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

AEROSPACE MATERIAL SPECIFICATION

AMS 5595

Issued 11-1-68
Revised

STEEL SHEET, STRIP, AND PLATE, CORROSION RESISTANT
9.0Mn - 20Cr - 6.5Ni - 0.27N

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

2. APPLICATION: Primarily for parts requiring high strength and corrosion resistance from -423 F (-253 C) up to 1100 F (593 C) and where parts require welding during fabrication.

3. COMPOSITION:

	min	max
Carbon	--	0.04
Manganese	8.00	10.00
Silicon	--	1.00
Phosphorus	--	0.060
Sulfur	--	0.030
Chromium	19.00	21.50
Nickel	5.50	7.50
Nitrogen	0.15	0.40

3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248.

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

4.1 Sheet: Cold rolled, solution heat treated as in 5.1, and descaled (No. 2D Finish).

4.2 Strip: Cold rolled and solution heat treated as in 5.1 (No. 1 Strip Finish).

4.3 Plate: Hot rolled, solution heat treated as in 5.1, 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: The product shall be solution heat treated by heating to 1950 F ± 25 (1065.6 ± 14), holding at heat for a time commensurate with section thickness, and cooling at a rate equivalent to rapid air cool or faster.

5.2 Tensile Properties:

Nominal Thickness Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 28,800,000) psi, min	Extension Under Load in. in 2 in.	Elongation % in 2 in. or 4D, min
Up to 0.1875, excl	100,000	60,000	0.0082	40
0.1875 and over	90,000	50,000	0.0075	40

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 the angle indicated below 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	Type of Bend	Degrees, min	Factor
Up to 0.249, incl	Free Bend	180	1
Up to 0.249, incl	V-Block	135	1
Over 0.249 to 0.749, incl	Free Bend	90	1
Over 0.249 to 0.749, incl	V-Block	135	2

5.4 Hardness: Shall be not higher than Rockwell B 100 or equivalent.

5.5 Grain Size: Shall be predominantly 7 or finer as determined by comparison of a polished and etched specimen with the chart in ASTM E112.

5.6 Embrittlement: The material shall be capable of meeting the following test:

5.6.1 Two specimens, after being heated at 1250 F ± 10 (676.7 C ± 5.6) for 1 hr and air cooled, shall be subjected to the acidified copper sulfate test specified in ASTM A393, without evidence of intercrystalline surface attack.

5.6.2 After immersion as in 5.6.1, the specimens shall withstand, without cracking, bending at room temperature through the angle indicated below around a diameter equal to the nominal thickness of the material, with axes of bends both perpendicular and parallel to the direction of rolling.

Nominal Thickness Inch	Angle Degrees, min	Bend Factor
Up to 0.249, incl	180	1
Over 0.249 to 0.749, incl	90	1

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 2242.

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 heat to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, heat 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 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.