



AEROSPACE MATERIAL SPECIFICATION

AMS6885™/1

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Unidirectional Carbon Fiber Tape Epoxy Repair Prepreg, Vacuum Curing Part 1 - General Requirements

RATIONALE

Provide a unidirectional carbon fiber tape epoxy repair prepreg capable of curing under vacuum for repair of carbon fiber reinforced epoxy structures. The repair system includes a film adhesive to be applied in a co-bonding process with the prepreg for solid laminate and sandwich bonding. AMS6885/1 defines the qualification process and test methods.

AMS6885/1 has been reaffirmed to comply with the SAE Five-Year Review policy.

A reaffirmed status is given to technical reports that have been reviewed by the technical committee and deemed to be current with no need for immediate revision. No changes have been made to this document as a result of this review.

FOREWORD

AMS6885/1 belongs to the Technical Specification (TS) system explained in AMS6885.

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1. SCOPE

AMS6885/1 gives information about the technical requirements and qualification procedure for unidirectional carbon fiber tape epoxy repair prepreg capable of curing under vacuum for repair of carbon fiber reinforced epoxy structures. The repair system includes an epoxy film adhesive to be applied in a co-bonding process with the prepreg for solid laminate and sandwich bonding.

1.1 Classification

1.1.1 Grades

Grades identify the nominal fiber mass per unit area of the unidirectional carbon fiber tape epoxy repair prepreg as follows:

Grade 134: 134 g/m² (3.95 oz/yd²)

Grade 194: 194 g/m² (5.72 oz/yd²)

And the nominal mass per unit area of the film adhesive as follows:

Grade 300: 300 g/m² (8.85 oz/yd²)

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 +1 724-776-4970 (outside USA), www.sae.org.

AMS1428	Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
AMS6885	Unidirectional Carbon Fiber Tape Epoxy Repair Prepreg, Vacuum Curing, Part 0 - Introduction
AMS6885/2	Unidirectional Carbon Fiber Tape Epoxy Repair Prepreg, Vacuum Curing, Part 2 - Qualification Program for Fiber, Carbon Fiber Tape Prepreg, and Film Adhesive
AMS6885/3	Unidirectional Carbon Fiber Tape Epoxy Repair Prepreg, Vacuum Curing, Part 3 - Purchasing Specification for Unidirectional Carbon Fiber Tape Epoxy Repair Prepreg
AMS6885/4	Unidirectional Carbon Fiber Tape Epoxy Repair Prepreg, Vacuum Curing, Part 4 - Purchasing Specification for Film Adhesive
AMS6885/5	Unidirectional Carbon Fiber Tape Epoxy Repair Prepreg, Vacuum Curing, Part 5 - Material Specification for Unidirectional Carbon Fiber Tape Epoxy Prepreg for Repair and Film Adhesive for Repair, 120 to 145 °C (250 to 290 °F) Curing
AIR4844	Composites and Metal Bonding Glossary

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM C297/C297M	Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
ASTM D792	Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D1002	Standard Test Method for Apparent Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)
ASTM D1655	Standard Specification for Aviation Turbine Fuels
ASTM D2344/D2344M	Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
ASTM D3039/D3039M	Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
ASTM D3171	Standard Test Method for Constituent Content of Composite Materials
ASTM D3518/D3518M	Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a $\pm 45^\circ$ Laminate
ASTM D3529/D3529M	Standard Test Method for Constituent Content of Composite Prepreg
ASTM D3530/D3530M	Standard Test Method for Volatiles Content of Composite Material Prepreg
ASTM D4440	Standard Practice for Rheological Measurement of Polymer Melts Using Dynamic Mechanical Procedures
ASTM D5229/D5229M	Standard Test Method for Moisture Absorption Properties and Equilibrium Conditioning of Polymer Matrix Composite Materials
ASTM D5528	Standard Test Method for Mode I Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites
ASTM D5656	Standard Test Method for Thick-Adherend Metal Lap-Shear Joints for Determination of Stress-Strain Behavior of Adhesives in Shear by Tension Loading
ASTM D5766/D5766M	Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates
ASTM D6484/D6484M	Standard Test Method for Open Hole Compressive Strength of Polymer Matrix Composite Laminates
ASTM D7136/D7136M	Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event
ASTM D7137/D7137M	Standard Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates
ASTM D7249/D7249M	Standard Test Method for Facing Properties of Sandwich Constructions by Long Beam Flexure
ASTM D7905/D7905M	Standard Test Method for Determination of the Mode II Interlaminar Fracture Toughness of Unidirectional Fiber-Reinforced Polymer Matrix Composites
ASTM D8066/D8066M	Standard Practice Unnotched Compression Testing of Polymer Matrix Composite Laminates

