



Standard Specification for Steel, Flat Wire, Carbon, Cold-Rolled¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This specification covers carbon steel flat wire in coils or cut lengths. Flat wire is classified as a cold-rolled section, rectangular in shape, 0.500 in. [12.7 mm] or less in width and under 0.250 in. [6.35 mm] in thickness.

1.2 Low-carbon steel flat wire is produced from steel compositions with a maximum carbon content of 0.25 % by cast or heat analysis.

1.3 Carbon spring steel flat wire is produced to a carbon range in which the specified or required maximum is over 0.25 % by cast or heat analysis.

1.3.1 Two types of carbon spring steel flat wire are produced:

1.3.1.1 Untempered cold-rolled carbon spring steel flat wire, produced to several desirable combinations of properties and

1.3.1.2 Hardened and tempered carbon spring steel wire.

1.4 Definite application flat wire is a product developed for a specific application and may be specified only by size and descriptive name.

1.5 The values stated in either inch-pound units or SI units are to be regarded as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in non-conformance with this specification.

2. Referenced Documents

2.1 *ASTM Standards*:²

A370 Test Methods and Definitions for Mechanical Testing of Steel Products

A510 Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel

A510M Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel (Metric) (Withdrawn 2011)³

A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

E45 Test Methods for Determining the Inclusion Content of Steel

E112 Test Methods for Determining Average Grain Size

E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

2.2 *Military Standard*:⁴

MIL-STD-129 Marking for Shipment and Storage

2.3 *Federal Standard*:⁴

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)

2.4 *SAE Standard*:⁵

Recommended Practice SAE J 419 Methods of Measuring Decarburization

3. Terminology

3.1 *Definitions of Terms Specific to This Standard*:

3.1.1 *annealing*—the process of heating to and holding at a suitable temperature and then cooling at a suitable rate, for such purposes as reducing hardness, facilitating cold working, producing a desired microstructure, or obtaining desired mechanical, physical, or other properties.

3.1.2 *batch annealing*—annealing that is generally performed in large cylindrical bell type or large rectangular box or car-type furnaces. The product is protected from scaling and decarburization by the use of a controlled atmosphere that envelops the charge in an inner chamber sealed to prevent the influx of air or products of combustion. The coils or bundles

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.19 on Steel Sheet and Strip.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://www.dodssp.daps.mil>.

⁵ Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001, <http://www.sae.org>.