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AEROSPACE MATERIAL SPECIFICATION

AMS 4011

Issued 11-1-68
Revised 7-1-85

ALUMINUM ALLOY FOIL
1145-0
For Electronic Applications

UNS A91145

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 3-28-79. It is recommended that this specification not be specified for new designs.

This cover sheet should be attached to the original issue of the subject specification.

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1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily for use in capacitors and electronic component parts.

3. COMPOSITION:

	min	max
Aluminum	99.45	--
Iron + Silicon	--	0.55
Copper	--	0.05
Manganese	--	0.05
Other Impurities, each	--	0.03

4. CONDITION: Annealed with bright finish on one side and matte on the other.

4.1 Foil shall be supplied in rolls, with dry or slick surface condition, as ordered.

Note. The surface condition of the foil may be determined by placing drops of water-alcohol solutions containing various percentages of alcohol on the foil and observing the wetting of the surface. The degree of oiliness is stated as wettable with 10% alcohol solution, 25% alcohol solution, etc.

5. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

5.1 Breaking Load: When tested using 1 in. wide specimens of single thickness or complete specimens consisting of multiple thicknesses, the foil shall conform to the following breaking load requirements; splices shall be capable of developing 80% of the specified breaking load.

Nominal Thickness Inch	Breaking Load lb per in. of Width min
0.00017	1.1
0.00020	1.3
0.00023	1.4
0.00025	1.6
0.00030	1.9
0.00035	2.2
0.00040	2.6
0.00045	2.9
0.00050	3.2

5.1.1 Single-Thickness Tests: The average of five test specimens 1 in. wide clamped in testing machine jaws set at least 5 in. apart and tested with load applied by operating testing machine at a rate of approximately 0.01 in. per in. per min. to slightly greater than the yield strength and then at a rate of 0.4 in. per in. per min. to breaking load, shall conform to the requirements of 5.1.

5.1.2 Multiple-Thickness Tests: Composite specimens 1 in. wide by not less than 12 in. long consisting of 5 thicknesses of foil placed between two sheets of heavy paper clamped in testing machine jaws set 8 in. apart and tested to failure with load applied at a uniform rate of approximately 0.5 lb per sec shall conform to the requirements of 5.1. The breaking strength of the heavy paper used, as determined by testing specimens of the same type and weight of paper alone, shall be deducted from the test results.

5.1.2.1 When the results of tests obtained with multiple-thickness specimens do not agree with those obtained with single-thickness specimens, single-thickness test results shall apply.

5.2 Electrical Resistance: The product, when tested in accordance with ASTM B193 at 60 - 80 F (15.6 - 26.7 C), shall be capable of meeting the following direct current electrical resistance requirements to an accuracy of plus or minus 0.003 ohms.

Nominal Thickness Inch	DC Electrical Resistance for 1 In. Width Ohm per Ft of Length, max
0.00017	0.124
0.00020	0.105
0.00023	0.091
0.00025	0.084
0.00030	0.070
0.00035	0.060
0.00040	0.052
0.00045	0.047
0.00050	0.042

5.3 Area Per Pound: Using 32 sq in. specimens and a density of 0.0978 lb per cu in., the foil shall conform to the following requirements when values are rounded off to the nearest 100 sq in. in accordance with the rounding off method of ASTM E29:

Nominal Thickness Inch	Nominal Covering Area per lb Sq Inch
0.00017	60,100
0.00020	51,100
0.00023	44,500
0.00025	40,900
0.00030	34,100
0.00035	29,200
0.00040	25,600
0.00045	22,700
0.00050	20,400

6. QUALITY: Material shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to the following:

7.1 Thickness: Thickness, determined by the method specified for thin foil in ASTM E252 on five specimens for each nominal thickness, shall not deviate from the specified thickness by more than ± 10%.