ASTM D8131/D8131M	Standard Practice for Tensile Properties of Tapered and Stepped Joints of Polymer Matrix Composite Laminates
ASTM E4	Standard Practices for Force Verification of Testing Machines
ASTM E228	Standard Test Method for Linear Thermal Expansion of Solid Materials with a Push-Rod Dilatometer
ASTM E573	Standard Practices for Internal Reflection Spectroscopy
ASTM E831	Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis
ASTM E1252	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis
ASTM E1640	Standard Test Method for Assignment of the Glass Transition Temperature by Dynamic Mechanical Analysis
ASTM E2160	Standard Test Method for Heat of Reaction of Thermally Reactive Materials by Differential Scanning Calorimetry

2.3 EN Publications

Available from CEN—Comité Européen de Normalisation (European Committee for Standardization), Central Secretariat, Rue de Stassart 36, B-1050 Brussels, Belgium, www.cenorm.be; and from ASD-STAN—Aerospace and Defence Industries Association of Europe-Standardization, Rue Montoyer 10, 5th floor, B-1000 Brussels, Belgium, <http://www.asd-stan.org>.

ASD-STAN prEN 3003	Aerospace Series - Structural Adhesives - Determination of Mass per Unit Area of Film Adhesives - Test Method
ASD-STAN prEN 3615	Aerospace Series - Fiber Reinforced Plastics - Determination of the Conditions of Exposure to Humid Atmosphere and of Moisture Absorption
ASD-STAN prEN 6042	Aerospace Series - Organic Compounds - Test Method - Analysis by Infrared Spectroscopy
ASD-STAN prEN 6043	Aerospace Series - Thermosetting Resin Systems - Test Method - Determination of Gel Time and Viscosity
ASD-STAN prEN 6060	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of the Tensile Single Lap Shear Strength
ASD-STAN prEN 6061	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of Sandwich Flexural Strength 4 Point Bending
ASD-STAN prEN 6062	Aerospace Series - Fiber Reinforced Plastics - Test Method - Flatwise Tensile Test of Composite Sandwich Panel
ASD-STAN prEN 6066	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of Tensile Strength of a Tapered and Stepped Joints
EN 2243-1	Aerospace Series - Non-Metallic Materials - Structural Adhesives - Test Method - Part 1: Single Lap Shear
EN 2379	Aerospace Series - Fluids for Assessment of Non-Metallic Materials
EN 2489	Aerospace Series - Fiber Reinforced Plastics - Determination of the Action of Test Fluids
EN 2557	Aerospace Series - Carbon Fiber Preimpregnates - Determination of Mass per Unit Area

EN 2558	Aerospace Series - Carbon Fiber Preimpregnates - Determination of the Volatile Content
EN 2559	Aerospace Series - Carbon Fiber Preimpregnates - Determination of the Resin and Fiber Content and the Mass of Fiber per Unit Area
EN 2561	Aerospace Series - Carbon Fiber Reinforced Plastics - Unidirectional Laminates - Tensile Test Parallel to the Fiber Direction
EN 2563	Aerospace Series - Carbon Fiber Reinforced Plastics - Unidirectional Laminates - Determination of Apparent Interlaminar Shear Strength
EN 2564	Aerospace Series - Carbon Fiber Laminates - Determination of the Fiber, Resin and Void Contents
EN 2565	Aerospace Series - Preparation of Carbon Fiber Reinforced Resin Panels for Test Purposes
EN 2597	Aerospace Series - Carbon Fiber Reinforced Plastics - Unidirectional Laminates - Tensile Test Perpendicular to the Fiber Direction
EN 2823	Aerospace Series - Fiber Reinforced Plastics - Determination of the Effect of Exposure to Humid Atmospheres on Physical and Mechanical Characteristics
EN 2850	Aerospace Series - Carbon Fiber Thermosetting Resin - Unidirectional Laminates - Compression Test Parallel to Fiber Direction
EN 6031	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of In-Plane Shear Properties ($\pm 45^\circ$ Tensile Test)
EN 6032	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of Glass Transition Temperatures
EN 6033	Aerospace Series - Carbon Fiber Reinforced Plastics - Test Method - Determination of the Interlaminar Fracture Toughness Energy - Mode I - GIC
EN 6034	Aerospace Series - Carbon Fiber Reinforced Plastics - Test Method - Determination of the Interlaminar Fracture Toughness Energy - Mode II - GIIC
EN 6035	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of Notched and Unnotched Tensile Strength
EN 6036	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of Notched, Unnotched and Filled Hole Compression Strength
EN 6038	Aerospace Series - Fiber Reinforced Plastics - Test Method - Determination of Compression Strength After Impact
EN 6040	Aerospace Series - Non-Metallic Materials - Test Method - Analysis of Thermoset Systems by High Performance Liquid Chromatography (HPLC)
EN 6041	Aerospace Series - Non-Metallic Materials - Test Method - Analysis of Non-Metallic Materials (Uncured) by Differential Scanning Calorimetry (DSC)

