AERONAUTICAL MATERIAL SPECIFICATION

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

AMS 5542B

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ALLOY SHEET, CORROSION AND HEAT RESISTANT
Nickel Base - 15Cr - 7Fe - 2.5Ti - 1Cb - 0.7Al

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: Primarily parts, such as buckets, blades, turbine nozzle vanes, and combustion chamber liners requiring high strength up to 1500 F and oxidation resistance up to 1800 F, and parts which may be formed and then heat treated to improve strength at elevated temperatures. Processing and heat treatments affect available properties at various elevated temperatures.

3. COMPOSITION:

Carbon	0.08 max
Manganese	0.30 - 1.00
Silicon	0.50 max
Sulfur	0.01 max
Chromium	14.00 - 16.00
Nickel + Cobalt	70.00 min
Cobalt, if determined	1.00 max
Columbium	0.70 - 1.20
Titanium	2.25 - 2.75
Aluminum	0.40 - 1.00
Iron	5.00 - 9.00
Copper	0.20 max

4. CONDITION: Unless otherwise specified, material shall be supplied cold rolled, annealed, pickled, and leveled.

5. TECHNICAL REQUIREMENTS:

5.1 Properties as received: Material shall conform to the following requirements; tensile test specimens shall be taken with the axis perpendicular to the direction of rolling:

5.1.1 Material having nominal thickness 0.125 in. and under:

Tensile Strength, psi	130,000 max
Yield Strength at 0.2% offset or at 0.0079 inch in 2 in. extension under load, psi	60,000 max
Elongation, % in 2 in.	40 min

5.1.2 Material having nominal thickness over 0.125 in.:

Tensile Strength, psi	130,000 max
Yield Strength at 0.2% offset or at 0.0082 inch in 2 in. extension under load, psi	65,000 max
Elongation, % in 2 in.	40 min

5.1.3 Bending: Material shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the nominal thickness of the material, with axes of bends both perpendicular and parallel to the direction of rolling.

5.2 Properties after Aging: Material shall, after aging at 1300 F ± 10 for 20 hr and air cooling, conform to the following requirements; tensile test specimens shall be taken with the axis perpendicular to the direction of rolling:

Tensile Strength, psi	155,000 min
Yield Strength at 0.2% offset or at 0.0105 inch in 2 in. extension under load, psi	100,000 min
Elongation, % in 2 in.	20 min
Hardness, Rockwell	C 30-37 (Vickers 295-353)

5.3 Grain Size: The grain size shall average not over 0.0057 in. in diameter when determined in accordance with ASTM E2-44T, method a.

6. 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.

7. TOLERANCES: Unless otherwise specified, tolerances for widths 44 in. and under and thicknesses 0.025 in. and over shall conform to the latest issue of AMS 2262 as applicable. Thickness tolerances shall conform to Table I and width tolerances shall conform to 4.1.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of the sheet shall furnish with each shipment three copies of a report of the results of tests for chemical composition and grain size of each heat in the shipment. This report shall include the purchase order 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 shall be marked near one end with AMS 5542B, 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 effects on the material or its performance. The characters shall be sufficiently stable to withstand ordinary handling, and shall not interfere with welding procedures.