



AEROSPACE MATERIAL SPECIFICATION	AMS2980™/2	REV. B
	Issued 1996-11 Revised 2014-04 Reaffirmed 2021-09 Superseding AMS2980/2A	
(R) Carbon Fiber Fabric and Epoxy Resin Wet Lay-up Repair Material Part 2 - Qualification Program		

RATIONALE

AMS2980/2B is a Five Year Review and update of this specification.

FOREWORD

AMS2980/2 is part of the Technical Specification (TS) system described in AMS2980.

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1. SCOPE

AMS2980/2 gives specific information about the qualification program for carbon fiber fabric, epoxy systems and the material combination used for wet lay-up repair of carbon fiber reinforced epoxy structures.

1.1 Field of Application

This TS is only applicable to carbon fiber fabric materials and epoxy laminating resins.

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.

AMS2980 Carbon Fiber Fabric and Epoxy Resin Wet Lay-Up Repair Material Part 0 – Introduction

AMS2980/1 Carbon Fiber Fabric and Epoxy Resin Wet Lay-Up Repair Material Part 1 - General Requirements

2.2 PRI Publications

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

PRI QPL AMS2980 Qualified Product List of AMS2980.

2.3 Other Publications

See the applicable Documents Section of AMS2980/1 for reference to all other documents listed in this part specification.

3. DEFINITIONS

Refer to AMS2980/1.

4. REQUIREMENTS

Refer to AMS2980/1 and the relevant MS. The number of specimens per test condition is specified in Table 15. Refer to Table 14 for abbreviations used.

5. QUALIFICATION

Refer to AMS2980/1. The qualification program is given in:

Table 1: Material Qualification Program for Carbon Fiber

Table 2: Material Qualification Program for Carbon Fabric

Table 3 through Table 5: Material Qualification Program for Epoxy Resin System

Table 6: Material Shelf Life Extension Testing

Table 7 through Table 14: Material Qualification Program for Composite Material

TABLE 1 - MATERIAL QUALIFICATION PROGRAM FOR CARBON FIBER

id	Property	Number of Batches ¹⁾	Test Method
1.1	Tensile Impregnated Yarn (Fiber Strength, Modulus & Strain)	-	ISO 10618.2/B ²⁾
1.2	Fiber Density	-	ISO 10119/A
1.3	Filament Count	-	According to Manufacturer
1.4	Sizing Content	-	ISO 10548/C
1.5	Mass per Unit Length (Linear Density)	-	ISO 1889
1.6	Twist	-	ISO 1890
1.7	Filament Diameter	-	According to Manufacturer
1) No qualification tests are required. The fiber shall be a qualified material in a prepreg used by an OEM, reference AMS2980/1. Substantiating qualification data shall be provided. 2) Normalize to 100% fiber volume.			

TABLE 2 - MATERIAL QUALIFICATION PROGRAM FOR CARBON FABRIC

id	Property	Number of Batches ^{1) 2)}
2.1	Weaving Style and Yarn Count	-
2.2	Fabric Areal Mass	-
1) No qualification tests are required. Data from batches used in the qualification program shall be provided by the fabric manufacturer. 2) Test methods per AMS2980/1.		

TABLE 3 - MATERIAL QUALIFICATION PROGRAM FOR UNMIXED RESIN AND CURING AGENT

id	Property ¹⁾	Number of Batches				Test Method ²⁾
		Base Resin		Curing Agent		
		Nom Water Content	Max Water Content	Nom Water Content	Max Water Content	
3.1	Epoxide Equivalent	q3	-	-	-	ASTM D 1652 or ISO 3001
3.2	Amine Value	-	-	q3	q1	ASTM D 2896
3.3	IR (Qualitatively)	q3	-	q3	-	EN 6042 or ASTM E 1252
3.4	Water Content	q3	q1	q3	q1	ASTM E 203 or ISO 760
3.5	Viscosity at 25 °C	q3,s	q1	q3,s	q1	ISO 2555
3.6	Density	q1	-	q1	-	ISO 1183 Part 1 or ASTM D1875
1) Reference Table 16 for nomenclature. 2) Method for id 3.1, 3.2, and 3.5 to be agreed to between resin manufacturer and CACRC-QPG. The method shall be specified in the relevant Appendix of PRI QPL AMS2980.						

TABLE 4 - MATERIAL QUALIFICATION PROGRAM FOR MIXED UNCURED RESIN

id	Property ¹⁾	Number of Batches				Test Method ²⁾
		Nominal Water Content			Max Water Content	
		Nom Mixing Ratio	Max Mixing Ratio	Min Mixing Ratio	Min Mixing Ratio	
4.1	Viscosity at 25 °C	q3,s	q1	-	-	ISO 2555
4.2	Viscosity Profile ³⁾	q3,s	-	q3	q1	EN 6043 or ASTM D 4440
4.3	Viscosity Profile ⁴⁾	q3	-	-	-	EN 6043 or ASTM D 4440
4.4	Gel Time at 25 °C	q3	-	-	-	ASTM D 2471
4.5	DSC	q3				EN 6041 or ISO11357-5 (10 °C/min)
1) Reference Table 16 for nomenclature. 2) Method for id 4.1 and 4.2 to be agreed to between resin manufacturer and CACRC-QPG. The method shall be specified in the relevant Appendix of PRI QPL AMS2980. 3) With nominal cure cycle as specified for composite panel fabrication. 4) Dynamic at 2 °C/min.						