

# AEROSPACE MATERIAL SPECIFICATIONS

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AMS 5512c

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## STEEL SHEET, STRIP, AND PLATE, CORROSION AND HEAT RESISTANT 18Cr - 11Ni - (Cb + Ta) (SAE 30347)

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **APPLICATION:** Parts and assemblies requiring both corrosion and heat resistance and especially when such parts and assemblies are welded during fabrication. Parts and assemblies requiring oxidation resistance up to approximately 1500 F (816 C), but useful at that temperature only when stresses are low.
3. **COMPOSITION:**

	min	max
Carbon	--	0.08
Manganese	--	2.00
Silicon	0.50	1.00
Phosphorus	--	0.040
Sulphur	--	0.030
Chromium	17.00	19.00
Nickel	9.00	12.00
Columbium + Tantalum	10xC	1.10
Molybdenum	--	0.50
Copper	--	0.50

- 3.1 **Check Analysis:** Composition variations shall meet the requirements of the latest issue of AMS 2248.

### 4. **CONDITION:**

- 4.1 **Sheet:** Cold rolled, solution heat treated, and descaled (No. 2D Finish).
- 4.2 **Strip:** Cold rolled, solution heat treated, and descaled (No. 1 Strip Finish).
- 4.3 **Plate:** Hot rolled, solution heat treated, and descaled.

### 5. **TECHNICAL REQUIREMENTS:**

#### 5.1 **Tensile Properties:**

Ø	Nominal Thickness Inches	Tensile Strength psi, max	Elongation % in 2 in. or 4D, min
	Over 0.002 to 0.003, incl	115,000	20
	Over 0.003 to 0.004, incl	110,000	30
	Over 0.004	105,000	40

- 5.1.1 For widths 9 in. and over, tensile test specimens shall be taken with the axis perpendicular to the direction of rolling. For widths less than 9 in., tensile test specimens shall be taken with the axis parallel to the direction of rolling.

- 5.2 Bending: Material shall withstand, without cracking, bending at room temperature through the angle indicated below around a diameter equal to the bend factor times the nominal thickness of the material, with axis of bend parallel to the direction of rolling.

Nominal Thickness Inch	Type of Bend	Angle deg, min	Bend Factor
Up to 0.249, incl	Free Bend	180	1
Up to 0.249, incl	V-Block	135	1
Over 0.249 to 0.749, incl	Free Bend	90	1
Over 0.249 to 0.749, incl	V-Block	135	2

- 5.3 Embrittlement: Material shall be capable of meeting the following test:

- 5.3.1 Test specimens, after being heated at  $1200\text{ F} \pm 10$  ( $648.9\text{ C} \pm 5.6$ ) for 2 hr and air cooled, shall withstand immersion for 48 hr in a boiling aqueous solution containing 100 g of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  and 100 ml of  $\text{H}_2\text{SO}_4$  (sp gr 1.84) per liter of solution under a reflux condenser, without evidence of intercrystalline surface attack. After such immersion, specimens from material 0.749 in. and under in thickness shall withstand bending as in 5.2.

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 all applicable requirements of the latest issue of AMS 2242; for thickness of plate, Table III shall apply and for flatness of sheet, Table VI shall apply.

## 8. REPORTS:

- 8.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat in the shipment and the results of tests on each thickness from each heat to determine conformance to the tensile and bending requirements of this specification. This report shall include the purchase order number, heat number, material specification number, thickness, size, and quantity from each heat.

- 8.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, 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 a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

9. IDENTIFICATION: Unless otherwise specified, each sheet, strip, and plate shall be marked, in the respective location indicated below, with AMS 5512C, manufacturer's identification, heat number, and nominal thickness in inches. The characters shall be not less than 3/8 in. in height, shall be applied using a suitable marking fluid, and shall be capable of being removed in hot alkaline cleaning solution without rubbing. The markings shall have no deleterious effect on the material or its performance. The characters shall be sufficiently stable to withstand normal handling.

- 9.1 Flat Sheet, Flat Strip Over 6 in. in Width, and Plate: Shall be marked in lengthwise rows of characters, recurring at intervals not greater than 2 ft, the rows being spaced not more than 3 in. apart and alternately staggered.

- 9.2 Flat Strip 6 in. and Under in Width: Shall be marked near one end.