AEROSPACE MATERIAL SPECIFICATION

AMS5764™	REV. F

Issued 1971-11
Reaffirmed 2014-10
Revised 2020-05

Superseding AMS5764E

Steel, Corrosion-Resistant, Bars, Wire, Forgings, Extrusions, and Rings
5.0Mn - 22Cr - 12.5Ni - 2.2Mo - 0.20Cb - 0.30N - 0.20V
Solution Heat Treated
(Composition similar to UNS S20910)

RATIONALE

AMS5764F prohibits unauthorized exceptions (3.8), revises Composition (3.1) to replace obsolete chemical analysis standards, Condition (3.2.1.4), Reports (4.4) and Identification (5.2.1.1), and results from a Five-Year Review and update of this specification.

1. SCOPE

1.1 Form

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

1.2 Application

These products have been used typically for parts requiring excellent corrosion resistance and high strength from -423 to +1100 °F (-253 to +593 °C) and for welded parts without subsequent heat treatment, but usage is not limited to such applications.

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 +1 724-776-4970 (outside USA), www.sae.org.

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

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

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS5764F/

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 and Austenitic-Type Iron, Nickel, or Cobalt Alloys, or Precipitation-Hardenable Alloys

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

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 A262 Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

ASTM A370 Mechanical Testing of Steel Products

ASTM A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

ASTM E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751, or by other analytical methods acceptable to purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	--	0.06
Manganese	4.00	6.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	20.50	23.50
Nickel	11.50	13.50
Molybdenum	1.50	3.00
Columbium	0.10	0.30
Vanadium	0.10	0.30
Nitrogen	0.20	0.40

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

3.2.1.1 Round, Rectangular, and Square Bars

Solution heat treated, and hot-finished or cold-finished.

3.2.1.2 Hexagons

Solution heat treated, descaled, and cold drawn.

3.2.1.3 Bars shall not be cut from plate (also see 4.4.4).

3.2.2 Wire

Solution heat treated, cold drawn, or centerless ground.

3.2.3 Forgings and Flash Welded Rings

Solution heat treated and descaled.

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

3.2.4 Extrusions

Solution heat treated, straightened, and descaled.

3.2.5 Stock for Forging, Extruding, or Flash Welded Rings

As ordered by the forging, extrusion, or flash welded ring manufacturer.

3.3 Heat Treatment

Bars, wire, forgings, extrusions, and flash welded rings shall be solution heat treated by heating within the range 1925 to 1975 °F (1052 to 1079 °C), holding at heat for a time commensurate with section thickness, and cooling at a rate equivalent to a forced air cool or faster.

3.4 Properties

The product shall conform to the following requirements; hardness and tensile testing shall be performed in accordance with ASTM A370:

3.4.1 Bars, Wire, Forgings, Extrusions, and Flash Welded Rings

3.4.1.1 Tensile Properties

Shall be as shown in Table 2.

Table 2 - Minimum tensile properties

Property	Value
Tensile Strength	100 ksi (690 MPa)
Yield Strength at 0.2% Offset	55 ksi (379 MPa)
Elongation in 4D	35%
Reduction of Area	55%

3.4.1.2 Hardness

Shall be not lower than 20 HRC, or equivalent (see 8.2). Product shall not be rejected on the basis of hardness if the tensile property requirements of 3.4.1.1 are acceptable, determined on specimens taken from the same sample as that with nonconforming hardness or from another sample with similar nonconforming hardness.

3.4.1.3 Susceptibility to Intergranular Attack

Specimens from the product shall pass the copper/copper sulfate/sulfuric acid test performed in accordance with ASTM A262, Practice E.

3.4.2 Stock for Forging, Extruding, or Flash Welded Rings

Shall have properties as agreed upon by purchaser and producer.

3.5 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.

3.5.1 Grain flow of die forgings, except in areas which contain flash-line end grain, shall follow the general contour of the forging showing no evidence of reentrant grain flow.

3.6 Tolerances

Bars and wire shall conform to all applicable requirements of AMS2241.

3.7 Exceptions

Any exception shall be authorized by purchaser and reported as in 4.4.3.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for producer'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

4.2.1 Acceptance Tests

The following requirements are acceptance tests and shall be performed on each heat or lot as applicable:

4.2.1.1 Composition (3.1) of each heat.

4.2.1.2 Tensile properties (3.4.1.1) and hardness (3.4.1.2) of each lot of bars, wire, forgings, extrusions, and flash welded rings.

4.2.1.3 Tolerances (3.6) of bars and wire.

4.2.2 Periodic Tests

Susceptibility to intergranular attack (3.4.1.3), tests of forging stock and of stock for extruding or flash welded rings (3.4.2) to demonstrate ability to develop required properties, and grain flow of die forgings (3.5.1) are periodic tests and shall be performed at a frequency selected by the producer unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be as follows:

4.3.1 Bars, Wire, Extrusions, Flash Welded Rings, and Stock for Forging, Extruding, or Flash Welded Rings

In accordance with AMS2371.

4.3.2 Forgings

In accordance with AMS2374.

4.4 Reports

The producer of the product shall furnish with each shipment a report showing the producer's name and country where the metal was melted (e.g., final melt in the case of metal processed by multiple melting operations) and the following results of tests and relevant information:

4.4.1 For each heat:

Composition

4.4.2 For each lot of bars, wire, forgings, extrusions, and rings:

Tensile properties
Hardness

4.4.3 When material produced to this specification has exceptions authorized by purchaser taken to the technical requirements listed in Section 3 (see 5.2.1.1), the report shall contain a statement "This material is certified as AMS5764F(EXC) because of the following exceptions:" and the specific exceptions shall be listed.

4.4.4 If the size being shipped is different from the nominal metallurgically-worked cross-sectional size, the size of the larger product and details of how the shipped size was extracted from the larger product shall be reported (also see 3.2.1.3).

4.4.5 A statement that the product conforms to the other technical requirements.

4.4.6 Purchase order number
Heat and lot numbers
AMS5764F
Size
Quantity

4.4.7 If forgings are supplied, the size and melt source of stock used to make the forgings.

4.4.8 The producer of stock for forgings shall furnish with each shipment a report showing the producer's name and country where the metal was melted (e.g., final melt in the case of metal processed by multiple melting operations), and the composition of each heat. This report shall include the purchase order number, heat number, AMS5764F, product form, size, and quantity. The producer shall provide a copy of the original material manufacturer's (producer's) report (material certification), including: producer's name and country where the metal was melted (e.g., the final melt in the case of metal processed by multiple melting operations).