



Standard Test Methods of Testing Fine Round and Flat Wire for Electron Devices and Lamps¹

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1. Scope

1.1 These test methods cover the testing of fine wire, flat or round, approximately 0.010 in. (0.25 mm) and smaller in diameter or thickness, used in electronic devices and lamps.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

B 63 Test Method for Resistivity of Metallic Conducting Resistance and Contact Materials²

D 374 Test Methods for Thickness of Solid Electrical Insulation³

F 16 Test Methods for Measuring Diameter or Thickness of Wire and Ribbon for Electronic Devices and Lamps⁴

F 205 Test Method for Measuring Diameter of Fine Wire by Weighing⁴

F 289 Specification for Molybdenum Wire and Rod for Electronic Applications⁴

3. Test Specimens

3.1 The number of spools per shipment to be checked shall be agreed upon by the producer and consumer. Three test specimens from each spool to be tested shall be taken for the purpose of each of the tests covered by these methods, except Section 4, where one specimen per shipment shall be submitted. These specimens shall be selected sufficiently far from either end of the spool of wire to be free from kinks, bends, and distortion. With the exceptions mentioned in 3.2, the specimens shall be taken from points in the length of the wire separated by at least 1 ft (305 mm).

3.2 For the edgewise curvature test, straightness test, and

tension tests the specimens shall be taken from points in the length of the wire separated by at least 3 ft (0.9 m).

4. Chemical Analysis

4.1 In case of disagreement between producer and consumer chemical analysis of the material shall be made in accordance with the methods of the American Society for Testing and Materials for the respective materials when such methods of analysis are available. When ASTM test methods are not available, the analytical procedures shall be agreed upon by the producer and the consumer.

5. Dimensions

5.1 *Procedure A for Round Wire*—Determine the weight-size of round wire in accordance with Method F 205.

5.2 *Procedure B for Round Wire*—As an alternative method, the diameter of wire over 0.005 in. (0.13 mm) may be determined in accordance with Test Methods D 374.

5.3 *Procedure for Flat Wire:*

5.3.1 Determine the dimensions of flat wire in accordance with 5.1 in conjunction with width as measured in accordance with 5.2, or if agreed upon by the manufacturer and the purchaser, any dimension exceeding 0.005 in. may be determined in accordance with 5.2 alone.

5.3.2 In determining the width of flat wire, form a flatwise loop loosely with the ends held between the fingers. The minor axis of the loop shall be $\frac{1}{2}$ to $\frac{3}{4}$ of the diameter of the micrometer jaws. Measure the width of the ribbon with the curve loop perpendicular to the micrometer jaws. Take care not to distort the ribbon or bend it out of the correct plane during measurement.

5.4 In case of disagreement between producer and consumer, Methods F 16 shall be used as the referee method.

5.5 *Report*—The report shall include the average weight of wire or ribbon in mg/200 mm to three significant figures. The average measurements for diameter, width, or thickness shall be reported to the nearest 0.0001 in. (0.002 mm).

6. Out-of-Roundness

6.1 *Procedure*—Measure out-of-roundness on round wire over 0.005 in. (0.13 mm) in diameter in accordance with Sections 3 and 4 of Methods D 374. For wire 0.005 in. or less in diameter the same method shall apply except a bench type micrometer reading to 0.0001 in. (0.002 mm) shall be used. Make the measurements by exploring a plane of cross section of the test specimen to determine both minimum and maximum

¹ These test methods are under the jurisdiction of ASTM Committee F-1 on Electronics and are the direct responsibility of Subcommittee F01.03 on Metallic Materials.

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² *Annual Book of ASTM Standards*, Vol 03.04.

³ *Annual Book of ASTM Standards*, Vol 10.01.

⁴ *Annual Book of ASTM Standards*, Vol 10.04.