AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 7301B

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STEEL SPRINGS, HIGHLY STRESSED
0.95Cr - 0.2V (0.48 - 0.53C) (SAE 6150)

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

2. TYPE: Coil springs made from cold drawn annealed round wire.

3. APPLICATION: Primarily valve springs, clutch springs and other highly stressed springs on which a case is required as assurance that surfaces will not be decarburized. Hardness of these springs is extremely high and use is not recommended without careful consideration.

4. COMPOSITION: Wire from which springs are made shall conform to the following:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.48 - 0.53	0.02	0.02
Manganese	0.70 - 0.90	0.03	0.03
Silicon	0.20 - 0.35	0.02	0.02
Phosphorus	0.025 max	--	0.005
Sulfur	0.025 max	--	0.005
Chromium	0.80 - 1.10	0.05	0.05
Vanadium	0.15 min	0.01	--

5. CONDITION: Hardened and tempered after forming.

6. FABRICATION:

6.1 Metal shall not be removed from any active coil; special care shall be exercised during removal of burrs from spring ends to ensure that this requirement is met.

6.2 Springs shall be heat treated by carburizing, cyaniding or carbonitriding above the transformation range of the steel, quenching and tempering. All possible care shall be exercised during heat treatment to prevent surface and internal cracking.

6.3 After heat treatment, springs shall be uniformly blasted all over, with grit of suitable size, for such time and in such manner as will produce springs which are satisfactorily cleaned and on which the surface effect is not lower than that agreed upon by purchaser and vendor.

6.4 Grit blasted springs shall subsequently be uniformly blasted, preferably in automatic equipment, with sand of suitable size, for sufficient time to produce smooth surfaces.

7. CONDITION:

7.1 Hardness: Unless otherwise specified on the drawing, core hardness of finished springs shall be Rockwell Superficial 30-N 65-69, or equivalent.

7.2 Grain Size: Five or finer, ASTM E19-46, method b.

7.3 Case: Case depth on finished springs shall be 0.001 - 0.005 inch.

7.3.1 Bend test specimens from finished springs shall, as evidence of the presence of case, fracture before the angle of bend reaches 180 degrees, when bent at room temperature around a diameter equal to twice the diameter of the wire, with outside diameter of spring on inside of bend. Sections of springs, or wire processed in the same manner as springs, shall, as evidence of ductility of the springs, not crack when bent at room temperature through and angle, measured under load, of 5 degrees around a diameter equal to twice the diameter of the wire.

7.3.2 Springs shall be free from partial and complete decarburization.

7.4 Springs shall be subject to magnetic particle inspection.

8. QUALITY: Springs shall be uniform in quality and condition, clean, sound, smooth, and free from foreign materials and from internal and external defects detrimental to their performance.

9. REPORTS: Unless otherwise specified, the vendor of springs shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of wire, part number, and quantity. When wire for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of wire to determine conformance to the requirements of this specification, and shall include in the report a statement that the wire conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

10. IDENTIFICATION: Unless otherwise agreed upon by purchaser and vendor, each spring shall be marked with coil number and part number on one end. Marking shall appear on chamfer or on ground face of dead coil. If springs are too small to be marked individually, part numbers shall appear on containers.

11. PACKAGING:

11.1 Springs of different part numbers shall be shipped in separate containers, each marked with part number.

11.2 Springs shall be protected during shipment and storage by a coating of suitable corrosion preventive compound which is readily removable by washing in hydrocarbon solvents. Springs received by purchaser in corroded condition will be subject to rejection.

12. APPROVAL:

12.1 To assure adequate performance characteristics, springs shall be approved by purchaser before springs for production use are supplied, unless such approval be waived.