2.4 ISO Publications

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

ISO 472	Plastics - Vocabulary
ISO 1183-1	Plastics - Methods for Determining the Density of Non-Cellular Plastics - Part 1: Immersion Method, Liquid Pyknometer Method and Titration Method
ISO 1889	Reinforcement Yarns - Determination of Linear Density
ISO 9000	Quality Management Systems - Fundamentals and Vocabulary
ISO 10119	Carbon Fiber - Determination of Density
ISO 10352	Fiber-Reinforced Plastics - Moulding Compounds and Prepregs - Determination of Mass per Unit Area
ISO 10548	Carbon Fiber - Determination of Size Content
ISO 10618	Carbon Fiber - Determination of Tensile Properties by Resin Impregnated Yarn
ISO 11357-5	Plastics - Differential Scanning Calorimetry (DSC) - Part 5: Determination of Characteristic Reaction-Curve Temperatures and Times, Enthalpy of Reaction and Degree of Conversion
ISO 14644-1	Cleanrooms and Associated Controlled Environments - Part 1: Classification of Air Cleanliness by Particle Concentration
ISO 25217	Adhesives - Determination of the Mode I Adhesive Fracture Energy of Structural Adhesive Joints Using Double Cantilever Beam and Tapered Double Cantilever Beam Specimens

2.5 SACMA Publications

Available from American Composites Manufacturers Association, 1010 North Glebe Road, Suite 450, Arlington, VA 22201, www.acmaeducationhub.org/products/1046/sacma-recommended-methods-srm-manual-cd.

SACMA SRM 1R-94	Compression Properties of Oriented Fiber-Resin Composites, Issued 1994
SACMA SRM 20R-94	High Performance Liquid Chromatography of Thermoset Resins, Issued 1994

2.6 Military Specifications

MIL-DTL-83133G	Turbine Fuels, Aviation, Kerosene Types, JP-8 (NATO F-34) and NATO F-35 and JP-8+100 (NATO F-37)
MIL-L-23699	Military Specification Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Numbers: O-152, O-154, O-156, and O-167
MIL-PRF-83282D	Performance Specification - Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, Nato Code Number H-537

2.7 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-AMS6885 Performance Review Institute - Qualified Products List of AMS6885

Individual Product Sheets (IPS) of Qualified Products, Appendix to PRI-QPL-AMS6885

2.8 Definitions

2.8.1 General

For the purpose of this specification, the definitions in ISO 472 apply with the following additions or modifications. For further definitions or explanations of terms, refer to AIR4844.

CONTINUOUS MATERIAL MANUFACTURING OPERATION: A continuous material manufacturing operation is defined as one in which the process is not interrupted for more than 72 continuous hours, during which time the materials shall be stored according to the certified production procedure. Any interruption shall not contain a different product run. The total production time, interruptions included, shall not exceed 5 days (this limit does not apply to the manufacture of carbon fiber batches), unless otherwise stated in the relevant Individual Product Sheet (IPS).

PROCESS CONTROL DOCUMENT (PCD): Document defining the material and its manufacturing process. The PCD shall include description of raw materials, equipment, procedures, processes, and manufacturing standards.

