



<b>AEROSPACE MATERIAL SPECIFICATION</b>	<b>AMS5627™</b>	<b>REV. J</b>
	Issued 1952-02 Reaffirmed 2013-07 Revised 2024-04	
Superseding AMS5627H		
Steel, Corrosion- and Heat-Resistant, Bars, Wire, Forgings, Mechanical Tubing, Rings, and Stock for Forgings and Flash-Welded Rings 17Cr (430), Annealed (Composition similar to UNS S43000)		

RATIONALE

AMS5627J is the result of a Five-Year Review and update of the specification. The revision updates composition reporting (see 3.1.1), aligns bar size and finish with similar specifications (see 3.2.1), adds quality requirements for bar (see 3.4.2 and 8.5), updates the prohibition of exceptions requirements (see 4.4.2, 4.4.3, and 8.7), and adds the option for additional forging stock properties (see 4.4.4 and 8.8).

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 oxidation resistance up to 1600 °F (871 °C) but useful at the higher temperatures only when strength requirements are moderately low, 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.

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<https://www.sae.org/standards/content/AMS5627J/>

## 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](http://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
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
AMS7493	Rings, Flash Welded, Ferritic and Martensitic Corrosion-Resistant Steels
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](http://www.astm.org).

ASTM A370	Mechanical Testing of Steel Products
ASTM A751	Chemical Analysis of Steel Products
ASTM E112	Determining Average Grain Size
ASTM E140	Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

## 2.3 Definitions

Terms used in AMS are defined in AS7766.

## 3. TECHNICAL REQUIREMENTS

### 3.1 Composition

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 the purchaser.

**Table 1 - Composition**

Element	Min	Max
Carbon	--	0.12
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	16.00	18.00
Nickel	--	0.75
Molybdenum	--	0.50
Copper	--	0.50
Aluminum	--	0.05
Tin	--	0.05

3.1.1 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.

### 3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

### 3.2 Condition

The product shall be supplied in the following condition; hardness and tensile strength shall be determined in accordance with ASTM A370:

#### 3.2.1 Bars

Bars shall be annealed having hardness not higher than 202 HBW, or equivalent (see 8.2).

3.2.1.1 All hexagons regardless of size, and other bars 2.750 inches (69.85 mm) and under in nominal diameter or least distance between parallel sides, shall be cold finished.

3.2.1.2 Bars, other than hexagons, over 2.750 inches (69.85 mm) in nominal diameter or least distance between parallel sides shall be hot finished or cold finished.

3.2.1.3 Bars shall not be cut from plate (see 4.4.2).

#### 3.2.2 Wire

Wire shall be cold drawn and annealed, or annealed and cold finished, having a tensile strength not higher than 100 ksi (689 MPa) or equivalent hardness (see 8.3).

#### 3.2.3 Forgings and Flash-Welded Rings

Forgings and flash-welded rings shall be annealed having hardness not higher than 183 HBW, or equivalent (see 8.2).

3.2.3.1 Flash-welded rings shall not be supplied unless specified or permitted on the purchaser's part drawing. When supplied, rings shall be manufactured in accordance with AMS7493.

#### 3.2.4 Mechanical Tubing

Mechanical tubing shall be annealed and cold finished having hardness not higher than 202 HBW, or equivalent (see 8.2).

### 3.2.5 Stock for Forging or Flash-Welded Rings

Stock shall be as ordered by the forging or flash-welded ring manufacturer.

### 3.3 Properties

The product shall conform to the following requirements:

#### 3.3.1 Average Grain Size

Bars, wire, forgings, tubing, and stock for flash-welded rings shall be ASTM No. 0 or finer, determined in accordance with ASTM E112. Grain size of flash-welded rings shall be as agreed upon by the purchaser and producer.

### 3.4 Quality

The product as received by the purchaser shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

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

3.4.2 Bars and mechanical tubing shall be free from seams, laps, tears, and cracks after removal of the standard stock removal allowance in accordance with AS1182.

### 3.5 Tolerances

Tolerances shall conform to all applicable requirements of the following:

3.5.1 Bar and wire tolerances shall be in accordance with AMS2241.

3.5.2 Mechanical tubing tolerances shall be in accordance with AMS2243.

### 3.6 Exceptions

Any exceptions shall be authorized by the 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 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 product conforms to specified requirements.

### 4.2 Classification of Tests

#### 4.2.1 Acceptance Tests

All technical requirements, except grain flow of die forgings, are acceptance tests and shall be performed on each heat or lot as applicable.

#### 4.2.2 Periodic Tests

Grain flow of die forgings (see 3.4.1) is a periodic test and shall be performed at a frequency selected by the producer, unless frequency of testing is specified by the purchaser.