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400 Commonwealth Dr., Warrendale, PA 15096

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3807

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Submitted for recognition as an American National Standard

TAPE, ALUMINUM FOIL, SOUND AND VIBRATION DAMPING
Pressure Sensitive

1. SCOPE:

1.1 Form: This specification covers aluminum foil in the form of tape with a pressure sensitive adhesive.

1.2 Application: Primarily for alleviation of sound and vibration in areas where excessive noise may prevail.

1.3 Classification: Tape covered by this specification is classified as follows:

Type I - Dead soft aluminum, intended primarily for application where low-to-medium temperatures and moderate sound and vibration damping are required.

Type II - Fiberglass-laminated-aluminum, intended primarily for application where higher temperatures and maximum sound and vibration damping are required.

1.3.1 Unless a specific type is ordered, either type may be supplied.

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

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 4011 - Aluminum Alloy Foil, 1145-0
AMS 4041 - Aluminum Alloy Sheet and Plate, Alclad, 4.4Cu - 1.5Mg - 0.60Mn, (Alclad 2024 and 1-1/2% Alclad 2024, -T3 Flat Sheet, 1-1/2% Alclad 2024-T351 Plate)

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

ASTM D1000 - Testing Pressure Sensitive Adhesive Coated Tapes For Electrical Insulation
ASTM D3611 - Accelerated Aging of Pressure-Sensitive Tapes
ASTM D3652 - Thickness of Pressure-Sensitive and Gummed Tapes
ASTM D3715 - Quality Assurance of Pressure-Sensitive Tapes
ASTM D3951 - Commercial Packaging
ASTM E756 - Measuring Vibration-Damping Properties of Materials

2.3 U. S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Specification:

O-T-620 - 1,1,1 Trichloroethane, Technical, Inhibited (Methyl Chloroform)

PPP-T-680 - Tape, Pressure Sensitive Adhesive; Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Material: Tape shall consist of an aluminum foil backing coated on one side with a pressure-sensitive adhesive.

3.1.1 Backing (Type I): Shall be smooth and scratch-free AMS 4011 aluminum alloy foil.

3.1.2 Backing (Type II): Shall be the same as Type I except that the aluminum foil shall be laminated on the inside (adhesive side) with a smooth, uniform layer of fiberglass.

3.1.3 Adhesive: Shall be pressure-sensitive, homogeneous, and coated in a smooth and evenly distributed layer on one side of the backing. The adhesive shall cause the tape to adhere immediately and firmly to clean, dry surfaces without wrinkling, curling, breaking, or lifting. A liner over the adhesive shall be available as an option.

3.1.4 Color: Types I and II shall be a natural aluminum color and may be either shiny or matte in luster.

3.2 Properties: Tape shall conform to the following requirements, determined in accordance with specified test methods on samples from rolls of tape conditioned for not less than 24 hr at 23°£ ± 2 (73°F ± 4) and 50% ± 5 relative humidity:

3.2.1	Thickness,	Type I	0.008 - 0.020 in. (0.20 - 0.50 mm)	ASTM D3652
		Type II	0.005 - 0.010 in. (0.12 - 0.25 mm)	
3.2.2	Tensile Breaking Strength, Dry, min			ASTM D1000
		Type I and II	100.0 lb per in. of width 17,500 N/m of width	
3.2.3	Elongation, Dry, min			ASTM D1000
		Type I	10%	
		Type II	6%	
3.2.4	Adhesion to Steel			ASTM D1000
3.2.4.1	Initial, min	Type I	60 oz per in. of width (0.65 N/mm of width)	
		Type II	40 oz per in. of width (0.45 N/mm of width)	
3.2.4.2	After Aging, min			4.5.1
		Type I	55 oz per in. of width (0.60 N/mm of width)	
		Type II	35 oz per in. of width (0.40 N/mm of width)	

3.2.5 Compatibility: Type I shall show no evidence of deterioration of the backing and shall show no adhesive mass transfer on removal of the tape from the test panel, determined in accordance with 4.5.3. Type II shall show no evidence of delamination of the fiberglass from the aluminum in addition to showing the same results as Type I.

3.2.6 Corrosion Resistance: Test panels shall show no evidence of pitting or corrosion when tested in accordance with 4.5.2.

3.2.7 Sound and Vibration Damping: Tape shall dampen sound and vibration, determined in accordance with 4.5.4. Standards for acceptance shall be as agreed upon by purchaser and vendor.

3.2.8 Shelf Life: The tape shall meet the requirements of 3.2.1 through 3.2.5 at any time up to twelve months from date of receipt by purchaser when stored indoors at 30°£ (85°F) or lower.

3.3 Quality: Tape, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the tape. Edges shall be straight, true, and unbroken.

3.4 Width: Shall be 1/2, 3/4, 1, 2, 3, 4, or 6 in. (12.5, 20, 25, 50, 75, 100, or 150 mm) or as ordered. A width tolerance of ±1/32 in. (±0.08 mm) shall be allowed.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the tape shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the tape conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for thickness (3.2.1), tensile breaking strength (3.2.2), elongation (3.2.3), and adhesion to steel (3.2.4.1 and 3.2.4.2) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of tape to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be in accordance with ASTM D3715 except when 4.3.1 applies.

4.3.1 When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3 and the report of 4.6 shall state that such plan was used.

4.4 Approval:

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

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production tape which are essentially the same as those used on the approved sample tape. If necessary to make any change in type of equipment for processing, ingredients, or manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material, processing, or both and, when requested, sample tape. Production tape made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Aging: The adhesion after aging shall be determined by first aging rolls of tape in accordance with ASTM D3611 for 288 hr ± 8 and testing for adhesion in accordance with 3.2.4.2.

4.5.2 Corrosion Resistance: A minimum of six AMS 4041 aluminum alloy test panels, 3 x 6 in. (75 x 150 mm) by not less than 0.020 in. (0.50 mm) in thickness, shall be cleaned with O-T-620, Type I, 1, 1, 1 trichloroethane. The cleaned panels shall then be taped with parallel strips of 1 in. (25 mm) wide tape 1/4 in. (6 mm) apart and running the full length of each panel. A rubber roller or squeegee shall be used to apply the tape to ensure no air is entrapped and edges are flush with the panels. Panels shall be conditioned in accordance with ASTM D3611 for 288 hr ± 8. At the end of weatherometer testing, the test panels shall show no evidence of pitting or corrosion when tape is removed.

4.5.3 Compatibility: There shall be no evidence of adhesive residue on the surface of the panels when tape is removed from the test panels after testing in accordance with 4.5.2.

4.5.4 Sound and Vibration Damping Ability: Tape shall adequately dampen sound and vibration when tested using the Oberst Bar method, damped one side, and calculated using Young's modulus in accordance with ASTM E756.

4.6 Reports: The vendor of tape shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the tape conforms to the other technical requirements of this specification unless waived by purchaser. This report shall include the purchase order number, AMS 3807, type number, lot number, vendor's designation, and quantity.

4.7 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the tape 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 tape represented and no additional testing shall be permitted. Results of all tests shall be reported.