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NCAMP Material Specification

Vacuum-Bag-Only or Autoclave Cure Epoxy Prepregs
Type 38, Class 3, Form 4, Grade 293, Style 8HS 7781

Park Aerospace Corp. E765 7781 Glass

*This specification is generated and maintained in accordance with NCAMP
Standard Operating Procedures, NSP 100*

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Distribution Statement A. Approved for public release; distribution is unlimited.

REVISIONS

Rev	By	Date	Description
-	Vinsensius Tanoto	3/10/2025	Initial Release

1. SCOPE:**1.1 Form:**

This detail specification along with the base material specification NMS 765 establishes the requirements for carbon fiber fabric impregnated with a modified B-staged epoxy resin ("fabric prepreg"). The prepreg is produced using a solution treater process.

This detail specification follows the section and table numbering scheme of the base specification. It contains additional or superseding requirements. The base specification shall govern where no additional requirement is specified; in such cases, the applicable sections are omitted from this detail specification.

NCAMP material specification, NMS 765 is written based on Park Aerospace Corporation E-765 MS1000 Rev 7, 6/20/13 and MS1001 Rev 5, 3/23/2015 material specifications for E-765 materials in AGATE database. NMS 765/5 shall be used for future procurements.

AGATE-WP3.3-033051-105 B – Basis Design Allowables for Epoxy – Based Prepreg
FiberCote E-Glass Fabric 7781 / E765

1.3 Classification: All products qualified to this detail specification have the following classification: Type 38, Class 3, Grade 293, Style 7781

3. TECHNICAL REQUIREMENTS:

Table 1 – Prepreg Physical and Chemical Properties

Property	Test Method ⁽¹⁾	Number of Replicates	Requirements ⁽⁵⁾
Resin Content	ASTM D2584	Every roll ⁽²⁾	38±3% ind 38±3% avg
Fiber Areal Weight	ASTM D3776	Every roll ⁽²⁾	293±18 gsm ind 293±18 gsm avg
Volatile Content ⁽⁶⁾	ASTM D3530	First and last rolls of every batch ⁽²⁾	1.5% max, avg
Flow ⁽⁷⁾	ASTM D3531	First and last rolls of every batch ⁽²⁾	10 to 32 % wt
Gel Time ⁽⁸⁾	ASTM D3532	First and last rolls of every batch ⁽²⁾	100 to 400 seconds
Tack	See 4.6.1	First and last rolls of every batch	Level IV
Drape	See 4.6.2	First and last rolls of every batch	Pass
HPLC ⁽³⁾	SACMA SRM 20R-94 or ASTM E682	First and last rolls of every batch	PCD
FTIR ⁽³⁾⁽⁴⁾	ASTM E168	First and last rolls of every batch	PCD
Differential Scanning Calorimetry (DSC) ⁽⁹⁾ Onset Temperature Peak Temperature	SACMA SRM 25R-94 or ASTM D3418	First and last rolls of every batch ⁽¹⁰⁾	140 to 165°C 160 to 170°C

(1) Specific procedures should be identical to those used in the original material qualification program.

(2) Three specimens should be taken across the width of the prepreg; left, center, right.

(3) Not required for receiving inspection test.

(4) Optional for batch release test.

(5) “ind.” refers to individual measurements. “avg” refers to the average of measurements per roll.

(6) Tested at 270-275°F for 8±1 min, 4 x 4 inch specimen.

(7) Tested at 270-275°F at 50±5 psi for 8±1 min, 4 x 4 inch specimen.

(8) Tested at 270-275°F.

(9) Limits computed using ± 3 sigma.

(10) One sample.

3.2 Constituent Material Requirements:

3.2.2 Reinforcement: Specific glass fiber yarn producer and production location is controlled by the prepreg process control document (PCD) and NRP 101. The fabric shall meet the requirements in the table below. In addition, the fabric weaver and weaving location is

controlled through prepreg PCD and NRP 101. This product does not contain tracer yarn. Tracer yarn may be included only if it is specifically requested by the purchaser. The inclusion of tracer yarn might alter the material properties.