REPAIR SYSTEM: The carbon fiber tape prepreg material and the associated co-bonding film adhesive are defined as the repair system.

REPLICA: Production of a defined material of an original source on another production line and/or different site using the same raw materials and processes as the original source.

SIZING: An organic coating applied during fiber manufacture to improve handling properties during tape manufacture and fabric weaving.

STORAGE LIFE: Period of time from manufacturing date (if not otherwise specified in the relevant Individual Product Sheet) during which the material, when stored under specified storage conditions, retains all of its physical, chemical, and mechanical properties, complies with the requirements of this TS, the relevant MS, and the relevant IPS, and is covered by the manufacturer's guarantee. See [Figure 1](#).

WORK LIFE: The continuous or accumulated period of time between first take out of the material of the -18 °C cold storage and curing. Maximum period of time under the work conditions specified in this TS, the relevant MS and the relevant IPS, during which the material remains in a usable condition and continues to comply with the requirements of this TS, the relevant MS and the relevant IPS. Work life is also referred to as mechanical life. See [Figure 1](#).

STAND BY TIME: Period of time between completion of bagging and start of cure. The standby time is part of the work life. See [Figure 1](#).

TACK LIFE: Period of time during which the individual layers stick together when laminated without the use of heat and adhere to the repair surface under the work conditions specified in this TS, the relevant MS and the relevant IPS. The tack life is part of the work life. Tack life is also referred to as handling life. See [Figure 1](#).

THAWING TIME: Period of time for the material taken out of cold storage necessary to reach equilibrium with room temperature before the approved storage bag can be opened. The thawing time shall always be long enough to avoid any condensation on the material after opening the bag. See [Figure 1](#).

2.8.2 Specific for Resin

RESIN: Thermosetting epoxy resin, capable of being cured at an elevated temperature and suitable for use in the manufacture of prepreg and adhesive.

RESIN BATCH: A quantity of homogeneous resin prepared in one operation with traceability to individual component batches as described in the PCD of the prepreg and adhesive manufacturer used to manufacture prepreg or film adhesive in accordance with the defined process. A resin batch may contain up to 15% of another approved and within shelf-life resin batch of the same resin type, blended uniformly with the major resin batch. Full traceability shall be maintained for all raw material constituents.

2.8.3 Specific for Film Adhesive

FILM ADHESIVE: Semi finished product of specified mass per unit area produced from thermosetting resin in an uncured state of certain advancement, ready to be applied in bondlines for co-bonding with a prepreg. A suitable carrier material (fabric or scrim) shall be incorporated into the film adhesive to improve handleability and to define minimum bondline thickness.

FILM ADHESIVE BATCH: A film adhesive batch is produced in one continuous manufacturing operation using one batch of resin and suitable carrier with traceability to the individual batches of resin and carrier used.

ADHESIVE ROLL: Adhesive material including suitable backing protection contained on one support tube.

