



AEROSPACE MATERIAL SPECIFICATION

AMS7304™**REV. F**

Issued	1948-07
Revised	1988-10
Noncurrent	2001-11
Reaf. Nonc.	2011-05
Stabilized	2015-12

Superseding AMS7304E

Springs, Steel
0.85 - 1.05C
Hardened and Tempered After Forming

UNS G10950

RATIONALE

AMS7304F is stabilized as mature technology that is not expected to change.

STABILIZED NOTICE

AMS7304F has been declared "STABILIZED" by AMS E Carbon and Low Alloy Steels Committee. This document will no longer be updated and may no longer represent standard industry practice. This document was stabilized because this document contains mature technology that is not expected to change and thus no further revisions are anticipated. Previously this document was reaffirmed noncurrent. The last technical update of this document occurred in October 1988. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to this specification; including exceptions listed on the certification.

NOTE: In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

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1. SCOPE:

1.1 Type:

This specification covers coiled springs fabricated from carbon-steel wire.

1.2 Application:

Primarily for use in moderate stress applications 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 shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications:

Available from SAE, 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 2640 Magnetic Particle Inspection

2.2 ASTM Publications:

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

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

2.3 U.S. Government Publications:

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

2.3.1 Military Standards:

MIL-STD-794 Parts and Equipment, Procedures for Packaging and Packing of

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 spectrochemical methods, or by other analytical methods acceptable to purchaser:

	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 applicable requirements of AMS 2259.

3.2 Condition:

Hardened and tempered after forming from cold-drawn, annealed, round, carbon steel wire.

3.3 Properties:

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

3.3.1 Hardness:

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:

Springs, as received by purchaser, shall be uniform in quality and condition, sound, smooth, and free from foreign materials and from imperfections detrimental to their performance.

3.4.1 Springs shall be subjected to magnetic particle inspection in accordance with AMS 2640; the method of inspection and standards for acceptance shall be as agreed upon by purchaser and vendor.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of springs shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the springs conform to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the first-article shipment of a spring to a purchaser, when a change in material and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction springs shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

4.3 Sampling:

Shall be in accordance with the following; a lot shall be all springs of the same part number produced from a single heat of wire, hardened and tempered in a single furnace charge, and presented for vendor's inspection at one time.

4.3.1 Composition: One sample from each heat of wire.

4.3.2 Hardness: Five springs from each lot.

4.3.3 Decarburization: One spring from each lot.

4.3.4 Magnetic Particle Inspection: As specified by purchaser.

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 by purchaser.