

# AERONAUTICAL MATERIAL SPECIFICATIONS

**AMS 5547**

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

Issued 9-15-57  
Revised

## STEEL SHEET AND STRIP, CORROSION AND MODERATE HEAT RESISTANT 15.5Cr - 4.5Ni - 2.9Mo - 0.1N

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. FORM: Sheet, strip, and plate.
3. APPLICATION: Primarily for parts and assemblies requiring high strength and oxidation resistance up to 800 F and where parts require welding during fabrication.
4. COMPOSITION:

|            |               | Check Analysis |             |
|------------|---------------|----------------|-------------|
|            |               | Under Min      | or Over Max |
| Carbon     | 0.10 - 0.15   | 0.01           | 0.01        |
| Manganese  | 0.50 - 1.25   | 0.04           | 0.04        |
| Silicon    | 0.50 max      | —              | 0.05        |
| Phosphorus | 0.040 max     | —              | 0.005       |
| Sulfur     | 0.030 max     | —              | 0.005       |
| Chromium   | 15.00 - 16.00 | 0.20           | 0.20        |
| Nickel     | 4.00 - 5.00   | 0.07           | 0.07        |
| Molybdenum | 2.50 - 3.25   | 0.10           | 0.10        |
| Nitrogen   | 0.07 - 0.13   | 0.01           | 0.01        |

### 5. CONDITION:

- 5.1 Sheet: Hot or cold rolled, annealed, and descaled (No. 2D Finish or equivalent).
- 5.2 Strip: Cold rolled, annealed, and descaled (No. 1 Strip Finish).
- 5.3 Plate: Hot rolled, annealed, and descaled.

### 6. TECHNICAL REQUIREMENTS:

- 6.1 Heat Treatment: Unless otherwise specified, material shall be annealed by heating to 1850 - 1975 F, holding at heat not for less than 90 min. per in. of thickness, and quenching in water or otherwise cooling as rapidly as possible to room temperature.
- 6.2 Hardness: Shall be not higher than Rockwell A 62 or equivalent.
- 6.3 Bending: Material shall withstand, without cracking, bending at room temperature through the angle indicated below around a diameter equal to three times the nominal thickness with axes of bends both perpendicular and parallel to direction of rolling.

| Nominal Thickness<br>Inch | Angle<br>deg, min |
|---------------------------|-------------------|
| 0.187 and under           | 180               |
| Over 0.187 to 0.249, incl | 130               |
| Over 0.249 to 0.749, incl | 90                |

- 6.4 Properties After Re-Annealing, Sub-Zero Cooling, and Tempering: Material re-annealed by heating to  $1710\text{ F} \pm 25$ , holding at heat for not less than 90 min. per in. of thickness, quenching in water or otherwise cooling as rapidly as possible to room temperature, cooled to not higher than  $-100\text{ F}$ , held at this temperature for not less than 3 hr, warmed in air to room temperature, heated to  $850\text{ F} \pm 25$ , held at heat for not less than 3 hr, and cooled in air shall be capable of meeting the following requirements:

6.4.1 Tensile Properties:

|                                                                                                           |             |
|-----------------------------------------------------------------------------------------------------------|-------------|
| Tensile Strength, psi                                                                                     | 190,000 min |
| Yield Strength at 0.2% Offset or at 0.0150 in.<br>in 2 in. Extension Under Load ( $E = 30,000,000$ ), psi | 165,000 min |
| Elongation, % in 2 in.                                                                                    | 10 min      |

- 6.4.1.1 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.

- 6.4.2 Hardness: Shall be Rockwell C 40 - 50 or equivalent.

7. 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.

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2242 as applicable.

9. REPORTS:

- 9.1 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 technical requirements of this specification. This report shall include the purchase order number, heat number, material specification number, thickness, size, quantity from each heat, and a statement of record of specific heat treating temperatures and cycles used to provide reported properties.