

(R) Carbon Fiber Fabric Repair Prepreg, 120 °C (250 °F) Vacuum Curing
Part 0 - Introduction

RATIONALE

AMS3970 is revised to include relevant Performance Review Institute (PRI) documentation references and the PRI rules to manage the qualification process through the Qualified Products Group (QPG). The revision also includes the Purchasing Specification for a companion Non-Structural Glass Prepreg and the PRI QPL AMS3970 as part of the Technical Specification System (Figure 1).

FOREWORD

This Technical Specification is prepared by the Air Transport Association/International Air Transport Association/SAE International (ATA/IATA/SAE) Commercial Aircraft Composite Repair Committee - Repair Material Task Group (CACRC-RMTG). The purpose of this specification is to obtain a common technical specification for 120 °C (250 °F) vacuum curing repair prepreg for carbon fiber reinforced epoxy structures conforming to the requirements of the Original Equipment Manufacturers (OEM).

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1. SCOPE

This document (Technical Specification) gives information about qualification rules and the relation between the different specification parts involved, such as the Technical Specification (TS), Material Specification (MS), and Purchasing Specification (PS). The link to the material qualification and qualified products is presented.

1.1 Field of Application

This document is only applicable to epoxy or modified epoxy resin prepreg systems used for repair of carbon fiber composite structures and companion non-structural glass fiber prepreg. Generally, an epoxy or modified epoxy resin film adhesive will be part of the prepreg system for co-cure bonding applications.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS3970/1	Carbon Fiber Fabric Repair Prepreg, 120 °C (250 °F) Vacuum Curing - Part 1 - General Requirements
AMS3970/2	Carbon Fiber Fabric Repair Prepreg, 120 °C (250 °F) Vacuum Curing - Part 2 - Qualification Program for Fiber, Fabric, Carbon Prepreg, Film Adhesive and Non-Structural Glass Prepreg
AMS3970/3	Carbon Fiber Fabric Repair Prepreg, 120 °C (250 °F) Vacuum Curing - Part 3 - Purchasing Specification for Carbon Prepreg
AMS3970/4	Carbon Fiber Fabric Repair Prepreg, 120 °C (250 °F) Vacuum Curing - Part 4 - Purchasing Specification for Film Adhesive
AMS3970/5	Carbon Fiber Fabric Repair Prepreg, 120 °C (250 °F) Vacuum Curing - Part 5 - Purchasing Specification for Companion Non-Structural Glass Fiber Fabric Prepreg
AMS3970/6	Carbon Fiber Fabric Repair Prepreg, 120 °C (250 °F) Vacuum Curing - Part 6 - Carbon Fiber Fabric Reinforced Epoxy Prepreg for Repair, Plain Weave, 193 gm/m ² , Adhesive Film for Repair, Non-Structural Glass Fiber fabric Reinforced Epoxy Prepreg, 105 gm/m ²

2.2 ISO Publications

Available from International Organization for Standardization, 1 rue de Varembe, Case postale 56, CH-1211 Geneva 20, Switzerland, Tel: +41-22-749-01-11, www.iso.org.

ISO 9000	Quality Management Systems - Fundamentals and Vocabulary
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2.3 PRI Publications

Available from Performance Review Institute, 161 Thorn Hill Road, Warrendale PA 15086-7527, Tel: 724-772-1616, www.pri-network.org.

PD 2000 Governance and Administration of an Industry Managed Product Qualification Program

PD 2001 Manufacturer Request for Product Approval and Qualification Process

PRI QPL AMS3970 Qualified Product List of AMS3970

3. MATERIAL QUALIFICATION

3.1 Organizations Involved

CACRC-QPG (Commercial Aircraft Composite Repair Committee-Qualified Product Group) is a mandated body designated by the PRI (Performance Review Institute) Qualified Product Management Council (QPMC) in accordance with PRI PD 2000.

The members of the CACRC QPG are the members of the CACRC RMTG (Repair Materials Task Group).

The CACRC QPG operates in accordance with PD 2000.

Material Manufacturer - The manufacturer that produces the end product to be tested in the qualification program, i.e. the prepreg manufacturer and the adhesive film manufacturer. They shall follow the application process specified in PD 2001.

OEM - Original Equipment Manufacturer, certified by airworthiness authorities.

3.2 Qualification Rules

3.2.1 Organization

Material qualification in accordance with this document (TS), review of qualification results, approval, reapproval, and recertification of qualification for QPL listing shall be in accordance with PD 2000.

Screening and qualification testing is the responsibility of the material manufacturer.

In addition to the qualification program, the Original Equipment Manufacturer (OEM) may require additional design-related testing before the qualified prepreg system can be approved for repair of carbon fiber composite structures. This additional testing is the responsibility of the material manufacturer unless otherwise agreed with the OEM involved.

3.2.2 Technical

In accordance with the requirements of this TS the qualification rules are:

- a. The prepreg (including fiber, woven fabric, and impregnated resin) shall be qualified as a unique composite material.
- b. After successful qualification the composite prepreg material shall be listed in the PRI QPL AMS3970. The companion non-structural glass fiber prepreg and the film adhesive if required, shall also be listed in the PRI QPL AMS3970, when successfully qualified.
- c. Any other prepreg fabric system (that include combinations of fiber, fabric, and impregnated resin) not mentioned in the PRI QPL AMS3970 are not qualified.

For qualification, four important items shall be completed:

- a. Audit of supplier in accordance with ISO 9000 or equivalent
- b. Reporting of the material manufacturing process (Process Control Document)
- c. Testing of the material performance (qualification program)
- d. Specifying production quality control and batch release requirements

4. FORMAT OF THE DOCUMENT

The Technical Specification (TS) system is illustrated in Figure 1 and consists of the following:

4.1 Technical Specification

- a. The TS specifies all requirements for screening and qualification for base materials and the prepreg system.
- b. AMS3970 - Introduction - gives an explanation about the aim of this TS system, the relationship between the specification parts involved and qualified products.
- c. AMS3970/1 - General Requirements - Specifies the general requirements. It gives the requirements and test methods for qualification of a fiber, fabric, and prepreg system. It also gives the requirements and test methods for qualification of the companion non-structural glass fiber prepreg and the adhesive film.
- d. AMS3970/2 - Qualification Program - Specifies the qualification program for the base materials the prepreg system, the companion non-structural glass fiber prepreg and the adhesive film.

Purchasing Specifications (PS) are part of the TS and give specific information about the batch release and delivery requirements for the prepreg system and film adhesive (if required).

- a. AMS3970/3 - Purchasing Specification for Carbon Prepreg - Specifies the requirements for the prepreg system.
- b. AMS3970/4 - Purchasing Specification for Film Adhesive - Specifies the requirements for the film adhesive, if required.
- c. AMS3970/5 - Purchasing Specification for Non-Structural Glass Prepreg - Specifies the requirements for the companion non-structural glass fiber prepreg.

4.2 Material Specification

AMS3970/6 - The MS gives the prepreg material requirements with regard to the properties of the base materials as well as the carbon repair prepreg, the companion non-structural glass fiber prepreg and the film adhesive, if required for screening and qualification.

4.3 PRI QPL AMS3970

The PRI QPL AMS3970 lists the qualified material prepreg system, the companion non-structural glass fiber prepreg and film adhesive system. A prepreg system, both the carbon repair prepreg and the companion non-structural glass fiber prepreg originates from one prepreg manufacturer. A film adhesive system originates from one adhesive manufacturer