Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA., 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4764A
Superseding AMS 4764
Issued 9-3-66
Revised 7-15-78

BRAZING FILLER METAL, COPPER
52.5Cu - 38Mn - 9.5Ni
1615° - 1700°F (880° - 925°C) Solidus-Liquidus Range

1. SCOPE:

1.1 Form: This specification covers a copper alloy in the form of wire, rod, sheet, strip, and powder.

1.2 Application: Primarily for joining corrosion and heat resistant alloys where high strength, good ductility, and only short-time oxidation resistance above 1000°F (540°C) are required. Provides a very good color match for corrosion-resistant steels.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2222 - Tolerances, Copper and Copper Alloy Sheet, Strip, and Plate
AMS 2224 - Tolerances, Copper and Copper Alloy Wire
AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B214 - Sieve Analysis of Granular Metal Powders
ASTM E478 - Chemical Analysis of Copper-Base Alloys

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Specifications:

MIL-C-3993 - Copper and Copper-Base Alloy Mill Products, Packaging of

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E478, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

ø	min	max
Copper	51.0	54.0
Manganese	36.0	40.0
Nickel	8.5	10.5
Other Elements, total (3.1.1)	--	0.5

ø 3.1.1 Determination not required for routine acceptance.

3.2 Condition: The product shall be supplied in the following condition:

3.2.1 Wire: Cold drawn and bright annealed.

ø 3.2.2 Rod: Cold drawn, cold rolled, or extruded, as ordered, in hard temper, and cleaned.

ø 3.2.3 Sheet and Strip: Cold rolled, bright.

3.2.4 Powder: As fabricated.

3.3 Quality: The product shall be uniform in color, quality, and condition and free from foreign materials and from imperfections detrimental to its working qualities. Wire, rod, sheet, and strip shall be ø clean, sound, bright, and free from slivers, splitting, ragged edges, damaged ends, and other injurious imperfections. Powder shall have a metallic luster.

3.4 Sizes and Tolerances: The product shall be supplied in the following standard sizes and to the tolerances shown, unless otherwise specified:

3.4.1 Wire and Rod:

3.4.1.1 Nominal Diameters:

Inch	(Millimetres)	Inch	(Millimetres)	Inch	(Millimetres)
0.005	(0.13)	0.031	(0.79)	0.125	(3.18)
ø 0.007	(0.18)	0.040	(1.02)	0.175	(4.44)
0.010	(0.25)	0.047	(1.19)	0.188	(4.78)
0.015	(0.38)	0.062	(1.57)	0.225	(5.72)
0.025	(0.64)	0.094	(2.39)	0.250	(6.35)

3.4.1.2 Diameter Tolerance: AMS 2224 as applicable to refractory alloys.

3.4.2 Sheet and Strip:

3.4.2.1 Nominal Thicknesses:

Inch	(Millimetre)	Inch	(Millimetre)
0.001	(0.03)	0.006	(0.15)
ø 0.0015	(0.038)	0.008	(0.20)
0.002	(0.05)	0.010	(0.25)
0.003	(0.08)	0.014	(0.36)
0.004	(0.10)	0.020	(0.51)
0.005	(0.13)	0.030	(0.76)

3.4.2.2 Tolerances:

3.4.2.2.1 Thicknesses: Thicknesses under 0.002 in. (0.05 mm) shall have a tolerance of ±0.0002 in. ø (±0.005 mm); thicknesses 0.002 in. (0.05 mm) and over shall have tolerances conforming to AMS 2222 as applicable to refractory alloys.

3.4.2.2.2 Width of Individual Rolls: Shall not vary more than ±0.010 in. (±0.25 mm) from nominal width ordered.

3.4.2.2.3 Length in Individual Roll: Shall not be limited except that no roll shall weigh more than 75 lb (34 kg).

3.4.3 Powder:

3.4.3.1 Nominal Size: -140.

3.4.3.2 Tolerances: Powder shall be of such fineness that not more than a trace of powder will be retained on a No. 120 screen and not less than 80% will pass through a No. 140 screen, determined in accordance with ASTM B214.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each lot of product.

4.3 Sampling: Shall be in accordance with the following; a lot shall be all product produced from a single furnace charge or batch and presented for vendor's inspection at one time:

4.3.1 Composition: One sample from each lot.

4.3.2 Other Technical Requirements: As agreed upon by purchaser and vendor.

4.4 Reports:

4.4.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests on each lot to determine conformance to the composition requirements and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, lot number, form, nominal size, and quantity from each lot.

4.4.2 When parts made of this filler metal or assemblies requiring use of this filler metal are supplied, the part or assembly manufacturer shall inspect each lot of filler metal to determine conformance to the technical requirements of this specification and shall furnish with each shipment three copies of a report stating that the filler metal conforms. This report shall include the purchase order number, material specification number and its revision letter, part or assembly number and quantity.

4.5 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

5.1.1 The product shall be identified as agreed upon by purchaser and vendor.