AEROSPACE MATERIAL SPECIFICATION

AMS5036™	REV. H

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Superseding AMS5036G

Steel Sheet and Strip, Aluminum Coated, Low Carbon

RATIONALE

AMS5036H has been reaffirmed to comply with the SAE five-year review policy.

NONCURRENT NOTICE

This specification has been declared “NONCURRENT” by the Aerospace Materials Division, SAE, as of September 2001. It is recommended, therefore, that this specification not be specified for new designs.

“NONCURRENT” refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division, however, does not recommend these as standard materials for future use in new designs. Each of these “NONCURRENT” specifications is available from SAE.

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1. SCOPE:

1.1 Form:

This specification covers a low-carbon steel in the form of sheet and strip coated on both faces with aluminum-silicon alloy by the hot-dip process.

1.2 Application:

Primarily for low-stressed parts, such as brackets, clips, and sheathing, requiring corrosion resistance and oxidation resistance up to 1200°F (650°C).

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 2232	Tolerances, Carbon Steel Sheet, Strip, and Plate
MAM 2232	Tolerances, Metric, Carbon Steel Sheet, Strip, and Plate
AMS 2259	Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2350	Standards and Test Methods
AMS 2370	Quality Assurance Sampling of Carbon and Low-Alloy Steels, Wrought Products Except Forgings and Forging Stock

2.2 ASTM Publications:

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

ASTM B117	Salt Spray (Fog) Testing
ASTM E290	Semi-Guided Bend Test for Ductility of Metallic Materials
ASTM E350	Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

3.1.1 Basis Steel: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E350 or by spectrographic or other analytical methods approved by purchaser:

	min	max
Carbon	--	0.10
Manganese	0.25	0.50
Phosphorus	--	0.04
Sulfur	--	0.05

3.1.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

3.1.2 Coating: Shall consist of a uniform layer of an aluminum-silicon (5 - 11% silicon) alloy on each side of the steel sheet or strip.

3.2 Condition:

Aluminum killed, cold rolled, and rerolled after coating.

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 Corrosion Resistance: The product shall show no evidence of corrosion of the basis steel when subjected for not less than 200 hr to a continuous salt spray corrosion test in accordance with ASTM B117. Corrosion of basis steel at cut edges shall be disregarded.

3.3.2 Bending Properties: Shall be as follows, determined in accordance with ASTM E290:

3.3.2.1 The product shall withstand, without flaking or peeling of the coating on the outside of the bend, bending at room temperature in any direction through an angle of 180 deg over a diameter equal to twice the nominal thickness of the product.

3.3.2.2 The product shall withstand, without cracking of the basis steel, bending at room temperature in any direction through an angle of 180 deg flat on itself.

3.3.3 Coating Weight: Shall be 0.30 - 0.50 oz per sq ft (95 - 160 g/m^2), determined as in 3.3.3.1 on specimens as in 4.3.1.

3.3.3.1 Each specimen (4.3.1) shall be cleaned by washing thoroughly in petroleum ether or other suitable solvent, dried thoroughly, and weighed to the nearest 0.005 gram. Immerse each specimen in hot [approximately 150°F (65°C)] 20% sodium hydroxide solution until evolution of gases ceases. Remove specimens, scrub under running water, blot with a towel to remove the water, and immerse for 2 - 3 sec in cold concentrated hydrochloric acid. Remove specimens from the acid, scrub under running water, and reimmerse in the sodium hydroxide solution until action again ceases. Repeat this cycle until immersion in the sodium hydroxide shows no visible reaction. Remove the specimens, scrub under running water, dry, and reweigh. The loss in weight in grams is equal to the weight of coating in oz per sq ft (0.315 kg/m^2).

3.3.3.1.1 In the above procedure it is very important that the water be removed from the surface of the specimens before immersion in the hydrochloric acid since diluted hydrochloric acid will attack the base metal to a greater extent than the concentrated acid.

3.4 Quality:

The product, 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 product.

3.5 Tolerances:

Shall conform to all applicable requirements of AMS 2232 or MAM 2232, except for thickness as specified in 3.5.1.

3.5.1 Thickness: Shall be as specified in Table I.

TABLE I

Nominal Thickness Inch			Tolerance, Inch plus and minus
Up	to 0.020,	incl	0.003
Over 0.020	to 0.029,	incl	0.004
Over 0.029	to 0.049,	incl	0.005
Over 0.049	to 0.069,	incl	0.006
Over 0.069	to 0.079,	incl	0.007
Over 0.079	to 0.089,	incl	0.008
Over 0.089	to 0.1875,	excl	0.009

TABLE I(SI)

Nominal Thickness Millimetres			Tolerance, Millimetre plus and minus
Up	to 0.50,	incl	0.08
Over 0.50	to 0.70,	incl	0.10
Over 0.70	to 1.20,	incl	0.12
Over 1.20	to 1.70,	incl	0.15
Over 1.70	to 2.00,	incl	0.18
Over 2.00	to 2.20,	incl	0.20
Over 2.20	to 4.70,	excl	0.22

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product 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 4.4. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling:

Shall be in accordance with AMS 2370.

4.3.1 Specimens for coating weight determination (3.3.3) shall be approximately 2-1/4 in. (55 mm) square or 5 sq in. (30 cm^2); weight losses shall be corrected for the actual area of the specimens. Three specimens shall be cut to represent each sample sheet of strip; one of these specimens shall be cut to represent the center and the other two specimens from diagonally opposite corners of the sample. The corner specimens shall be at least 4 in. (100 mm) from the end and at least 2 in. (50 mm) from the side of the sheet or strip.

4.3.1.1 Product Over 12 In. (300 mm) in Nominal Width: Cut specimens from one flat sheet or strip from each lot. For coiled product, cut a sample approximately 18 in. (450 mm) long by the full width of the coil from one end of the coil and cut the specimens from this sample.

4.3.1.2 Product 12 In. (300 mm) and Under in Nominal Width: Cut samples not less than 18 in. (450 mm) long from one end of one to three coils or flat sheets or strips, as applicable, from each lot. Cut specimens from the sample or samples, observing the end distance and, insofar as width permits, the edge distance requirements of 4.3.1.

4.4 Reports:

4.4.1 The vendor of the product shall furnish with each shipment a report showing the results of tests for chemical composition of each heat of basis steel and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, heat number, AMS 5036H, size, and quantity from each heat.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment a report showing the purchase order number, AMS 5036H, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification and shall include in the report either a statement that the material conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting:

Shall be in accordance with AMS 2370.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

The product shall be identified as in 5.1.1 unless purchaser permits a method from 5.1.2.