



<b>AEROSPACE MATERIAL SPECIFICATION</b>	<b>AMS5032™</b>	<b>REV. J</b>
	Issued 1943-10 Reaffirmed 2013-10 Revised 2024-09	
Superseding AMS5032H		
Wire, Steel 0.18 - 0.23C (SAE 1020) Annealed (Composition similar to UNS G10200)		

### RATIONALE

AMS5032J is the result of a Five-Year Review and update of the specification. The revision updates composition testing and reporting (see 3.1 and 3.1.1) and clarifies the exceptions requirements (see 3.3.1.2 and 8.4).

#### 1. SCOPE

##### 1.1 Form

This specification covers a low-carbon steel in the form of wire up to 0.249 inch (6.32 mm), inclusive, supplied as coils of wire or, when specified, as straight lengths.

##### 1.2 Application

This wire has been used typically for lockwire, 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](http://www.sae.org).

- AMS2259 Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
- AMS2370 Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock
- AS7766 Terms Used in Aerospace Metals Specifications

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<https://www.sae.org/standards/content/AMS5032J/>

## 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

## 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	0.18	0.23
Manganese	0.30	0.60
Phosphorus	--	0.040
Sulfur	--	0.050
Copper	--	0.15

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 AMS2259.

### 3.2 Condition

Wire shall be cold drawn and bright annealed.

### 3.3 Properties

Wire shall conform to the following requirements:

#### 3.3.1 Tensile Properties

Tensile properties of wire shall be as shown in Table 2, determined in accordance with ASTM A370.

**Table 2 - Tensile properties**

Tensile Strength	50 to 75 ksi (345 to 517 MPa)
Elongation in 10 Inches (254 mm), min	15%

3.3.1.1 Unless otherwise specified, the strain rate shall be set at 0.005 in/in/min (0.005 mm/mm/min) and maintained within a tolerance of  $\pm 0.002$  in/in/min ( $\pm 0.002$  mm/mm/min) through 0.2% offset yield strain. After the yield strain, the speed of the testing machine shall be set between 0.05 and 0.5 in/in (0.05 and 0.5 mm/mm) of the length of the reduced section (or distance between the grips for specimens not having a reduced section) per minute. Alternatively, an extensometer and strain rate indicator may be used to set the strain rate between 0.05 and 0.5 in/in/min (0.05 and 0.5 mm/mm/min).

3.3.1.2 Tensile property requirements for wire over 0.249 inch (6.32 mm) in nominal thickness shall be as agreed upon by the purchaser and producer and reported per 4.4.2.

### 3.3.2 Wrapping

A length of wire not less than 12 inches (305 mm) long shall withstand, without splitting or breaking, being wrapped in a closed helix for at least six complete turns around a cylindrical mandrel having a diameter equal to the nominal diameter of the wire and then unwrapped.

### 3.4 Quality

Wire, as received by the purchaser, shall be uniform in quality and condition, sound, cylindrical, and free from kinks, twists, scrapes, splits, laps, seams, and other imperfections detrimental to usage of the wire.

3.4.1 The surface of the wire shall have a bright, smooth finish free from pits, abrasions, and other surface defects.

### 3.5 Tolerances

Diameter tolerances shall conform to Table 3.

**Table 3A - Diameter tolerances, inch/pound units**

Nominal Diameter Inch	Tolerance, Inch Plus and Minus
Up to 0.076, excl	0.001
0.076 to 0.249, incl	0.002

**Table 3B - Diameter tolerances, SI units**

Nominal Diameter Millimeters	Tolerance, Millimeter Plus and Minus
Up to 1.93, excl	0.025
1.93 to 6.32, incl	0.051

### 3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.2.

## 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 AMS2370.

#### 4.4 Reports

4.4.1 The producer of wire shall furnish with each shipment a report showing the results of tests for composition of each heat and for tensile and wrapping 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, AMS5032J, size, and quantity.

4.4.2 When material produced to this specification is beyond the sizes allowed in the scope or tables, or exceptions authorized by the purchaser are taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement "This material is certified as AMS5032J(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 AMS2370.

### 5. PREPARATION FOR DELIVERY

#### 5.1 Identification

Shall be as follows:

5.1.1 Coils or reels of wire shall each be identified by a durable tag marked with not less than the purchase order number, AMS5032J, lot number, nominal size, quantity, and manufacturer's identification or shall be boxed and the box marked with the same information. When technical exceptions are taken (see 4.4.2), the material shall be marked with AMS5032J(EXC).

5.1.2 Straight lengths shall be bundled or boxed and shall have attached to each bundle or box a durable tag marked with the information of 5.1.1.

#### 5.2 Packaging

5.2.1 Wire shall be furnished in coils unless otherwise ordered as straight lengths. Each coil shall be one continuous length, properly coiled, and firmly tied.

5.2.2 Packages of 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.

#### 5.2.3 Protective Treatment

Wire shall be protected from corrosion prior to shipment.

### 6. ACKNOWLEDGMENT

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

### 7. REJECTIONS

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