

**AEROSPACE
MATERIAL
SPECIFICATION**

AMS 5726D

Issued JAN 1977
Revised AUG 2006

Superseding AMS 5726C

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 Melted
200 ksi (1379 MPa) Tensile Strength

(Composition similar to UNS S66286)

RATIONALE

AMS 5726D is a Five Year Review and update of this specification that includes a revision to the as-shipped minimum tensile strength.

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.

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.

AMS 2241	Tolerances, Corrosion and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
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

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SAE WEB ADDRESS:

AMS 2750 Pyrometry
 AMS 2806 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 AMS 2248.

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 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 AMS 2750.

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 AMS 2241.

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 AMS 2371.

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, AMS 5726D, size, and quantity.

4.5 Resampling and Retesting

Shall be in accordance with AMS 2371.

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 AMS 2806.

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.

6. ACKNOWLEDGMENT

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

7. REJECTIONS

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

8. NOTES

8.1 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 specification. An (R) symbol to the left of the document title indicates a complete revision of the specification, including technical revisions. Change bars and (R) are not used in original publications, nor in specifications that contain editorial changes only.

8.2 Hardness conversion tables for metals are presented in ASTM E 140.

8.3 Terms used in AMS are clarified in ARP1917.

8.4 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.