

BRAZING FILLER METAL, PASTE, COPPER
Water Thinning

1. SCOPE:

- 1.1 Form: This specification covers a copper brazing filler metal in the form of a paste comprising a viscous mixture of powder in a suitable binder.
- 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. Used where inserts of copper wire or sheet are impractical and where carburization of the metals being joined is undesirable.

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 SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

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 Alloys

- 2.3 U.S. 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

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2.3.2 Military Specifications:

MIL-C-3993 - Copper and Copper 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 Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

	min	max
Active Ingredients	70.0	--
Vehicle	--	29.0
Emulsifying Agent	--	1.0

3.1.1 Active Ingredients: Shall consist of not less than 97% cuprous oxide (Cu_2O). The remainder shall be essentially cupric oxide (CuO) and metallic copper.

3.1.2 Vehicle: Shall consist of approximately equal proportions, by weight, of water and ethylene glycol.

3.1.3 Emulsifying Agent: Shall consist of algin or petroleum sulfonate or a mixture thereof.

3.2 Condition: Paste shall be supplied as fabricated and, unless otherwise agreed upon by purchaser and vendor, shall not contain flux.

3.3 Brazability: Paste shall be applied to a steel test panel, heated to $2050^\circ\text{F} \pm 25$ ($1120^\circ\text{C} \pm 15$) in a hydrogen atmosphere having dew point not higher than -40°F (-40°C), held at heat for 30 min. ± 2 and cooled to 1000°F (540°C) or lower in a protective atmosphere. The active ingredient shall be reduced completely to metallic copper and shall melt and flow freely. The vehicle and emulsifying agent shall burn off leaving no carbonaceous residue and shall not cause carburization of the panel.

3.4 Shelf Life: Shall be not less than 6 months; not more than thorough mixing shall be required to restore paste for use during that time.

3.5 Quality: Paste, as received by purchaser, shall be uniform in quality and condition and free from foreign materials and from imperfections detrimental to its working qualities. Paste, diluted with water or ethylene glycol as required, shall have acceptable application characteristics.

3.6 Sizes and Tolerances: The active ingredients shall be of such fineness that not more than 0.5% by weight shall be retained on a No. 325 ($45\text{ }\mu\text{m}$) screen, determined in accordance with ASTM B214 or by other method agreed upon by purchaser and vendor.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the paste shall supply all
Ø samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the paste conforms to the requirements of this specification.

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

4.3 Sampling: Shall be in accordance with the following; a lot shall be the
Ø paste produced from a single lot of powder combined with binder from the same manufacturing 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 paste shall furnish with each shipment three copies of a
Ø 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, lot number, AMS 3430A, and quantity from each lot.

4.4.2 When assemblies requiring use of this paste are supplied, the assembly
Ø manufacturer shall inspect each lot of paste to determine conformance to the technical requirements of this specification and shall furnish with each shipment three copies of a report stating that the paste conforms. This report shall include the purchase order number, AMS 3430A, assembly number, and quantity.

4.5 Resampling and Retesting: If any specimen used in the above tests fails to
Ø meet the specified requirements, disposition of the paste 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 paste represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

- 5.1 Identification: Each exterior container shall be permanently and legibly marked to show not less than the following information:

BRAZING FILLER METAL, PASTE, COPPER

AMS 3430A

TRADE NAME _____

VOLUME OF CONTENTS _____

DATE OF MANUFACTURE _____

LOT NUMBER _____

MANUFACTURER'S IDENTIFICATION _____

DIRECTIONS FOR APPLICATION _____

- 5.2 Packaging:

5.2.1 Unless otherwise specified, paste shall be supplied in 1 pt (0.5 L) glass or plastic jars or tin-coated cans, 1 gal (4 L) steel pails, or 5 gal (20 L) steel pails, as ordered.

5.2.2 Containers of the paste shall be suitably wrapped, sealed, and boxed or otherwise packaged for protection against injury and contamination during shipment and under normal dry storage conditions.

5.2.3 Packages of paste shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the paste to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

5.2.4 For direct U.S. Military procurement, packaging shall be in accordance with MIL-C-3993, Level A or Level C, as specified in the request for procurement. Commercial packaging as in 5.2.1, 5.2.2, and 5.2.3 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS: Paste not conforming to this specification or to modifications authorized by purchaser will be subject to rejection.

8. NOTES:

8.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this specification.