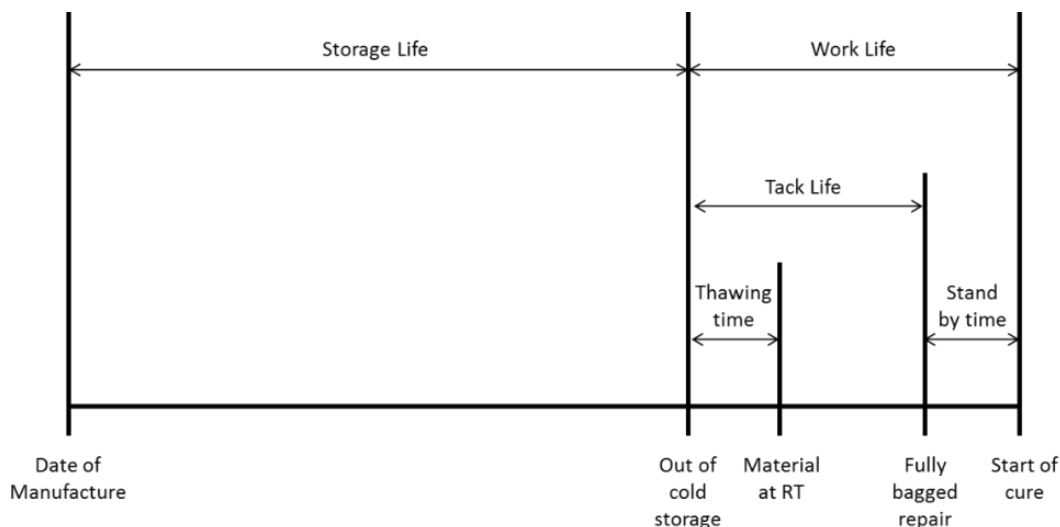


Figure 1 - Definition of storage life and work life

2.8.4 Specific for Carbon Fiber Prepreg

FIBER BATCH: A fiber batch is a quantity of fibers, manufactured in one continuous operation and uniform production conditions.

TAPE PREPREG: Unidirectional fiber material impregnated with a specified amount of thermosetting resin in an uncured state of certain advancement ready for lamination and to be cured by heat and vacuum pressure only.

TAPE PREPREG BATCH: A batch of preimpregnated tape is produced in one continuous manufacturing operation using one batch of resin film and not more than three batches of carbon fiber all from the same supplier with traceability to the resin film batch and the individual batches of fiber used. For film impregnation, it is permissible for each batch of prepreg to contain two different batches of resin, one on each side of the prepreg, provided there is no change within the prepreg batch.

TAPE PREPREG ROLL: Tape prepreg material including suitable backing protection contained on one support tube.

3. REQUIREMENTS

3.1 General Requirements

3.1.1 Qualification

All products qualified to this specification shall be listed on the qualified products list PRI-QPL-AMS6885. The qualified products list shall be in accordance with PD 2000.

3.1.2 Process Control Document (PCD)

Prior to manufacturing the first qualification fiber, resin, tape prepreg and film adhesive batches, the manufacturer shall have established the PCD. The PCD shall be presented to the CACRC-QPG upon request. The PCD shall be approved by the CACRC-QPG upon qualification completion. The CACRC-QPG shall treat any information contained in the PCD as confidential.

Changes to the PCD of a qualified material are subject to the written approval of the CACRC-QPG in accordance with PD 2000. Such changes may require a side qualification program.

3.1.3 Traceability

Each individual material shall be identifiable at all stages of manufacture and delivery. The material manufacturer shall present evidence of the material traceability upon request.

3.1.4 Health and Safety Requirements

The material manufacturer shall provide to the CACRC-QPG all the information about the material in accordance with health and safety requirements prior to testing the materials for screening or qualification.

The delivered prepreg and adhesive system shall fulfill the local requirements of the health and safety laws of the country of the purchaser.

In processing the materials in the composite shop, the prepreg and film adhesive shall not cause any health problems or cause an emission which requires special measures to be taken to protect the environment.

The manufacturer shall inform the purchaser about the safe handling procedures of the material.

The manufacturer shall also provide a safety data sheet appropriate to the country of purchase/use.

3.1.5 Manufacturer's Responsibility

The manufacturer is responsible for the development and manufacture of any material submitted in accordance with this TS. Quality control by the manufacturer shall be in accordance with this TS. The material manufacturer commits to supply the qualified material for a minimum of 10 years from the date of qualification (initial or change).

Adjustment of manufacturing techniques and/or procedures to the state of the art technology is the manufacturer's responsibility and may require requalification to this specification.

3.1.6 Quality Assurance

The manufacturer's quality system shall be approved as defined in ISO 9000 or equivalent.

3.2 Technical Requirements

3.2.1 Technical Requirements for Resin

The resin used to manufacture the prepreg shall be an epoxy or modified epoxy type produced in accordance with this TS and meeting the requirements of the relevant MS. The prepreg and film adhesive do not need to use the same epoxy system but must be compatible.

3.2.2 Technical Requirements for Carbon Fiber

3.2.2.1 Fiber

The carbon fiber used shall be defined by the fiber type, the filament count, the sizing, and the pre-treatment.

3.2.2.2 Pretreatment and Sizing

The PCD shall specify appropriate control of fiber pretreatment and sizing chemistry. The sizing when applied shall meet the requirements of the relevant MS. After qualification the size type and content shall be defined in the Qualification Test Report.

3.2.2.3 Fiber Splices

The fiber yarn on each bobbin shall contain no more than seven splices per kilogram of yarn.

