Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3898

Issued 6-15-75
Revised

INTERLEAF CARRIER MATERIAL, COMPOSITE TAPE

1. SCOPE:

1.1 Form: This specification and its supplementary detail specifications cover interleaf carrier materials used to support uncured, resin-impregnated, fiber-reinforced tapes.

1.2 Application: To support uncured composite tapes during shipment, storage, handling, and layup, and to separate layers of the composite tape on reels; perforated material is used for layup on sprocket-driven tape laying machines.

1.3 Classification: The interleaf carrier shall be as specified in the applicable detail specification wherein each material is defined by material description. The material covered by each detail specification appears as part of the title thereof.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

ASTM D827 - Edge Tearing Strength of Paper
ASTM D882 - Tensile Properties of Thin Plastic Sheeting
ASTM D1000 - Testing Pressure-Sensitive Adhesive Coated Tapes Used for Electrical Insulation

2.3 Aerospace Industries Association of America Publications: Available from National Standards Association, Inc., 1321 14th Street N. W., Washington, D. C. 20005.

NAS 992 - Reel, Composite Filament Tape, Automated Machine Layup

3. TECHNICAL REQUIREMENTS:

3.1 Detail Specifications: The requirements for a specific material shall consist of all the requirements specified herein in addition to the requirements specified in the applicable detail specification. In the case of conflict between the requirements of this basic specification and an applicable detail specification, the requirements of the detail specification shall govern.

3.2 Material:

Printed in U.S.A.

3.2.1 Construction: The product shall consist of a film or paper-like material as defined in the applicable detail specification.

3.2.2 Splices: The product shall have not more than one splice in any 10 ft (3 m) of length. Splices shall be butted and polyethylene terephthalate taped on both sides to prevent loose flaps. The strength across any splice shall be equal to, or greater than, that of unspliced carrier.

3.2.3 Perforations: When perforated carrier is specified in the applicable detail specification, parallel rows of perforations shall be located on the carrier adjacent to each edge as shown in Fig. 1.

3.3 Properties: The product shall conform the requirements of 3.3.1, 3.3.2, 3.3.3, and 3.3.4 of this specification and those of the applicable detail specification. Tests shall be performed on the product supplied and in accordance with applicable test procedures specified herein.

3.3.1 Release: The surface of the carrier shall release cleanly from the uncured, resin-impregnated material specified in the applicable composite material specification. Release shall be even and uniform, without transfer of resin or fibers from the carrier surface to the pressure sensitive tape, determined in accordance with 4.5.3.

3.3.2 Stability: The product shall not be affected by exposure to temperatures of -40° to $+40^{\circ}$C (-40° to $+104^{\circ}$F) and 50% to 80% relative humidity.

3.3.3 Thermal Expansion: The product shall not change in length by more than 0.5% over the temperature range -18° to $+32^{\circ}$C (-0.4° to $+89.6^{\circ}$F) and relative humidity of 50 to 80%, determined in accordance with 4.5.4.

3.3.4 Color: The product shall be any color readily visible against the specified composite tape, except that neither black nor colorless, transparent films shall be supplied.

3.4 Quality: The product shall be uniform in quality and condition, clean, smooth, and free from foreign materials and from imperfections detrimental to the handling and application of the composite tape during machine layup. The carrier shall be free from unbonded fibers or cuttings, either at the trimmed edges or on the surface. The trimmed edges shall have no notches, tears, or slivers. Wrinkles, overlaps, and folds are not acceptable.

3.5 Tolerances: Unless otherwise specified, the following tolerances shall apply:

3.5.1 Thickness: Shall be as specified in the applicable detail specification.

3.5.2 Width: Shall be as ordered, with the following tolerances; all widths are available unperforated; only the 4.000-in. (101.60-mm) width is available perforated:

a. 0.500 in. ± 0.010 (12.70 mm ± 0.25) to 3.000 in. ± 0.010 (76.20 mm ± 0.25)

b. 3.500 in., +0, -0.005 (88.90 mm, +0, -0.13)

c. 4.000 in., +0, -0.005 (101.60 mm, +0, -0.13)

d. 5.000 in. ± 0.015 (127.00 mm ± 0.38) to 12.000 in. ± 0.015 (304.80 mm ± 0.38)

3.5.3 Length: 440 yd ± 1 (402 m ± 1).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to material (3.2), release (3.3.1), color (3.3.4), quality (3.4), and tolerance (3.5) requirements are classified as acceptance or routine control tests.

