AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 5542G

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ALLOY SHEET, STRIP, AND PLATE, CORROSION AND HEAT RESISTANT
Nickel Base - 15.5Cr - 2.5Ti - 1(Cb+Ta) - 0.7Al - 7Fe

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

2. APPLICATION: Primarily for parts requiring high strength up to 1500 F and oxidation resistance up to 1800 F, and for bellows and flat springs requiring optimum resistance to relaxation up to 1000 F with moderate or relatively low stresses. Parts may be formed and then heat treated to improve strength at elevated temperatures.

3. COMPOSITION:

Carbon	0.08 max
Manganese	1.0 max
Silicon	0.50 max
Sulfur	0.01 max
Chromium	14.0 - 17.0
Nickel + Cobalt	70.0 min
Cobalt, if determined	1.0 max
Columbium + Tantalum	0.7 - 1.2
Titanium	2.25 - 2.75
Aluminum	0.40 - 1.0
Iron	5.0 - 9.0
Copper	0.50 max

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

4. CONDITION:

4.1 Sheet: Cold rolled, annealed, descaled, and leveled as flat as possible.

4.2 Strip: Cold rolled and annealed. Strip need not be bright and may have an oxidized surface.

4.3 Plate: Hot rolled, annealed, and descaled, unless otherwise specified.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties:

5.1.1 Strip:

Nominal Thickness Inch	Tensile Strength psi, max	Elongation % in 2 in., min
Under 0.010	140,000	--
0.010 to 0.025, excl	130,000	20
0.025 and over	As agreed upon by purchaser and vendor	

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5.1.2 Sheet:

Nominal Thickness Inch	Tensile Strength psi, max	Yield Strength at 0.2% Offset or at Extension Indicated (E = 31,000,000) psi, max	Extension Under Load in. in 2 in.	Elongation % in 2 in. min
0.010 to 0.024, incl	140,000	--	---	30
Over 0.024 to 0.125, incl	130,000	60,000	0.0079	40
Over 0.125 to 0.250, incl	130,000	65,000	0.0082	40

5.1.3 For sheet in widths 9 in. and over, tensile test specimens shall be taken with the axis perpendicular to the direction of rolling. For all strip and for sheet in widths less than 9 in., tensile test specimens shall be taken with the axis parallel to the direction of rolling.

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

5.3 Grain Size: Grain size of sheet and strip 0.010 in. and over in thickness shall average not over 0.0060 in. in diameter (Grain Size No. 2.5) when determined in accordance with ASTM E112-60T.

5.4 Properties After Precipitation Heat Treatment: Material shall conform to the following requirements after being precipitation heat treated by heating to 1300 F ± 25, holding at heat for 20 hr, and cooling in air:

5.4.1 Tensile Properties:

Product	Nominal Thickness Inch	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated, Min (E = 31,000,000) psi, min	Extension Under Load in. in 2 in.	Elongation % in 2 in., min
Strip	Under 0.010	150,000	--	--	--
	0.010 to 0.025, excl	155,000	--	--	15
	0.025 and over	155,000	--	--	15
Sheet	0.010 to 0.250, incl	165,000	105,000	0.0108	20
Plate	0.187 to 4.000, excl	155,000	100,000	0.0105	20

5.4.1.1 Elongation requirements do not apply to strip under 0.020 in. in thickness.

5.4.1.2 For sheet and plate in widths 9 in. and over, tensile test specimens shall be taken with the axis perpendicular to the direction of rolling. For all strip and for sheet and plate in widths less than 9 in., tensile test specimens shall be taken with the axis parallel to the direction of rolling.

5.4.2 Hardness: Strip 0.005 in. and over in thickness, and plate shall have hardness not lower than Rockwell C 30 or equivalent; sheet shall have hardness not lower than Rockwell C 32 or equivalent.