AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5540D

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ALLOY SHEET AND STRIP, CORROSION AND HEAT RESISTANT
Nickel Base - 15.5Cr - 8Fe

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

2. FORM: Sheet, strip, and plate.

3. APPLICATION: Parts and assemblies requiring both corrosion and oxidation resistance, and where such parts may require welding during fabrication. Parts and assemblies requiring oxidation resistance up to approximately 2000 F, but useful at the higher temperatures only when stresses are low. Strength at elevated temperatures is similar to that of the 18-8 type of steel.

4. COMPOSITION:

Carbon	0.15 max
Manganese	1.00 max
Silicon	0.50 max
Chromium	14.00 - 17.00
Nickel + Cobalt	72.00 min
Cobalt, if determined	1.00 max
Iron	6.00 - 10.00
Copper	0.50 max

5. CONDITION:

5.1 Sheet and Strip: Cold rolled and annealed and pickled if necessary.

5.2 Plate: Hot rolled, annealed and pickled.

6. TECHNICAL REQUIREMENTS:

6.1 Physical Properties:

Tensile Strength, psi	80,000 - 100,000
Yield Strength at 0.2% offset or at 0.0059 inch in 2 in. extension under load, psi	30,000 min
Elongation, % in 2 in.	40 min

Note 1: Yield strength and elongation requirements do not apply to sheet or strip under 0.020 in. in thickness.

Note 2: 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.

6.2 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.

6.3 Grain Size: The grain size shall conform to the limits shown below when determined in accordance with ASTM E2-44T, Method A:

6.3.1 Sheet: The grain size for sheet 0.050 in. and thinner shall average not over 0.0028 in. in diameter, and for sheet thicker than 0.050 in. shall average not over 0.0040 in. in diameter.

6.3.2 Strip: The grain size for strip 0.125 in. and thinner shall average not over 0.0028 in. in diameter, and for strip thicker than 0.125 in. shall average not over 0.0040 in. in diameter.

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 2262 as applicable. Thickness and width tolerances shall be as specified below except when strip is specifically ordered.

8.1 Thickness: Table I

8.2 Width: 4.1

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 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 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 with AMS 5540D, 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 effects on the material or its performance. The characters shall be sufficiently stable to withstand ordinary handling and shall not interfere with welding procedures.