup

3. TECHNICAL REQUIREMENTS:

3.1 Material:

3.1.1 The product shall consist of superimposed, unidirectional plies of epoxy-resin impregnated carbon-fiber broadgoods or tape. Each ply shall conform to the requirements of AMS 3894 and its applicable detail specification, and shall be of the orientation specified.

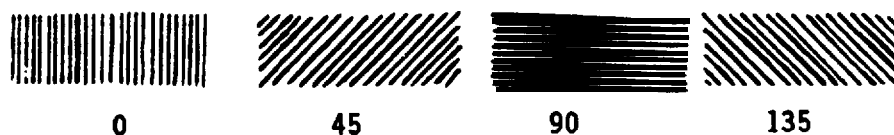
3.1.1.1 When specified, the broadgoods product shall be supplied in sheet form of specified length and width.

3.1.2 Designation: Each product construction shall be identified by the fiber/impregnating resin specification number, followed by the individual ply direction in brackets, each ply indicated by the direction code, as follows: (See 8.2 for examples)

a. Fiber/impregnation resin detail specification: 3894/*

* = Detail Specification number, as applicable.

- b. Ply direction:
- 0 = longitudinal fiber direction
 - 45 = 45 degrees from longitudinal, (right bias, often designated +45)
 - 90 = 90 degrees or perpendicular
 - 135 = 135 degrees from longitudinal, (left bias, often designated -45)



- c. Number of plies:
- (0) = One ply, longitudinal
 - (0/0) = Two plies, longitudinal

3.1.2.1 Example:

3894/2 (0/45/90) = Three ply, AMS 3894/2 in each ply, longitudinal (0 degree) fiber direction in first (bottom) ply, right bias (45 degree) fiber direction in second (center) ply, and perpendicular (90 degree) fiber direction in third (top) ply.

3.2 Storage Life:

The product shall meet the requirements of 3.4 when tested at any time up to three months from date of receipt by purchaser provided it has been stored in the original sealed bags at a temperature not higher than -18 °C (0 °F).

3.3 Working Life:

The product shall meet the requirements of 3.4 when tested after continuous exposure for 14 days within the relative humidity and temperature limits shown in Figure 1.

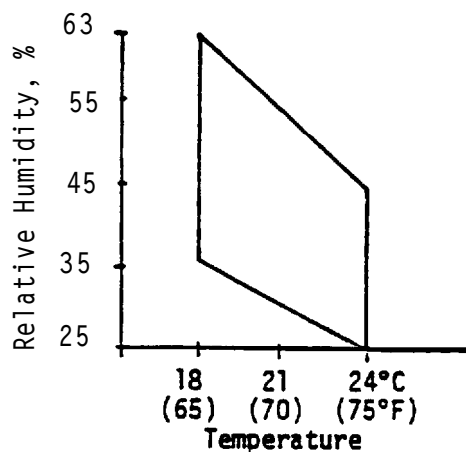


FIGURE 1

3.4 Properties:

The product shall conform to the requirements of AMS 3894 and its applicable detail specification and the following:

3.4.1 Uncured Product: Tests shall be performed on the product supplied, after warming to above the dew point prior to opening the heat sealed bag for sampling, and in accordance with the test procedures specified herein and in AMS 3894, as applicable.

3.4.1.1 Bending: The product shall withstand, without visible material damage, bending through an angle of 180 degrees around a 1.0-inch (25-mm) diameter mandrel with the 0 degree ply direction perpendicular to the axis of bend; 10X magnification shall be used in examination for damage.

3.4.1.2 Tack, Time Adherence: Specimens shall adhere for not less than 30 minutes, determined in accordance with 4.5.2.

3.4.1.3 Tack, Peel Strength: Shall be the preproduction value established as in 4.4.1 $\pm$ 10% determined in accordance with 4.5.3.

3.4.2 Cured Laminate: When required by purchaser, tests shall be performed on specimens cut from laminates prepared in accordance with 4.5.1.

3.5 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, free from foreign materials, and, in addition to the requirements of 3.5.1, free from imperfections detrimental to usage of the product.

3.5.1 Visual Inspection Criteria: Shall be as shown in Table 1. In addition to the requirements specified in AMS 3894 and its applicable detail specification for each ply, visible indications of voids between plies, incorrectly positioned impregnated material (excessive gap or overlap), or irregular interleaf carrier shall be unacceptable if the total length of each area exceeds limits indicated in Table 1, determined in accordance with 4.5.4. Examination of interior plies may be made by any suitable nondestructive method, such as radiographic inspection, agreed upon by purchaser and supplier.