Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 5032C
Superseding AMS 5032B
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UNS G10200

STEEL WIRE
0.18 - 0.23C (SAE 1020)

1. SCOPE:

1.1 Form: This specification covers a low-carbon steel in the form of wire.

1.2 Application: Primarily for use as lockwire.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2259 - Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2350 - Standards and Test Methods
AMS 2370 - Quality Assurance Sampling of Carbon and Low-Alloy Steels, Wrought Products Except Forgings and Forging Stock

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM A370 - Mechanical Testing of Steel Products
ASTM E350 - Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Standards:

MIL-STD-163 - Steel Mill Products, Preparation for Shipment and Storage

Printed in U.S.A.

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E350, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

	min	max
Carbon	0.18	0.23
Manganese	0.30	0.60
Phosphorus	--	0.040
Sulfur	--	0.050
Copper	--	0.15

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

3.2 Condition: Cold drawn and bright annealed.

3.3 Properties: Wire shall conform to the following requirements:

3.3.1 Tensile Properties: Shall be as follows, determined in accordance with ASTM A370:

Tensile Strength	50,000 - 75,000 psi (345 - 517 MPa)
Elongation in 10 in. (254 mm), min	15%

3.3.2 Bending: A length of wire not less than 12 in. (305 mm) long shall withstand, without splitting or breaking, being wrapped in a closed helix for at least 6 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 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: Unless otherwise specified, diameter tolerances shall conform to Table I.

TABLE I

Nominal Diameter Inch	Tolerance, Inch plus and minus
Up to 0.076, excl	0.001
0.076 to 0.249, incl	0.002

TABLE I (SI)

Nominal Diameter Millimetres	Tolerance, Millimetre plus and minus
Up to 1.93, excl	0.03
1.93 to 6.32, incl	0.05

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of wire shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the wire conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests.

4.3 Sampling: Shall be in accordance with AMS 2370.

4.4 Reports:

4.4.1 The vendor of wire shall furnish with each shipment three copies of a report showing the results of tests for chemical composition of each heat and for tensile and bending properties of each size from each heat. This report shall include the purchase order number, material specification number and its revision letter, size, and quantity from each heat.

4.4.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of wire, part number, and quantity. When wire for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of wire to determine conformance to the requirements of this specification, and shall include in the report a statement that the wire conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting: Shall be in accordance with AMS 2370.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Wire shall be identified as follows:

5.1.1 Coils or reels of wire shall each be identified by a durable tag marked with the purchase order number, AMS 5032C, nominal size, quantity, and manufacturer's identification or shall be boxed and the box marked with the same information.

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 Protective Treatment: Wire shall be coated with a suitable corrosion-preventive compound prior to shipment.

5.3 Packaging:

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

5.3.2 Packaging shall be accomplished in such a manner as to ensure that the wire, during shipment and storage, will be protected against mechanical injury and exposure to moisture.

5.3.3 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 this wire to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.