3.2.3 Technical Requirements for Carbon Fiber Tape Prepreg

3.2.3.1 Carbon Fiber Tape Prepreg Requirements

Carbon fiber tape prepreg shall be produced from fiber and resin meeting the requirements of [3.2.1](#) and [3.2.2](#), respectively. The prepreg shall meet the requirements of the relevant MS when tested in accordance with AMS6885/2.

The material shall be uniform in quality and condition and shall not exhibit characteristics detrimental to handling, lay-up, or mechanical properties.

Each roll and kit in the carbon fiber tape prepreg batch shall meet the length and width requirements of AMS6885/3. The specific tolerances on the prepreg rolls and kits width and length are also defined in AMS6885/3. Fibers shall be flush with the edge of the release film or paper.

Materials shall be packaged and shipped in accordance with requirements defined in AMS6885/3.

3.2.3.2 Defects

Any defects in excess of that defined shall be cause for rejection of the specific material delivery or roll, according to the following requirements:

- a. Defect description terms are listed in [Table 1](#).
- b. A defective area is the length of the defect, if that defect exceeds specified limits, multiplied by the roll width.
- c. Defective areas (including an allowance of 1.5 m either side of the defective area) are not part of the delivered quantity and shall not be included in the cost of the material. The purchaser shall not be charged for any defective area. In addition, credit shall be given to the purchaser by the manufacturer for any manufacturing defect of the delivered material discovered during use that had not been previously identified and credited.
- d. The cumulative defective area in a roll shall not exceed 10% of the roll area.
- e. The quantity of defects shall not exceed more than one per 100 m as an average per roll with a minimum distance between defects of 35 m.
- f. All defects within a length of 1 m are counted as one defective area.

Kits will be free of defects when the length is ≤ 10 m. When kits are more than 10 m in length tape roll requirements will apply.

3.2.3.3 Defect Recording and Marking

Except otherwise agreed between the manufacturer and the CACRC-QPG and specified in the Individual Product Sheet (IPS) of the Qualified Product, defects shall be marked as follows:

- a. Each defect shall be identified and flagged with a colored mark positioned at the edge of the tape.
- b. A continuous defect shall be identified with a colored mark at the start and with a different colored mark at the end of the defect.
- c. Rolls with defects shall be marked with red stickers and rolls without faults with green stickers.

Each roll shall have a defect record attached, which must include the following information:

- a. Sequential number of defects.
- b. Type of defect.
- c. The start and end of each defective area in meters, measured from the beginning of the prepreg when it is unrolled, unless otherwise agreed between supplier and purchaser.

Defects not recorded by the manufacturer and detected by the user during application of the material shall be handled similar to recorded defects.

3.2.3.4 Defect Criteria

The items in [Table 1](#) are considered as defects. They will be taken into account for material length calculation and for reporting according to [3.2.3.2](#) and [3.2.3.3](#), respectively.

Table 1 - Defect description and criteria for carbon fiber tape prepreg

Defect	Defect Description	Criteria ⁽¹⁾
Contamination or foreign materials	Any foreign object or dust or dirty yarn present on the prepreg.	None allowed.
Cracks or cuts	Partial or full separation of the material.	None allowed.
Creases or wrinkles	A break, line, or mark in the tape, generally caused by a sharp fold.	None allowed if the crease/wrinkle remains when unwinding the tape.
Crimped fibers	A fiber that folds in the direction of the fiber tow.	None allowed.
Different aspect of yarn	Slug, thin filling, or any defects on the yarn that creates a variation of thickness.	None allowed.
Dry or boardy areas	Areas with no resin or areas with hardened resin.	None allowed.
Folds	Separation of the prepreg from the release film caused by folding of the material.	None allowed.
Fuzz ball	Loose and frayed fibers that have formed into a ball and then been incorporated into the tape.	Fuzz balls that do not cause a sudden discernible change in the prepreg thickness are acceptable, provided the overall thickness change is not more than 50% of the nominal tape thickness.

