

# AERONAUTICAL MATERIAL SPECIFICATION

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

## AMS 5534

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Revised

### ALLOY SHEET AND STRIP, CORROSION AND HEAT RESISTANT Cobalt Base - 20Cr - 20Ni - 4Mo - 4W - 4Cb

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 welded turbine nozzle assemblies, burner liner parts, tail pipes, exhaust cone assemblies, and hollow turbine buckets or blades, requiring high strength up to 1500 F and oxidation resistance up to 1800 F.

4. **COMPOSITION:**

|            |       |     |       |
|------------|-------|-----|-------|
| Carbon     | 0.32  | -   | 0.42  |
| Manganese  | 2.00  | max |       |
| Silicon    | 1.00  | max |       |
| Phosphorus | 0.040 | max |       |
| Sulfur     | 0.030 | max |       |
| Chromium   | 18.50 | -   | 21.50 |
| Nickel     | 18.50 | -   | 21.50 |
| Molybdenum | 3.50  | -   | 4.50  |
| Tungsten   | 3.50  | -   | 4.50  |
| Columbium  | 3.50  | -   | 4.50  |
| Iron       | 5.00  | max |       |
| Cobalt     | 40.00 | min |       |

5. **CONDITION:** Unless otherwise specified, material shall be hot rolled, with or without subsequent cold reduction, annealed and pickled, having a surface appearance comparable to a commercial corrosion resistant steel No. 2D finish.

6. **TECHNICAL REQUIREMENTS:**

6.1 **Annealing:** Material shall be heated to 2150 F  $\pm$  20, followed by air-cooling.

6.2 **Physical Properties:** Material shall conform to the following requirements:

|                        |             |
|------------------------|-------------|
| Tensile Strength, psi  | 160,000 max |
| Elongation, % in 2 in. | 20 min      |
| Hardness, Rockwell C   | 35 max      |

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.

- 6.3 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<br>Inch | Angle, Degrees<br>Min | Bend Factor |
|---------------------------|-----------------------|-------------|
| Under 0.050               | 180                   | 1.5         |
| 0.050 and over            | 90                    | 2.0         |

7. QUALITY: Material 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 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 notarized report of the chemical composition of each heat in the shipment and the results of tests on each thickness from each heat to determine conformance to the physical property 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.
- 9.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a notarized 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 certification 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 with AMS 5534, 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.
- 10.1 Plate, flat sheet, and flat strip over 6 in. in width shall be marked in rows of recurring characters with rows parallel to the direction of rolling and spaced approximately 3 in. apart with alternate rows staggered.
- 10.2 Flat strip 6 in. and under in width shall be marked near each end.
- 10.3 Coiled sheet and strip shall be marked near the outside end of the coil, and, if practicable, near the inside end also.