Property	Requirements
Specification	AMS-C-9084 Type VIII B, Class 2 (BGF Industries 7781)
Fabric Thickness	0.009 inch (Nominal)
Fabric Yarn Count/inch, warp x fill	57 x 54±2
Fabric Areal Weight	293 ± 18 g/m ²

3.5 Laminate (Cured Prepreg) Requirements:

3.5.2 Cured Laminate Physical Properties:

TABLE 3 - Cured Laminate Physical Properties

Property	Test Method ⁽¹⁾	Requirements ⁽²⁾
Cured Ply Thickness	SACMA SRM 10R-94 or ASTM D3171	0.0090 to 0.0106 inch, avg
Dry Glass Transition Temperature, Onset Modulus Tg (log scale) by DMA ⁽⁴⁾	by flexural loading per SACMA SRM 18R-94	148 to 184 °C, ind

- ⁽¹⁾ Specific procedures should be identical to those used in the original material qualification program
- ⁽²⁾ "ind" refers to individual measurements. "avg" refers to the average measurements per panel.
- ⁽⁴⁾ Limits computed from average qualification data ± 18 °F.

3.5.3 Cured Laminate Mechanical Properties:

TABLE 4 - Required Cured Laminate Tests for Mechanical Properties (Class 3)

Property	Test Method ⁽¹⁾	Requirements
90° (fill) Tension Strength and Modulus Room Temperature Ambient Layup: [90] ₁₂	ASTM D3039	Strength ⁽²⁾⁽³⁾ : Min. Ind. ≥ 40.61 ksi Strength ⁽²⁾⁽³⁾ : Average ≥ 48.24 ksi Modulus ⁽²⁾⁽³⁾ : 3.0 and 4.0 msi, avg
90° (fill) Compression Strength, Room Temperature Ambient Tabbed Layup: [90] ₁₄	SACMA SRM 1-94	Strength ⁽²⁾⁽³⁾ : Min. Ind. ≥ 46.20 ksi Strength ⁽²⁾⁽³⁾ : Average ≥ 53.97 ksi
90° (fill) Compression Modulus, Room Temperature Ambient Layup: [90] ₁₄	SACMA SRM 1-94	Modulus ⁽²⁾⁽³⁾ : 3.2 and 4.1 msi, avg
0° (warp) Short Beam Strength, Room Temperature Ambient Layup: [0] ₁₂	ASTM D2344 ⁽⁴⁾	Strength ⁽⁴⁾ : Min. Ind. ≥ 5.69 ksi Strength ⁽⁴⁾ : Average ≥ 7.00 ksi

⁽¹⁾ Specific procedures should be identical to those used in the original material qualification program.

⁽²⁾ Normalize the properties to a cured ply thickness value of 0.0098 inch based on actual qualification panel thicknesses.

⁽³⁾ "ind." refers to individual measurements. "avg" refers to the average of 5 replicates. Limits computed at α=0.01 and modified CV.

⁽⁴⁾ "ind." refers to individual measurements. "avg" refers to the average of 5 replicates. Limits computed using Qualification and historical batch release data at α=0.01 and modified CV. 0.25 x 7T (0°) inch, Span length: 5T.

QUALIFIED PRODUCTS LIST

Supplier Product Designation	Supplier Name and Production Location	Date Qualified	Specification Callout ⁽¹⁾
Park Aerospace Corp. E765 7781 Glass	Supplier Name: Park Aerospace Corp. Production Location: 486 N. Oliver Road Newton, KS 67212 Approved Line: AJ	Sept 2001	NMS 765/5 Classification callout is optional because Type 38, Class 3, Grade 293, Style 7781 is the only classification allowed in this QPL.

⁽¹⁾ In accordance with NCAMP Standard Operating Procedures, NSP 100, this QPL shall not contain alternate materials/products. Additional production location may be included in the QPL only after successful equivalency demonstration and approval per NCAMP Prepreg Process Control Document (PCD) Preparation and Maintenance Guide, NRP 101.

The proper specification callout for material procurement purpose is “NMS 765/5.” This specification is developed based on the material properties that are available publicly. The purchaser may specify additional requirements beyond those specified in this specification, especially when the purchaser has generated additional material properties beyond those available publicly or when the application requires additional requirements. The additional requirements are subject to supplier review and approval.