



AEROSPACE STANDARD

AS13572**REV. A**

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Superseding AS13572

Springs, Helical, Compression and Extension

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature. This standard has been stabilized.

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NOTICE

This document has been taken directly from U.S. Military Specification MIL-S-13572C, Amendment 1 and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-S-13572C, Amendment 1. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

Under Department of Defense policies and procedures, any qualification requirements and associated qualified products lists are mandatory for DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this SAE technical document.

1. SCOPE:

1.1 Scope:

This specification covers helical compression and extension springs, made from single wire or rod of either round or special cross-section (see 6.4).

1.2 Classification:

The springs shall be of the following types and grades (see 6.2).

1.2.1 Types:

- Type I - Compression
- Type II - Extension

Grades

Grade A - Highly stressed or critical applications (recoil springs and other special applications) (see 6.1).

Grade B - General applications (see 6.1).

2. APPLICABLE DOCUMENTS:

2.1 Government Documents:

- 2.1.1 Specifications and standards: The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto cited in the solicitation.

SPEFICATIONS

FEDERAL

- QQ-P-416 - Plating, Cadmium (Electrodeposited)
- PPP-B-566 - Boxes, Folding, Paperboard
- PPP-B-591 - Boxes, Fiberboard, Wood-Cleated
- PPP-B-601 - Boxes, Wood, Cleated Plywood
- PPP-B-621 - Box, Wood, Nailed and Lock-cornered

2.1.1 (Continued):

- PPP-B-636 - Box, Shipping, Fiberboard
- PPP-B-640 - Boxes, Fiberboard, Corrugated, Triple-Wall
- PPP-B-676 - Boxes, Set-Up
- PPP-T-76 - Tape, Pressure Sensitive Adhesive, packaging (For Carton Sealing)
- MILITARY
- MIL-P-116 - Preservation, Methods of
- MIL-P-117 - Bags, Sleeve and Tubing-Interior Packaging
- MIL-C-16173 - Corrosion Preventive Compound, Solvent Cutback, Cold Application
- MIL-S-13165 - Shot Peening of Metal Parts
- DOD-P-16232 - Phosphate Coatings, Heavy, Manganese or Zinc Base (For Ferrous Metals)
- MIL-STD-1190 - Minimum Guidelines For Level C Preservation, Packing & Marking
- MIL-STD-29 - Spring, mechanical, Drawing Requirements For
- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
- MIL-STD-129 - Marking for Shipment and Storage
- MIL-STD-147 - Palletized Unit Loads
- MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking, and Waterproofing with Appropriate Test Methods
- MIL-STD-1189 - Standard Department of Defense Bar Code Symbolology
- MIL-STD-1949 - Inspection, Magnetic Particle
- MIL-STD-6866 - Inspection, Penetrant Method of

(Copies of specifications, standards, drawings and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the Contracting Officer.)

2.2 Other publications:

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

ASTM

A380 - Cleaning and Descaling Stainless Steel Parts, Equipment and Systems

B633 - Electrodeposited Coatings of Zinc on Iron and Steel

D3951 - Commercial Packaging, Practice for

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, Pennsylvania 19103)

2.3 Order of precedence:

In the event of a conflict between the test of this specification and the references cited herein (except for MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS:

3.1 Material:

Material shall be as specified on the spring drawing or the applicable Military Standards (MS) (see 6.3) and shall be selected from the specification list in 6.4 as applicable. When material is not covered by a Government specification or an approved non-Government document, the contractor shall furnish a certificate of chemical analysis and mechanical properties for the proposed material (see 4.4.1).

- 3.1.1 Decarburization in Springs: Unless otherwise specified, prior to being wound material for Grade A spring shall be centerless ground to remove all surface decarburization and produce a true circular cross section. When magnified to 100 diameters there shall be no free ferrite visible. When specified (see 6.2), springs which are heat treated after coiling shall conform to the following depths of decarburization:

TABLE 1-1. Maximum Decarburization in Grade A Springs¹

	<u>Hot Wound</u>	<u>Cold Wound</u>
Complete ²	0.000 in. (No complete Decarburization)	0.000 in. (No complete Decarburization)
Partial ³	0.005 in.	1% Wire Diameter, not to exceed 0.0015 in.

¹ Measurements are made from the spring surface

² Complete Decarburization - loss of carbon content at the surface of a steel specimen to a level below the solubility limit of carbon in ferrite so that only ferrite is present.

³ Partial Decarburization - loss of carbon content at the surface of a steel specimen to a level less than the bulk carbon content of the unaffected interior but greater than the room temperature solubility limit of carbon in ferrite."

3.1.2 Heat treatment: Unless otherwise specified on the drawing, heat treating methods may be determined by the manufacturer. Hot-wound, grade A springs that are coiled at a temperature above 1700 degrees Fahrenheit (F) shall be cooled in air to a distinct black heat, or below the transformation temperature, before they receive further heat treatment.

3.1.3 Stress relief: Unless otherwise specified (see 6.2), cold-wound springs just formed shall be given a suitable stress relief treatment conforming to 3.1.3.1 through 3.1.3.4. The specific time and temperature shall be determined by the manufacturer from the range of times and temperatures listed. The temperature used will normally be the maximum which will leave the original hardness of the wire essentially unchanged.

3.1.3.1 Alloy steel springs: Thermally treat for 20-60 minutes at 500-800 degrees F.

3.1.3.2 Carbon steel springs: Thermally treat for 20-60 minutes at 450-750 degrees F.

3.1.3.3 Copper-base alloy springs: Thermally treat for 20-60 minutes at 250-400 degrees F.

3.1.3.4 Corrosion-resistant steel springs: Thermally treat for 20-60 minutes at 450-900 degrees F.

3.2 Shot peening:

When specified (see 6.2), open-wound springs shall be shot peened in accordance with MIL-S-13165.