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SURFACE VEHICLE RECOMMENDED PRACTICE

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Special Quality High-Tensile, Hard-Drawn Mechanical Spring Wire and Springs

1. ***Scope***—This SAE Recommended Practice covers the mechanical and chemical requirements of special quality high-tensile, hard-drawn, carbon-steel spring wire with restricted size tolerances. This material is used where such restricted dimensional requirements are necessary for the manufacture of highly stressed mechanical springs and wire forms. It is generally employed for applications subject to static loads or infrequent stress repetitions. This document also covers the processing requirements for springs and forms fabricated from this wire.

2. ***References***

2.1 **Applicable Publications**—The following publications form a part of this specification to the extent specified herein.

2.1.1 ASTM PUBLICATIONS—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A 510—Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel
ASTM A 510M—Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel (Metric)
ASTM A 679—Specification for Steel Wire, High Tensile Strength, Hard-Drawn, for Mechanical Springs
ASTM A 679M—Specification for Steel Wire, High Tensile Strength, Hard-Drawn, for Mechanical Springs (Metric)

3. ***Wire***

3.1 The wire shall conform to ASTM A 679/A 679M and ASTM A 510/A 510M.

3.2 Rolling practice shall be controlled to insure that the finished wire shall have no seams greater than 3.5% of the wire diameter or 0.25 mm (0.010 in), whichever is the smaller, as measured on a transverse section.

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4. *Springs*

4.1 Heat Treatment—Unless otherwise agreed upon by purchaser and supplier, tension and compression springs coiled from this wire shall be stress relieved for a minimum of 30 min at heat. The normal temperature range is 230 to 290 °C (450 to 550 °F).

4.2 Surface—The surface of the finished springs shall be as described for the wire. In addition, there shall be no excessive coiling marks, nicks, or gouges which would impair the serviceability of the parts.

4.3 Electroplating—Electroplating of parts made from special-quality, high-strength, hard-drawn wire is not recommended because of susceptibility to hydrogen embrittlement. If plating is necessary, parts should be heated at a temperature of not less than 175 °C (350 °F) for a minimum of 2 h immediately after plating. Other temperatures and times may be necessary.

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