



Standard Specification for Brazing Filler Metals for Electron Devices¹

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1. Scope

1.1 This specification covers requirements for filler metals suitable for brazing internal parts and other critical areas of electron devices in a nonoxidizing atmosphere (Note 1).

1.2 These materials are available in strip or wire or preforms made by blanking the strip or bending the wire. Powders are also available.

NOTE 1—Brazing filler metals for general applications are specified in AWS Specification A 5.8.

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

2. Referenced Documents

2.1 ASTM Standards:

B 214 Test Method for Sieve Analysis of Granular Metal Powders²

E 11 Specification for Wire-Cloth Sieves for Testing Purposes³

F 19 Test Method for Tension and Vacuum Testing Metalized Ceramic Seals⁴

2.2 American Welding Society:

A 5.8 Specification for Brazing Filler Metals⁵

C 3.2 Method for Evaluating the Strength of Braze Joints⁵

3. Classification

3.1 Brazing filler metals which are vacuum grade and are classified on the basis of chemical composition shown in Table 1. The difference between Grade 1 and 2 are the impurity limitations. Grade 1 required generally lower levels of impurities.

4. Ordering Information

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

4.1.1 Quantity,

4.1.2 Dimensions and tolerances (Table 1),

4.1.3 Form (rod, bar, wire, etc.),

4.1.4 AWS classification (Table 2),

4.1.5 Grade 1 or 2,

4.1.6 Special requirements or exceptions, and

4.1.7 Certification—State if certification is required.

5. Materials and Manufacture

5.1 The brazing filler metals shall be vacuum grade and fabricated by any method that yields a product conforming to the requirements of this specification.

6. Chemical Composition

6.1 The finished brazing filler metal shall conform to the chemical composition shown in Table 2 for Grade 1 or Grade 2 material.

7. Mechanical Properties

7.1 Unless otherwise specified, wire shall be furnished in soft temper most suitable for hand feeding or ring winding on mandrels. A minimum elongation of 10 % in 2 in. (50.8 mm) indicates that the wire is annealed.

7.2 Unless otherwise specified, strip shall be furnished in hard as-rolled temper to facilitate clean blanking of thin shims or preforms. A maximum elongation of 5 % in 2 in. designates the strip as hard.

8. Dimensions and Permissible Variations

8.1 These materials must conform to the dimensional limitations listed in Table 2 for strip, wire, and preforms or Table 3 for size of powdered brazing filler metals.

9. Finish

9.1 The surface of strip, wire, or preforms shall be as smooth and free of dirt, oxide, pits, deep scratches, seams, slivers, stains, scale, blisters, edge cracks, trimming burrs, waves, wrinkles, and other defects as best commercial practice will permit.

10. Melting Test (for Cleanness and Spatter)

10.1 *Requirements*—Since cleanness and spattering are important considerations in the use of these materials, a special melting test is used to determine their suitability. For this test, the melting temperatures required are listed in Table X1.1. The material shall also comply with the requirements of 10.2.4.

¹ This specification is under the jurisdiction of ASTM Committee F-1 on Electronics and is the direct responsibility of Subcommittee F01.03 on Metallic Materials.

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² *Annual Book of ASTM Standards*, Vol 02.05.

³ *Annual Book of ASTM Standards*, Vol 14.02.

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

⁵ Available from American Welding Society, 2501 Northwest 7th St., Miami, FL 33125.