SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York, N.Y. 10017

AEROSPACE MATERIAL SPECIFICATIONS

AMS 5536E
Superseding AMS 5536D
Issued 5-1-54
Revised 9-30-66

ALLOY SHEET AND PLATE, CORROSION AND HEAT RESISTANT
Nickel Base - 22Cr - 1.5Co - 9.0Mo - 0.60W - 18.5Fe

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 such as welded nozzle diaphragm assemblies, burner liner parts, tail pipes, exhaust cone assemblies, and other parts requiring oxidation resistance up to 2200 F (1204 C) and relatively high strength above 1500 F (816 C).

3. COMPOSITION:

	min	max
Carbon	0.05	0.15
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	20.50	23.00
Cobalt	0.50	2.50
Molybdenum	8.00	10.00
Tungsten	0.20	1.00
Iron	17.00	20.00
Nickel	remainder	

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

4. CONDITION: Unless otherwise specified, material shall be supplied in the following condition:

4.1 Sheet: Hot or cold rolled, solution heat treated, and descaled unless solution heat treatment is performed in an atmosphere yielding a bright finish, having a surface appearance as close as possible to a commercial corrosion resistant steel No. 1 finish; actual acceptance and rejection standards shall be as agreed upon by purchaser and vendor.

4.2 Plate: Hot rolled, solution heat treated, and descaled.

5. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

5.1 Heat Treatment: Unless otherwise specified, material shall be solution heat treated by heating to 2150 F ± 25 (1176.7 C ± 14), holding at heat for a time commensurate with the thickness, and rapidly cooling.

5.2 Tensile Properties:

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 30,000,000) psi, min	Extension Under Load in. in 2 in.	Elongation % in 2 in. or 4D, min
Up to 0.187, incl	100,000	45,000	0.0070	35
Over 0.187 to 2.000, incl	100,000	40,000	0.0067	35
Over 2.000	95,000	40,000	0.0067	35

5.2.1 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.

5.3 Bending: Material shall withstand, without cracking, bending at room temperature through an angle of 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
Up to 0.050, excl	1.5
0.050 to 0.187, incl	2

5.4 Stress-Rupture Test at 1500 F (815.6 C): Material shall be capable of meeting the following requirements; tests shall be conducted in accordance with ASTM E139.

5.4.1 A tensile test specimen, maintained at 1500 F ± 5 (815 6 C ± 2.8) while an axial stress of 15,000 psi is applied continuously, shall not rupture in less than 24 hours. The test shall be continued, after the 24 hr, until the specimen ruptures. The elongation after rupture, measured at room temperature, shall be not less than 8% in 2 inches.

5.4.1.1 The test of 5.4.1 may be conducted at a stress higher than 15,000 psi but stress shall not be changed while test is in process, unless otherwise specified or allowed. Time to rupture and elongation requirements shall be as specified in 5.4.1.

5.5 Grain Size: Sheet 0.125 in. and under in thickness shall have average grain size of 4 or finer, determined in accordance with ASTM E112.

6. QUALITY: The product 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.

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

8. REPORTS:

8.1 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 lot to determine conformance to the tensile and bending requirements of this specification. This report shall include the purchase order number, lot number, material specification number, nominal thickness, size, and quantity from each lot. A lot shall be considered to be any number of individual furnace heats of approximately the same composition which are processed as a unit.