



AEROSPACE MATERIAL SPECIFICATION

AMS5726™

REV. E

Issued 1977-01
Revised 2008-11
Reaffirmed 2015-12

Superseding AMS5726D

Steel, Corrosion and Heat-Resistant, Bars and Wire
15Cr - 25.5Ni - 1.2Mo - 2.1Ti - 0.006B - 0.30V
1800 °F (982 °C) Solution Heat Treated and Work-Strengthened
Consumable Electrode Remelted
200 ksi (1379 MPa) Tensile Strength Capability
(Composition similar to UNS S66286)

RATIONALE

AMS5726E has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE

1.1 Form

This specification covers a corrosion and heat-resistant steel in the form of work-strengthened bars and wire 1-1/4 inches (31.8 mm) and under in nominal diameter or least distance between parallel sides.

1.2 Application

These products have been used typically for parts, such as fasteners, requiring room-temperature minimum tensile strength of 200 ksi (1379 MPa) after precipitation heat treatment for use up to 1000 °F (538 °C) and having oxidation resistance up to 1200 °F (649 °C), 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.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2015 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

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>

SAE values your input. To provide feedback
on this Technical Report, please visit
<http://www.sae.org/technical/standards/AMS5726E>

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), or 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 Products and Forging Stock
AMS2750	Pyrometry
AMS2806	Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Corrosion and Heat-Resistant Steels and 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, or www.astm.org.

ASTM A 370	Mechanical Testing of Steel Products
ASTM E 112	Determining Average Grain Size
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	--	2.00
Silicon	--	1.00
Phosphorus	--	0.025
Sulfur	--	0.025
Chromium	13.50	16.00
Nickel	24.00	27.00
Molybdenum	1.00	1.50
Titanium	1.90	2.35
Boron	0.003	0.010
Vanadium	0.10	0.50
Cobalt	--	1.00
Aluminum	--	0.35

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Melting Practice

Steel shall be produced by multiple melting using consumable electrode practice in the remelt cycle.

3.3 Condition

Solution heat treated and suitably work-strengthened.

3.3.1 Bars shall be cold finished; round bars shall be ground or turned.

3.3.2 Coiled bars and wire shall be cold-drawn.

3.4 Heat Treatment

Bars and wire, except as specified in 3.4.1, shall be solution heat treated by heating to 1800 °F ± 25 (982 °C ± 14), holding at heat for a time commensurate with section thickness, and quenching in oil or water and work-strengthened as required to meet the requirements of 3.5. Pyrometry shall be in accordance with AMS2750.

3.4.1 Continuous Heat Treating of Wire: Process parameters (e.g., furnace temperature set points, heat input, travel rate, etc.) for continuous heat treating lines shall be established by the material producer and validated by testing of product to the other requirements of this specification.

3.5 Properties

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

3.5.1 As Solution Heat Treated and Work-Strengthened

3.5.1.1 Tensile Strength

Shall be not lower than 125 ksi (862 MPa).

3.5.1.2 Average Grain Size

Shall be ASTM No. 5 or finer, determined in accordance with ASTM E 112.

3.5.2 After Precipitation Heat Treatment

Product, 1-1/4 inches (31.8 mm) and under in nominal diameter or least distance between parallel sides, shall have the following properties after being precipitation heat treated by heating to a temperature within the range 1200 to 1300 °F (649 to 704 °C), holding at the selected temperature within ±25 °F (±14 °C) for not less than 8 hours, and cooling in air:

3.5.2.1 Tensile Properties

Shall be as shown in Table 2.

TABLE 2 - MINIMUM TENSILE PROPERTIES

Property	Value
Tensile Strength	200 ksi (1379 MPa)
Yield Strength at 0.2% Offset	180 ksi (1241 MPa)
Elongation in 4D	8%
Reduction of Area	15%

3.5.2.2 Hardness

Shall be not lower than 40 HRC, or equivalent (See 8.2), but the product shall not be rejected on the basis of hardness if the tensile properties of 3.5.2.1 are acceptable, determined on specimens taken from the same sample as that with nonconforming hardness or from another sample with similar nonconforming hardness.

3.6 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.

3.7 Tolerances

Shall conform to all applicable requirements of AMS2241.

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

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

4.3 Sampling and Testing

Shall be in accordance with AMS2371.

4.4 Reports

The vendor of bars and wire shall furnish with each shipment a report showing the results of tests for composition of each heat and for tensile properties and average grain size of each lot solution heat treated and work strengthened, and for tensile properties and hardness of each lot precipitation heat treated, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, specific heat treatment temperature used to obtain reported properties, AMS5726E, size, and quantity.

4.5 Resampling and Retesting

Shall be in accordance with AMS2371.

5. PREPARATION FOR DELIVERY

5.1 Sizes

Except when exact lengths or multiples of exact lengths are ordered, straight bars and wire will be acceptable in mill lengths of 6 to 20 feet (1.8 to 6.1 m) but not more than 10% of any shipment shall be supplied in lengths shorter than 10 feet (3 m).

5.2 Identification

Shall be in accordance with AMS2806.

5.3 Packaging

The product 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 product to ensure carrier acceptance and safe delivery.