# AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

**AMS5527**

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Revised

## STEEL SHEET AND STRIP, CORROSION AND HEAT RESISTANT
## 20Cr - 9Ni - 1.4Mo - 1.4W - (Cb + Ta) - Ti
## Hot Rolled and Stress Relieved, 125,000 psi

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: Parts and assemblies such as tank shells, doublers, bulkhead rings, tail pipes and exhaust cones, requiring high strength up to 1000 F and oxidation resistance up to 1600 F.

4. COMPOSITION:

| | | Check Analysis Under Min | Check Analysis Over Max |
|---|---|---|---|
| Carbon | 0.28 - 0.35 | 0.02 | 0.02 |
| Manganese | 0.75 - 1.50 | 0.04 | 0.04 |
| Silicon | 0.30 - 0.80 | 0.05 | 0.05 |
| Phosphorus | 0.040 max | ---- | 0.005 |
| Sulfur | 0.030 max | ---- | 0.005 |
| Chromium | 18.00 - 21.00 | 0.25 | 0.25 |
| Nickel | 8.00 - 11.00 | 0.15 | 0.15 |
| Molybdenum | 1.00 - 1.75 | 0.05 | 0.05 |
| Tungsten | 1.00 - 1.75 | 0.05 | 0.05 |
| Columbium + Tantalum | 0.25 - 0.60 | 0.05 | 0.05 |
| Titanium | 0.10 - 0.35 | 0.00 | 0.05 |
| Copper | 0.50 max | ---- | 0.03 |

5. CONDITION:

5.1 Sheet: Hot rolled, stress relieved, and pickled (No. 1 Finish).

5.2 Strip: Cold Finished, stress relieved, and pickled (No. 1 Strip Finish).

5.3 Plate: Hot rolled, stress relieved, and pickled.

6. TECHNICAL REQUIREMENTS:

6.1 Stress Relief Heat Treatment: Material shall be heated to 1200 F ± 25 and air cooled.

6.2 Tensile Properties: Material with thickness up to 0.250 inch shall conform to the following requirements:

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| | |
|---|---|
| Tensile Strength, psi | 125,000 min |
| Yield Strength at 0.2% offset or at 0.0102 in. in 2 in. extension under load | 90,000 min |
| Elongation, % in 2 in. | 12 min |

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

6.2 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 axes of bends both perpendicular and parallel to the direction of rolling.

| Nominal Thickness Inch | Angles, Degrees Min | Bend Factor |
|---|---|---|
| 0.126 and under | 90 | 1 |
| Over 0.126 to 0.250, incl | 90 | 2 |

7. QUALITY: The product shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external defects detrimental to fabrication or to performance of parts.

8. TOLERANCES: Unless otherwise specified, tolerances for sheet and strip 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 and quantity from each heat.

9.2 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.

10. IDENTIFICATION: Unless otherwise specified, each sheet, strip and plate shall be marked in the respective location indicated below with AMS 5527, manufacturer's identification, 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 ordinary handling.

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