Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS 5540H
Superseding AMS 5540G
Issued 1-23-40
Revised 5/1/70

ALLOY SHEET, STRIP, AND PLATE, CORROSION AND HEAT RESISTANT
Nickel Base - 15.5Cr - 8.0Fe

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

2. APPLICATION: Parts and assemblies requiring oxidation resistance up to approximately 2000 F (1093 C), but useful at the higher temperatures only when stresses are low, where such parts may require welding during fabrication. Strength at elevated temperatures is similar to that of the 18-8 type of steel.

3. COMPOSITION:

	min	max
Carbon	--	0.15
Manganese	--	1.00
Silicon	--	0.50
Sulfur	--	0.015
Chromium	14.00	17.00
Nickel + Cobalt	72.00	--
Cobalt (1)	--	1.00
Iron	6.00	10.00
Columbium + Tantalum (1)	--	1.00
Titanium (1)	--	0.50
Aluminum (1)	--	0.35
Copper	--	0.50

(1) Determination not required for routine acceptance.

3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2269.

4. CONDITION: Unless otherwise ordered, the product shall be supplied in the following condition:

Ø 4.1 Sheet and Strip: Cold rolled, annealed, and descaled; or cold rolled and bright annealed.

4.2 Plate: Hot rolled, annealed, and descaled.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties:

	Tensile Strength, psi	80,000 min
Ø	Yield Strength at 0.2% Offset or at 0.0063 in. in 2 in. Extension Under Load (E = 31,000,000), psi	35,000 min
	Elongation, % in 2 in. or 4D	30 min

5.1.1 Yield strength does not apply to sheet or strip under 0.020 in. in thickness.

Ø 5.1.2 Elongation requirement does not apply to material under 0.010 in. in thickness.

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5.1.3 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.

5.2 Bending: Material shall withstand, without cracking, bending at room temperature through an angle of ø 180 deg around a diameter equal to the bend factor times the nominal thickness of the material, with axis of bend parallel to the direction of rolling:

Nominal Thickness Inch	Bend Factor
0.010 to 0.050, incl	1
Over 0.050 to 0.250, incl	2

5.3 Grain Size: Shall be not larger than the following when determined in accordance with the issue of ASTM E112 listed in the latest issue of AMS 2350:

Form	Nominal Thickness Inch	Average Grain Diam Inch	ASTM Grain Size No.
Sheet	Up to 0.050, incl	0.0030	4.5
	Over 0.050 to 0.250, incl	0.0040	3.5
Strip	Up to 0.125, incl	0.0030	4.5

6. 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.

ø 7. SAMPLING: Shall be in accordance with all applicable requirements of AMS 2371 and as specified herein.

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2262.

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 and its revision letter, 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 and its revision letter, 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 on one face, in the respective location indicated below, with AMS 5540H, heat number, manufacturer's identification, ø and nominal thickness in inches. The characters shall be of such size as to be clearly legible, 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 and shall be sufficiently stable to withstand normal handling.