AEROSPACE MATERIAL SPECIFICATION

AMS5686™	REV. J

Issued 1945-05
Reaffirmed 2012-10
Revised 2024-06

Superseding AMS5686H

Steel, Corrosion-Resistant, Rivet Wire, 18Cr - 11.5Ni (SAE 305) Solution Heat Treated

(Composition similar to UNS S30500)

RATIONALE

AMS5686H is the result of a Five-Year Review and update of the specification. The revision updates composition testing and reporting (see 3.1 and 3.1.2), revises the specification for tensile testing (see 3.3.1), and updates the exceptions requirements (see 8.4).

1. SCOPE

1.1 Form

This specification covers a corrosion-resistant steel in the form of wire.

1.2 Application

This wire has been used typically for fabricating into rivets, but usage is not limited to that application.

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

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/AMS5686J

AMS2371 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock

AS7766 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 A370 Mechanical Testing of Steel Products

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

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

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

Table 1 - Composition

Element	Min	Max
Carbon	--	0.08
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	17.00	19.00
Nickel	10.00	13.00
Molybdenum	--	0.75
Copper	--	0.75

3.1.1 Chemical analysis of initial ingot, bar, or rod stock before drawing is acceptable provided the processes used for drawing or rolling, annealing, and cleaning, are controlled to ensure continued conformance to chemical composition requirements.

3.1.2 The producer may test for any element not listed in Table 1 and include this analysis in the report of 4.4. Reporting of any element not listed in the composition table is not a basis for rejection unless limits of acceptability are specified by the purchaser.

3.1.3 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Condition

Wire shall be solution heat treated, bright pickled, and coated with a lubricant suitable for fabricating rivets.

3.3 Properties

Wire shall conform to the following requirements:

3.3.1 Tensile Strength

Tensile strength shall be not higher than 110 ksi (758 MPa), determined in accordance with ASTM A370.

3.3.2 Bending

Wire shall withstand, without cracking, bending at room temperature flat on itself. Cracking or spalling of the lubricant coating is acceptable.

3.4 Quality

3.4.1 Wire, prior to coating, shall be uniform in quality and condition, cylindrical, clean, and free from kinks, twists, scrapes, splits, cold shuts, and other imperfections detrimental to usage of the wire.

3.4.2 The surface of the wire, prior to application of the lubricant coating, shall have a bright, smooth finish, free from pits, abrasions, and other defects.

3.4.3 The lubricant coating shall be uniform and capable of withstanding rubbing, abrasion, and shock of normal handling during shipment, storage, and use.

3.5 Tolerances

Wire shall conform to all applicable tolerance requirements of AMS2241 except that wire 0.281 inch (7.1 mm) and under in nominal diameter shall, before lubricant coating, not vary in diameter more than 0.001 inch (0.025 mm) from the size ordered.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of wire shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the wire 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

Sampling and testing shall be in accordance with AMS2371.

4.4 Reports

The producer of wire shall furnish with each shipment a report showing the producer’s name, country where the metal was melted (e.g., final melt in the case of metal processed by multiple melting operations), results of tests for chemical composition of each heat and for tensile and bending properties 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, AMS5686J, nominal size, and quantity.

4.4.1 When material produced to this specification has exceptions taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement “This material is certified as AMS5686J(EXC) because of the following exceptions:” and the specific exceptions shall be listed.

4.5 Resampling and Retesting

Resampling and retesting shall be in accordance with AMS2371.

5. PREPARATION FOR DELIVERY

5.1 Identification

Coils or reels of wire shall each be identified by a durable tag marked with not less than the purchase order number, AMS5686J, heat and lot numbers, nominal size, quantity, and the manufacturer's identification.

5.1.1 When technical exceptions are taken (see 4.4.1), the material shall be marked with AMS5686J(EXC).

5.2 Packaging

5.2.1 Wire shall be furnished in coils. Each coil shall be of one continuous length, properly coiled, and firmly tied.

5.2.2 Wire shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the wire to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A producer shall mention this specification number and its revision letter in all quotations and when acknowledging purchaser orders.

7. REJECTIONS

Wire not conforming to this specification, or to modifications authorized by the purchaser, will be subject to rejection.

8. NOTES

8.1 Revision Indicator

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.3 Unless otherwise specified, the material producer shall work to the revision of this specification (AMS5686) in effect on the date of order placement. Unless otherwise specified, material manufactured and certified to the immediately previous revision of this specification (AMS5686) may be procured and used until inventory is depleted.

8.4 It is the purchaser’s obligation to ensure that product they procure or resell as AMS5686J has any exceptions approved by their subsequent purchaser.