SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS5652 REV. H

Issued 1947-09
Reaffirmed 2006-04
Revised 2010-05

Superseding AMS5652G

Steel, Corrosion and Heat Resistant, Bars, Wire, Forgings, Tubing, and Rings
25Cr - 20Ni - 2.0Si (SAE 30314)
Solution Heat Treated

(Composition similar to UNS S31400)

RATIONALE

AMS5652H revises condition of bars (3.2.1.1.1), reporting requirements (4.4) and results from a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers a corrosion and heat resistant steel in the form of bars, wire, forgings, mechanical tubing, flash welded rings, and stock for forging or flash welded rings.

1.2 Application

These products have been used typically for parts requiring good corrosion resistance and which will be subjected to elevated temperatures during fabrication or in service and for parts requiring oxidation resistance up to 2000 °F (1093 °C) but useful at the higher temperatures only when stresses are low, but usage is not limited to such applications.

1.2.1 Strength at elevated temperatures is similar to that of the 18-8 type steels. The specified silicon content improves oxidation resistance with some sacrifice of weldability and ductility.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS2241 Tolerances, Corrosion and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
AMS2243 Tolerances, Corrosion and Heat-Resistant Steel Tubing

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

AMS2248 Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS2371 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS2374 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steel and Alloy Forgings
AMS2806 Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat-Resistant Steels and Alloys
AMS2808 Identification, Forgings
AMS7490 Rings, Flash Welded, Corrosion and Heat-Resistant Austenitic Steels, Austenitic-Type Iron, Nickel, or Cobalt Alloys, or Precipitation-Hardenable Alloys

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A 370 Mechanical Testing of Steel Products
ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

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	1.00	2.00
Silicon	1.50	2.30
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	23.00	25.00
Nickel	19.00	22.00
Molybdenum	--	0.75
Copper	--	0.75

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Condition

The product shall be supplied in the following condition:

3.2.1 Bars, Wire, Forgings, Mechanical Tubing, and Flash Welded Rings

Solution heat treated free from continuous carbide network, and as follows:

3.2.1.1 Bars

3.2.1.1.1 Bars 2.75 inches (69.8 mm) and under in nominal diameter, or least distance between parallel sides, and all hexagons, shall be cold finished or hot finished.

3.2.1.1.2 Bars, other than hexagons, over 2.75 inches (69.85 mm) in nominal diameter, or least distance between parallel sides, shall be hot finished and descaled.

3.2.1.2 Mechanical Tubing

Shall be cold finished.

3.2.1.3 Flash Welded Rings

Shall not be supplied unless specified or permitted on purchaser's part drawing. When supplied, rings shall be manufactured in accordance with AMS7490.

3.2.1.4 Wire

Shall be cold finished.

3.2.2 Stock for Forging or Flash Welded Rings

As ordered by the forging or flash welded ring manufacturer.

3.2.3 Forgings

Solution heat treated and descaled since there is no reference to how forgings are supplied.

3.3 Properties

3.3.1 Bars, Wire, Forgings, Tubing and Rings:

The product shall conform to the following requirements; hardness and tensile testing shall be performed in accordance with ASTM A 370:

3.3.1.1 Hardness

3.3.1.1.1 Bars

Not higher than 187 HB, or equivalent (See 8.2), determined approximately midway between surface and center, except that if supplied cold finished, hardness may be as high as 229 HB, or equivalent (See 8.2).

3.3.1.1.2 Forgings and Flash Welded Rings

Not higher than 187 HB, or equivalent (See 8.2).

3.3.1.1.3 Mechanical Tubing

Not higher than 90 HRB, or equivalent (See 8.2), determined approximately midway between outer and inner surfaces.

3.3.1.2 Tensile Properties

Wire shall have tensile strength not higher than 125 ksi (862 MPa).

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

3.5.1 Bars and Wire

In accordance with AMS2241.

3.5.2 Mechanical Tubing

In accordance with AMS2243.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests

All technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing

4.3.1 Bars, Wire, Mechanical Tubing, Flash Welded Rings, and Stock for Forging or Flash Welded Rings

In accordance with AMS2371.

4.3.2 Forgings

In accordance with AMS2374.

4.4 Reports

4.4.1 The vendor of bar, wire, forgings, tubing and rings shall furnish with each shipment a report showing the results of tests for composition of each heat, and for tensile properties or hardness, as applicable, of each lot, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS5652H, product form, size, and quantity. If forgings are supplied, the size and melt source of stock used to make the forgings shall also be included.

4.4.2 The vendor of forging stock shall furnish with each shipment a report showing the results of tests for composition for each heat. This report shall include the purchase order number, heat number, AMS5652H, product form, size, and quantity.

4.5 Resampling and Retesting

4.5.1 Bars, Wire, Mechanical Tubing, Flash Welded Rings, and Stock for Forging or Flash Welded Rings

In accordance with AMS2371.

4.5.2 Forgings

In accordance with AMS2374.