4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification and the applicable detail specification are classified as qualification or periodic control tests and may be the basis for approval of the product (See 4.4.1).

4.3 Sampling: Sufficient material shall be taken from each lot to perform all required tests in triplicate.

4.3.1 Lot: A lot shall be all product produced in a single production run from the same batch of raw materials under the same fixed conditions and submitted for vendor's inspection at one time. A lot may be packaged in smaller quantities, or slit to narrower widths than as manufactured, and delivered separately under the basic lot approval as long as lot identity is maintained.

4.4 Approval:

4.4.1 Sample material shall be approved by purchaser before material for production use is supplied, unless such approval be waived. Results of tests on production material shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production material which are essentially the same as those used on the approved sample material. If any change is necessary in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material and processing and, when requested, sample revised material. No production material made by the revised procedure shall be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Tensile Strength: Shall be determined in accordance with ASTM D882, Method A.

4.5.2 Tear Strength: Shall be determined in accordance with ASTM D827.

4.5.3 Release or Tack Test: The reel of interleaf carrier shall be located in a clean area and approximately 6 ft or 2 m of carrier unwound. A strip of pressure sensitive tape (3M type 250 or equal) shall be applied to the carrier surface in three areas approximately 1 ft or 300 mm apart and peeled free. Repeat the same technique on the opposite side of the carrier. The tape shall then be visually inspected for pickup of loose carrier fibers or transfer of surface films to the tape. Any material found on the surface of the pressure sensitive tape shall constitute failure.

4.5.4 Thermal Expansion: Approximately 10 ft or 3 m of carrier shall be removed from the end of the reel for thermal expansion test. Thermally condition the material at 32°C ± 1 or 90°F ± 2 and 50% relative humidity for 24 hr ± 1. A gauge length of 2 m shall be laid out at least 0.5 m from the ends, using a sharp pencil and rule. The accuracy should be within ± 1.00 millimetre. Place the interleaf carrier strip in an environmental chamber at -18°C ± 1 or 0°F ± 2 and relative humidity of 80% and hold for not less than 4 hours. Remove the interleaf carrier and measure for thermal expansion.

4.6 Reports: The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests made on the product to determine conformance to the acceptance test requirements of this specification and the applicable detail specification, and a statement that the product conforms to the other technical requirements. This report shall include the purchase order number, material specification number including the applicable detail specification number, vendor's material designation, lot number, date of manufacture, and quantity.

4.7 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Unperforated product shall be supplied in rolls or wound on reels, as ordered. Perforated product shall be wound on reels. Each reel shall contain not more than 440 yd or 402 m of product. Winding on reels shall be uniform and provide for proper unreeling. Product ends shall be secured. Each roll or reel shall be sealed in a suitable, non-adherent, moisture-proof material.

5.1.1.1 Unperforated product shall be supplied on NAS 992, Type I or Type II reels, as ordered. Perforated product shall be supplied on NAS 992, Type III reels.

5.1.2 Each roll or reel shall be identified by attached removable tags using characters of such size as to be clearly legible and which will not be obliterated by normal handling. Each tag shall be marked to show the following information:

INTERLEAF CARRIER, COMPOSITE TAPE

AMS 3898/ *
PURCHASE ORDER NUMBER _____
MANUFACTURER'S MATERIAL DESIGNATION _____
DATE OF MANUFACTURE _____
LOT NUMBER _____
SIZE AND QUANTITY _____
* Insert applicable detail specification number

5.1.3 Packaging shall be accomplished in such a manner as to ensure that the product, during shipment and storage, will not be permanently distorted and will be protected against damage from exposure to weather or any normal hazard.

5.1.4 Each exterior shipping container shall be legibly marked with the information of 5.1.2 in such a manner that the markings shall not smear or be obliterated during normal handling or use.

5.1.5 The product shall be prepared for shipment in accordance with commercial practice to assure carrier acceptance and safe transportation to the point of delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and the applicable detail specification number in all quotations and when acknowledging purchase orders.