



AEROSPACE MATERIAL SPECIFICATION

AMS 4916B

Superseding AMS 4916A

Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N. Y. 1000

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TITANIUM ALLOY SHEET, STRIP, AND PLATE 8Al - 1Mo - 1V Duplex Annealed

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for parts requiring good strength and high fracture toughness up to 800 F (427 C).
3. COMPOSITION:

	min	max
Aluminum	7.35	8.35
Molybdenum	0.75	1.25
Vanadium	0.75	1.25
Iron	--	0.30
Oxygen	--	0.12
Carbon	--	0.08
Nitrogen	--	0.05 (500 ppm)
Hydrogen	--	0.015 (150 ppm)
Other Elements, each (1)	--	0.10
Other Elements, total (1)	--	0.40
Titanium	remainder	

(1) Determination not required for routine acceptance.

- 3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2249.
4. CONDITION: Unless otherwise ordered, the product shall be supplied in the following condition:
 - 4.1 Sheet and Strip: Hot rolled, with or without subsequent cold reduction, duplex annealed, descaled, and cleaned free of surface contamination, having a surface appearance comparable to a commercial corrosion resistant steel No. 2D Finish.
 - 4.2 Plate: Hot rolled, duplex annealed, and descaled.
5. TECHNICAL REQUIREMENTS:
 - 5.1 Annealing: Unless otherwise specified, material shall be duplex annealed by heating to 1450 F \pm 25 (787.8 C \pm 14), holding at heat for 8 hr, cooling at a rate not faster than 100 F deg (56 C) deg per hr to below 900 F (482 C), and cooling to room temperature, then reheating to 1450 F \pm 25 (787.8 C \pm 14), holding at heat for 15 min., and air cooling to room temperature.

SAE Technical Board rules provide that: "All technical reports, including standards approved by the Board, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

- 5.2 **Tensile Properties:** These properties apply when the rate of strain is maintained at 0.003 - 0.007 in. per in. per min. through the yield strength and then is increased so as to produce failure in approximately one additional minute. When a dispute occurs between purchaser and vendor over the yield strength values, a referee test shall be performed on a machine having a strain rate pacer, using a rate of 0.005 in. per in. per min. through the yield strength and a minimum cross head speed of 0.10 in. per min. above the yield strength.

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset psi, min	Elongation % in 2 in. or 4D min
0.008 to 0.014, incl	135,000	120,000	8
Over 0.014 to 0.187, incl	135,000	120,000	10
Over 0.187 to 1.000, incl	130,000	120,000	10
Over 1.000 to 2.000, incl	125,000	115,000	10
Over 2.000 to 4.000, incl	120,000	110,000	8

- 5.3 **Bending:** Material shall withstand, without evidence of cracking when examined at 20X magnification, bending at room temperature through an angle of 105 deg around a diameter equal to the bend factor times the nominal thickness of the material, using either V-block, U-channel, or free bend procedure. Unless otherwise specified, the axis of bend shall be parallel to the direction of rolling. For V-block and U-channel bend tests, specimen width shall be not less than 10 times the nominal thickness but not less than 1 inch. For free bend tests, minimum specimen width shall, when possible, be not less than 10 times the nominal thickness; maximum width need not be greater than 1 inch. Only one of these tests will be required in routine inspection. In case of dispute, results of bend tests using the V-block procedure shall govern.

Nominal Thickness Inch	Bend Factor
Up to 0.070, incl	8
0.070 to 0.1875, excl	9

- 5.4 **Fracture Toughness:** When specified, a fracture toughness test shall be performed. The test method and fracture toughness requirements shall be as agreed upon by purchaser and vendor.

6. **QUALITY:** Unless otherwise specified, material shall be produced by multiple melting using consumable electrode practice; at least one of the melting cycles shall be under vacuum. The product shall be uniform in quality and condition, clean, sound, and free from "oil cans" of depth in excess of the flatness tolerance, ripples, and foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

Note. An "oil can" is defined as an excess of material in a localized area of a sheet which causes the sheet to buckle in that area. When the sheet is placed on a flat surface and hand pressure applied to the buckle, the buckle will spring through to the opposite surface or spring up in another area of the sheet.

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

7.1 **Thickness, Width, Length, and Straightness:** The latest issue of AMS 2242.

7.2 **Flatness:** Flatness tolerance for material 36 in. and under in width and less than 0.1875 in. thick shall be 3%. Flatness tolerance for material under 0.1875 in. thick and over 36 in. wide and for material 0.1875 in. and over in thickness in all widths shall be as agreed upon by purchaser and vendor.