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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5110H

Issued DEC 1939
Revised OCT 2001

Superseding AMS 5110G

Carbon Steel, Wire and Springs
0.75 - 0.88C (SAE 1080)
Spring Temper, Cold Drawn

(Composition similar to UNS G10800)

1. SCOPE:

1.1 Form:

This specification covers a carbon steel in the form of wire supplied as coils of wire or as finished springs.

1.2 Application:

This wire has been used typically for springs and other applications where spring temper is required, 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2259	Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2370	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Wrought Products and Forging Stock

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor, West Conshohocken, PA 19428-2959.

ASTM A 370 Mechanical Testing of Steel Products
ASTM E 350 Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 350, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	min	max
Carbon	0.75	0.88
Manganese	0.60	0.90
Silicon	0.10	0.30
Phosphorus	--	0.040
Sulfur	--	0.050

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

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Wire: Cold drawn.

3.2.2 Finished Springs: Stress relieved.

3.3 Heat Treatment:

Finished springs, after coiling, shall be stress relieved by heating to 550°F + 10 (288°C+6), holding at heat for not less than one hour, and cooling in air.

3.4 Properties:

The product shall conform to the following requirements:

3.4.1 Tensile Properties at Room Temperature: Tensile properties of wire shall be as shown in Table 2, determined in accordance with ASTM A 370.

TABLE 2A - Tensile Properties, Inch/Pound Units

Nominal Diameter Inch	Tensile Strength ksi, min	Tensile Strength ksi, max
Up to 0.062, incl	300	--
Over 0.062 to 0.091, incl	285	335
Over 0.091 to 0.124, incl	265	315
Over 0.124 to 0.149, incl	255	295
Over 0.149 to 0.174, incl	240	280
Over 0.174 to 0.191, incl	225	265
Over 0.191 to 0.250, incl	200	250

TABLE 2B - Tensile Properties, SI Units

Nominal Diameter Millimeters	Tensile Strength MPa, min	Tensile Strength MPa, max
Up to 1.57 incl	2068	--
Over 1.57 to 2.31, incl	1965	2310
Over 2.31 to 3.15, incl	1827	2172
Over 3.15 to 3.78, incl	1758	2034
Over 3.78 to 4.42, incl	1655	1931
Over 4.42 to 4.85, incl	1551	1827
Over 4.85 to 6.35, incl	1379	1724

3.5 Quality:

3.5.1 Wire: Wire, before forming into springs, shall have a bright, smooth, cold-drawn finish and shall be free from imperfections such as seams, pits, nicks, scratches, and other imperfections detrimental to usage of the wire. A dull surface resulting from the use of a phosphate coating during drawing is acceptable.

3.5.2 Springs: The surfaces of finished springs, as received by purchaser, shall be uniform and free from pits, nicks, scratches, and marks due to grinding, drawing, or coiling, and from other imperfections detrimental to performance of the springs.

3.6 Tolerances:

Wire shall be supplied to the tolerances shown in Table 3 and 3.6.1.

TABLE 3A - Diameter Tolerances, Inch/Pound Units

Nominal Diameter Inch	Tolerance, Inch Plus and Minus
Up to 0.026, incl	0.0003
Over 0.026 to 0.063, incl	0.0005
Over 0.063 to 0.150, incl	0.0010
Over 0.150	0.0015

TABLE 3B - Diameter Tolerances, SI Units

Nominal Diameter Millimeters	Tolerance, Millimeter Plus and Minus
Up to 0.66, incl	0.008
Over 0.66 to 1.60, incl	0.013
Over 1.60 to 3.81, incl	0.025
Over 3.81	0.038

3.6.1 Wire shall not be out-of-round by more than one-half the total permissible variation shown in Table 3.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the wire shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. 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:

Shall be in accordance with AMS 2370.

4.4 Reports:

The vendor of wire shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for tensile 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, AMS 5110H, size, and quantity.