



AEROSPACE MATERIAL SPECIFICATION

AMS3849™

REV. C

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Superseding AMS3849B

Cloth, Quartz, Style 581 Fabric
Hot-Melt, Addition-Type, Polyimide Resin Impregnated

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 one type of quartz cloth impregnated with a heat-reactive, thermosetting, hot-melt, addition-type, polyimide resin system, furnished in continuous rolls of full width material.

1.2 Application:

This cloth has been used typically for structural laminates requiring high strength, excellent electrical resistance, and heat resistance for long-term service up to 230 °C (446 °F) and short-time service up to 260 °C (500 °F), 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 3846 Cloth, Quartz, Finished for Resin Laminates

2.2 ASTM Publications:

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

ASTM D 150 A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials
ASTM D 638 Tensile Properties of Plastics
ASTM D 638M Tensile Properties of Plastics (Metric)
ASTM D 695 Compressive Properties of Rigid Plastics
ASTM D 695M Compressive Properties of Rigid Plastics (Metric)
ASTM D 790 Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM D 790M Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials (Metric)
ASTM D 792 Specific Gravity (Relative Density) and Density of Plastics by Displacement
ASTM D 2344 Apparent Interlaminar Shear Strength of Parallel Fiber Composites by Short Beam Method
ASTM D 2584 Ignition Loss of Cured Reinforced Resins
ASTM D 2734 Void Content of Reinforced Plastics
ASTM D 3531 Resin Flow of Carbon Fiber-Epoxy Prepreg

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 the reinforcement specified in 3.1.1, impregnated with the resin system specified in 3.1.2, supplied in rolls of full width impregnated cloth or slit tape, as ordered.

3.1.1 Reinforcement: Shall be Style 581 quartz cloth conforming to AMS 3846, treated with a suitable finish to produce the required performance characteristics with the resin system specified herein.

3.1.2 Resin: Shall be a 100% reactive, hot-melt, resin system formed by co-reaction of bis-maleimide monomer with a tri-functional monomer and an aromatic diamine, resulting in a thermosetting resin system which thermally cures to form a polyimide structure.

3.2 Storage Life:

The impregnated cloth shall have a storage life of not less than three months from date of shipment when stored or shipped in a barrier container and maintained at a temperature below 4 °C (39 °F).

3.3 Working Life:

The impregnated cloth shall meet the requirements of 3.4 and 3.5 when tested, after warming to room temperature, at any time up to five days after removal from refrigerated storage.

3.4 Properties of Uncured Product:

The impregnated cloth, as supplied, shall conform to the requirements shown in Table 1; tests shall be performed on the product supplied, sampled in accordance with 4.3.1 after warming to above the dew point, and tested in accordance with specified test methods.

TABLE 1 - Properties of Uncured Product

Paragraph	Property	Requirement	Test Method
3.4.1	Resin Content	36% by weight $\pm$ 3	4.5.2
3.4.2	Resin Flow	12% +4, -3	4.5.3
3.4.3	Tack	Shall obtain tack under slight heating (will adhere to itself)	

3.5 Properties of Cured Laminate:

Shall conform to the requirements shown in Table 2, determined on specimens cut from a test laminate prepared as in 4.5.1. Specimens for elevated temperature tests shall be tested after exposure at the test temperature for 30 minutes $\pm$ 1. For tests No. 1 through 6, property values specified are the minimum average of five determinations per test; no individual value shall be less than 90% of the minimum average value specified.

TABLE 2A - Properties of Cured Laminate, Inch/Pound Units

Test Number	Property	Requirements at 77 °F ± 9	Requirements at 450 °F ± 9	Test Method
1	Tensile Strength, minimum average	60.0 ksi	50.0 ksi	4.5.4
2	Edgewise Compressive Strength, minimum average	50.0 ksi	30.0 ksi	ASTM D 695
3	Edgewise Compressive Modulus, minimum average	3.0 Msi	2.5 Msi	ASTM D 695
4	Flexural Strength, minimum average	70.0 ksi	50.0 ksi	ASTM D 790
5	Flexural Modulus, minimum average	3.0 Msi	2.5 Msi	ASTM D 790
6	Short-Beam Shear Strength, minimum average	6000 psi	3500 psi	4.5.5
7	Dielectric Constant at 9.365 GHz, maximum	3.65	--	ASTM D 150
8	Dielectric Loss Index, at 9.365 GHz, maximum	0.008	--	ASTM D 150
9	Specific Gravity at 73/73 °F	Preproduction Value ± 0.10	--	ASTM D 792
10	Void Content, maximum	5.0%	--	ASTM D 2734, Method A