Defect	Defect Description	Criteria ⁽¹⁾
Gaps	Gaps within or between filament bundles.	No gap within or between filament bundles shall exceed 0.75 mm. The length of any portion of a gap within or between filament bundles shall not exceed 250 mm. Gaps in line with each other and no more than 25 mm apart shall be regarded as one gap, regardless of the number.
Misaligned fibers	A fiber that does not follow a straight line and crosses other fibers.	None allowed.
Non-homogeneous color	Areas with different color.	None allowed.
Poor edge quality	The edges shall not show a resin rim and shall be free from dry fuzzed or loose fibers, and from paper shreds.	None allowed.
Puckers	A fiber that buckles, or a raised local area of fiber tow.	None allowed.
Resin distribution	Visual resin starved or resin rich areas.	None allowed.
Resin homogeneity and form	Undissolved (except by design) or cured resin particles.	None allowed.
Slug	An abrupt thickening of the yarn.	The extra thickness shall not be more than 10% of the nominal tape thickness.
Stain	Blotch or spot.	None allowed.
Stripe	Streak.	None allowed.
Twists	Raised fiber tows that rotate in the fiber direction.	None allowed.
Un-spliced yarns or tows	Any yarn or tow ends not joined.	No un-spliced tows or yarns allowed. Splices in the same tow shall not be less than 3 m apart; splices in adjacent tows shall not be less than 300 mm apart.
Unwetted fibers	Fibers that have no resin.	None allowed.
Waviness	Waviness of tape when measured against a straight edge.	Maximum acceptable waviness of any 300 mm length of tape shall be ± 0.75 mm from the tape edge when measured with an appropriate straight edge.

⁽¹⁾ Items meeting the acceptable limits are not to be counted as defects.

3.2.4 Technical Requirements for Film Adhesive

3.2.4.1 Film Adhesive Requirements

The film adhesive shall be produced from an epoxy or modified epoxy resin produced in accordance with the TS and meeting the requirements of the relevant MS when tested in accordance with AMS6885/2.

The material shall be uniform in quality and condition and shall not exhibit characteristics detrimental to handling, lay-up, or mechanical properties.

Each roll and kit in the film adhesive batch shall meet the length and width requirements of AMS6885/4. The specific tolerances on the film adhesive rolls and kits width and length are also defined in AMS6885/4.

Materials shall be packaged and shipped in accordance with requirements defined in AMS6885/4.

3.2.4.2 Defects

Any defects in excess of that defined shall be cause for rejection of the specific material delivery or roll, according to the following requirements:

- a. Defect description terms are listed in [Table 2](#).
- b. A defective area is the length of the defect, if that defect exceeds specified limits, multiplied by the roll width.
- c. Defective areas (including an allowance of 1.5 m either side of the defective area) are not part of the delivered quantity and shall not be included in the cost of the material. The purchaser shall not be charged for any defective area. In addition, credit shall be given to the purchaser by the manufacturer for any manufacturing defect of the delivered material discovered during use that had not been previously identified and credited.
- d. The cumulative defective area in a roll shall not exceed 10% of the roll area.
 1. The quantity of defects shall not exceed more than one per 100 m as an average per roll with a minimum distance between defects of 35 m. Unless otherwise specified, only a maximum of five defects/flags per roll is acceptable.
 2. All defects within a length of 1 m are counted as one defective area.

Kits will be free of defects when the length is ≤ 10 m. When kits are more than 10 m in length tape roll requirements will apply.

3.2.4.3 Defect Recording and Marking

Except otherwise agreed between the manufacturer and the CACRC-QPG and specified in the Individual Product Sheet (IPS) of the Qualified Product, defects shall be marked as follows:

- a. Each defect shall be identified and flagged with a colored mark positioned at the edge of the film.
- b. A continuous defect shall be identified with a colored mark at the start and with a different colored mark at the end of the defect.
- c. Rolls with defects shall be marked with red stickers and rolls without faults with green stickers.

Each roll shall have a defect record attached, which must include the following information:

- a. Sequential number of defects.
- b. Type of defect.
- c. The start and end of each defective area in meters, measured from the beginning of the film adhesive when it is unrolled, unless otherwise agreed between supplier and purchaser.

Defects not recorded by the manufacturer and detected by the user during application of the material shall be handled similar to recorded defects.

3.2.4.4 Defect Criteria

The items in [Table 2](#) are considered as defects. They will be taken into account for material length calculation and for reporting according to [3.2.4.2](#) and [3.2.4.3](#), respectively.