AMS 5592

# ADOPTlON NOTICE

AMS 5592, “Steel, Corrosion and Heat Resistant, Sheet, Strip, and Plate 18.5Cr - 35Ni - 1.15Si Solution Heat Treated” was adopted on 10 January 1994 for use by the Department of Defense (DoD). Proposed changes by DoD activities must be submitted to the DoD Adopting Activity: ASC/ENOSD, Building 125 2335 Seventh Street, Suite 6, Wright-Patterson AFB OH 45433-7809. DoD activities may obtain copies of this standard from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, PhiIadelphia, PA 19111-5094. The private sector and other Government agencies may purchase copies from the Society of Automotive Engineers Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001.

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(Proj No. 9515-1014 )



FSC 9515

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# AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5592D

Issued JUL 1963
Revised APR 1996

Submitted for recognition as an American National Standard

Superseding AMS 5592C

## IRON-NICKEL ALLOY, CORROSION AND HEAT RESISTANT, SHEET, STRIP, AND PLATE
44Fe - 18.5Cr - 35Ni - 1.15Si
Solution Heat Treated

UNS NO8330



1. SCOPE:

1.1 Form:

This specification covers a corrosion and heat resistant iron-nickel alloy in the form of sheet, strip, and plate.

1.2 Application:

These products have been used typically for parts requiring heat and oxidation resistance up to 2150 °F (1177 °C), but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

| | |
|---|---|
| AMS 2242 | Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate |
| MAM 2242 | Tolerances, Metric, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate |
| AMS 2248 | Chemical Check Analysis Limits, Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys |
| AMS 2371 | Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock |
| AMS 2807 | Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing |

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM E 3 Preparation of Metallographic Specimens
ASTM E 8 Tension Testing of Metallic Materials
ASTM E 8M Tension Testing of Metallic Materials (Metric)
ASTM E 18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-163 Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

| Element | min | max |
|---|---|---|
| Carbon | -- | 0.08 |
| Manganese | -- | 2.00 |
| Silicon | 0.75 | 1.50 |
| Phosphorus | -- | 0.030 |
| Sulfur | -- | 0.030 |
| Chromium | 17.00 | 20.00 |
| Nickel | 34.00 | 37.00 |
| Copper | -- | 0.75 |
| Tin | -- | 0.025 |
| Lead | -- | 0.005 |
| Iron | remainder | |

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2248.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Sheet and Strip: Hot or cold rolled, solution heat treated, and, unless solution heat treatment is performed in an atmosphere yielding a bright finish, descaled having a surface appearance comparable to the following commercial corrosion-resistant steel finishes, as applicable (See 8.2).

3.2.1.1 Sheet: No. 2D finish.

3.2.1.2 Strip: No. 1 strip finish.

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

3.3 Properties:

The product shall conform to the following requirements:

3.3.1 (R) Tensile Properties: Shall be as shown in Table 2, determined in accordance with ASTM E 8 or ASTM E 8M.

TABLE 2 - Minimum Tensile Properties

| Property | Value |
|---|---|
| Tensile Strength | 70.0 ksi (483 MPa) |
| Yield Strength at 0.2% Offset | 30.0 ksi (207 MPa) |
| Elongation in 2 Inches (50.8 mm) or 4D | 30% |

3.3.1.1 Elongation requirement does not apply to sheet or strip under 0.020 inch (0.51 mm) in nominal thickness.

3.3.2 (R) Hardness: Shall be not higher than 95 HRB, or equivalent (See 8.3), determined in accordance with ASTM E 18.

3.3.3 Microstructure: Shall be free from continuous carbide network, determined by metallographic examination of specimens prepared in accordance with ASTM E 3.

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances:

Shall conform to all applicable requirements of AMS 2242 or MAM 2242.