

Submitted for recognition as an American National Standard

SPRINGS, STEEL
0.85 - 1.05C

Hardened and Tempered After Forming

UNS G10950

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).zw

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

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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.

4.4.2 Vendor shall use manufacturing procedures, processes, and methods of inspection on production springs which are essentially the same as those used on the approved sample springs. If necessary to make any change in manufacturing procedures or processes, vendor shall submit for reapproval of the process a statement of the proposed changes in operations and, when requested, sample springs produced by the revised procedure. Production springs incorporating the revised operations shall not be shipped prior to receipt of reapproval.

4.5 Reports: The vendor of springs shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for hardness and decarburization of each lot. This report shall include the purchase order number, lot number, AMS 7304D, contractor or other direct supplier of wire, part number, and quantity.

4.6 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the springs may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the springs represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification: Each spring shall, when size permits, be marked with the wire coil number and part number on one end. Marking shall appear on the chamfer or ground face of the dead coil. If springs are too small to be marked individually, part numbers shall appear on the containers.

5.2 Protective Treatment: Springs shall be protected, during shipment and storage, by coating with a suitable corrosion-preventive compound which is readily removable by washing in hydrocarbon solvents. Springs received by purchaser in a corroded condition will be subject to rejection.

5.3 Packaging:

5.3.1 Springs of different part numbers shall be packaged in separate containers, each container marked with not less than the following information:

SPRINGS, STEEL

ANS 7304D

PART NUMBER _____

PURCHASE ORDER NUMBER _____

QUANTITY _____

MANUFACTURER'S IDENTIFICATION _____

5.3.2 Containers of springs 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 springs to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode-of transportation.

5.3.3 For direct U.S. Military procurement of springs, packaging shall be in accordance with MIL-STD-794, Level A or Level C, as specified in the request for procurement. Commercial packaging as in 5.3.2 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS: Springs not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.