Designation: F364 – 96 (Reapproved 2025)

Standard Specification for Molybdenum Flattened Wire for Electron Tubes [1]

This standard is issued under the fixed designation F364; 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 two types of molybdenum flattened wire up to 0.050 in. (1.27 mm) thick and up to 0.375 in. (9.52 mm) wide, specifically for use in electron tubes. The two grades have UNS numbers R03604 and R03603.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *The following safety hazards caveat pertains only to the test method described in this specification (see 10.2). This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E18 Test Methods for Rockwell Hardness of Metallic Materials

E315 Test Methods for Chemical Analysis of Molybdenum (Withdrawn 2010)[3]

E384 Test Method for Microindentation Hardness of Materials

3. Classification

3.1 Two types of molybdenum flattened wire are covered by this specification:

3.1.1 *Type I, UNS R03604*—This type shall have the composition limits prescribed in Table 1.

3.1.2 *Type II, UNS R03603*—This type shall be a high-recrystallization-temperature material having the composition limits prescribed in Table 1 and shall be capable of retaining its ductility after firing at a temperature of 2375 °F ± 25 °F (1300 °C ± 14 °C) for at least 20 min.

4. Ordering Information

4.1 Orders for material under this specification shall include the following information:

4.1.1 Quantity of each size,

4.1.2 Dimensions or size (see 8.1),

4.1.3 Edgewise curvature (camber) if required (see 8.2),

4.1.4 Type (see 3.1),

4.1.5 Temper (see 7.1), and

4.1.6 How furnished (coils, spools, etc.).

5. Materials and Manufacture

5.1 The molybdenum wires covered by this specification shall be made by any appropriate process.

NOTE 1—It has been found that molybdenum wire made by the powder metallurgy process will meet the requirements of this specification.

6. Chemical Composition

6.1 Type I and Type II molybdenum wire shall conform to the chemical compositions prescribed in Table 1.

6.2 The materials shall be analyzed in accordance with Test Methods E315 or other appropriate ASTM methods when available. Other methods, as mutually agreed upon between seller and purchaser, may be employed.

7. Physical Properties

7.1 *Temper*—Material under this specification shall be supplied in one of the following classifications of temper:

7.1.1 *Hard*—As-rolled, not stress-relieved, suitable for spring applications, or

7.1.2 *Stress-Relieved*— Suitable for bending or winding.

[1] This specification is under the jurisdiction of ASTM Committee B10 on Reactive and Refractory Metals and Alloys and is the direct responsibility of Subcommittee B10.04 on Molybdenum and Tungsten.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. 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.