Designation: A 417 – 93 (Reapproved 2004)

Standard Specification for Steel Wire, Cold-Drawn, for Zig-Zag, Square-Formed, and Sinuous-Type Upholstery Spring Units[1]

This standard is issued under the fixed designation A 417; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers round, uncoated, cold-drawn spring wire in coils having properties and quality intended for the manufacture of the following upholstery springs:

1.1.1 *Type A*—Zig-zag (U-formed),

1.1.2 *Type B*—Square-formed, and

1.1.3 *Type C*—Sinuous for furniture spring units.

1.2 These types of upholstery springs are used in the manufacture of automotive seat springs and furniture springs. The wire is not intended for the manufacture of mechanical springs.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance With Specifications

2.2 *AIAG Standard:*

AIAG B-5 02.00 Primary Metals Identification Tag Application Standard[3]

3. Ordering Information

3.1 Orders for material under this specification should include the following information for each ordered item:

3.1.1 Quantity (weight),

3.1.2 Name of material (name of specific type required) (Section 1 and Table 1),

3.1.3 Diameter (Table 2),

3.1.4 Packaging, marking, and loading (Section 10),

3.1.5 ASTM designation and date of issue, and

3.1.6 Heat (cast) analysis (if desired).

NOTE 1—A typical ordering description is as follows: 50 000 lb [15 000 kg] cold-drawn, upholstery, spring wire Type A for zig-zag-type springs, Class 1, 200 to 300 ksi, size 0.148 in. [3.0 mm] in 2000-lb [700 kg] coils to ASTM A 417, dated _____.

4. Manufacture

4.1 The steel shall be made by any of the following processes: open-hearth, basic-oxygen, or electric-furnace.

4.2 A sufficient discard shall be made to ensure freedom from injurious piping and undue segregation.

4.3 The wire shall be cold-drawn to produce the desired mechanical properties.

5. Chemical Composition

5.1 Upholstery spring wire for these types of springs is customarily produced within the chemical ranges shown below. Chemical composition and processing may vary depending on the gage of wire and specific use.

Carbon, %	0.50 to 0.75[A]
Manganese, %	0.60 to 1.20[A]
Phosphorus, max, %	0.040
Sulfur, max, %	0.050

[A] In any lot in which all the wire is of the same size and type, and submitted for inspection at the same time, the carbon content shall not vary more than 0.20 %, and the manganese content shall not vary more than 0.30 %.

5.2 An analysis of each heat (cast) shall be made by the manufacturer to determine the percentage of elements specified above. The analysis shall be made from a test sample preferably taken during the pouring of the heat (cast). The chemical composition thus determined shall be reported to the purchaser or his representative upon request.

6. Mechanical Properties

6.1 *Tension Test*:

6.1.1 *Requirements*—The material as represented by tension test specimens shall conform to the requirements prescribed in Table 1 for the various sizes and specified types.

6.1.2 *Number of Tests*—One test specimen shall be taken for each ten coils, or fraction thereof, in a lot. Each heat in a given lot shall be tested.

6.1.3 *Location of Tests*—The test specimen shall be taken from either end of the coil.

[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 A01.03 on Steel Rod and Wire.

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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] Available from Automotive Industry Action Group (AIAG), 26200 Lahser Rd., Suite 200, Southfield, MI 48034.