Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

AEROSPACE MATERIAL SPECIFICATION

AMS 7304B
Superseding AMS 7304A

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SPRINGS, STEEL
0.85 - 1.05C
Hardened and Tempered after Forming

1. SCOPE:

1.1 Type: This specification covers coiled springs made from cold-drawn, annealed, round, carbon-steel wire.

1.2 Application: Primarily for use in moderate stress applications at temperatures up to 350 F (177 C).

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., Two Pennsylvania Plaza, New York, New York 10001.

2.1.1 Aerospace Material Specifications:

AMS 2259 - Chemical Check Analysis Limits, Wrought Low Alloy and Carbon Steel
AMS 2350 - Standards and Test Methods
AMS 2640 - Magnetic Particle Inspection

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

ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
ASTM E350 - Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electric Steel, Ingot Iron, and Wrought Iron

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

2.3.1 Federal Standards:

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

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	0.85	1.05
Manganese	0.25	0.60
Phosphorus	--	0.045
Sulfur	--	0.050

3.1.1 Check Analysis: Composition variations shall meet the requirements of AMS 2259, paragraph titled "Carbon Steels, Wire, Other than Flat".

3.2 Condition: Hardened and tempered after forming.

3.3 Properties: Springs shall conform to the following requirements; hardness testing shall be performed in accordance with ASTM E18.

3.3.1 Hardness: Unless otherwise specified, finished springs shall have hardness of 64 - 69 HR30N or equivalent.

3.3.2 Decarburization: Springs shall be free from decarburization to the extent that the increase in hardness from the surface to any point below the surface will be not more than two points on the Rockwell Superficial 30-N scale or equivalent.

3.4 Quality: Parts shall be uniform in quality and condition, clean, sound, smooth, and free from foreign materials and from internal and external imperfections detrimental to their performance.

3.4.1 Springs shall be subject to magnetic particle inspection in accordance with AMS 2640. Standards for acceptance shall be as agreed upon by purchaser and vendor.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor 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 4.5. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that parts conform 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 routine control tests.

4.3 Sampling:

4.3.1 Composition: One sample shall be taken from each heat of wire.

4.3.2 Hardness and Decarburization: One sample, consisting of five pieces, shall be taken from each lot and tested for hardness. One piece shall be tested for decarburization. A lot shall be all springs of the same part number hardened and tempered in a single furnace charge.

4.4 Approval:

4.4.1 Sample springs shall be approved by purchaser before springs for production use are supplied, unless such approval be waived.

4.4.2 Vendor shall use the manufacturing procedures, processes, and methods of inspection on production parts to determine conformance to the requirements of this specification which are essentially the same as those used on the approved sample springs. If necessary to make any change in manufacturing procedures or processes which could affect reliability, material, or properties of the springs, vendor shall submit for reapproval a statement of the revised procedures and, when requested, sample springs. No production springs incorporating the revised procedures shall be shipped prior to receipt of reapproval.

4.5 Reports: The vendor of springs shall furnish with each shipment three copies of a report of the results of tests for chemical composition of each heat in the shipment and for hardness and decarburization for each lot in the shipment. This report shall include the purchase order number, specification number and its revision letter, contractor or other direct supplier of wire, part number, and quantity.