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

# AEROSPACE MATERIAL SPECIFICATION

AMS 4766C
Superseding AMS 4766B
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UNS P07850

## BRAZING FILLER METAL, SILVER
85Ag - 15Mn
1760° - 1780°F (960° - 970°C) Solidus-Liquidus Range

1. SCOPE:

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

1.2 Application: Primarily for joining ferrous metals where high strength up to 800°F (425°C) for short-time service or up to 500°F (260°C) for long-time service is required, or for nonferrous metals except those having base of aluminum or magnesium.

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 B293 - Subsieve Analysis of Granular Metal Powders by Air Classification
ASTM E56 - Chemical Analysis of Silver Brazing 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 Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E56, by spectrographic methods in accordance with Federal Test Ø Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

| | min | max |
|---|---|---|
| Silver | 84.0 | 86.0 |
| Manganese | 14.0 | 16.0 |
| Other Elements, total (3.1.1) | -- | 0.15 |

Ø 3.1.1 Determination not required for routine acceptance.

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

Ø 3.2.1 Wire: Cold drawn or cold rolled, as ordered, in annealed temper, and cleaned.

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

3.2.3 Sheet and Strip: Cold rolled, hard.

3.2.4 Pig, Powder, Shot, and Chips: As fabricated.

3.3 Properties: Filler metal shall conform to the following requirements:

3.3.1 Color: Shall be white.

3.3.2 Flatness: When unrolled, strip shall lie flat with no undue tendency to recoil.

3.4 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. Pig, powder, shot, and chips shall have a metallic luster.

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

3.5.1 Wire and Rod:

3.5.1.1 Nominal Diameters:

| Inch | (Millimetres) | Inch | (Millimetres) | Inch | (Millimetres) |
|---|---|---|---|---|---|
| 0.005 | (0.13) | 0.031 | (0.79) | 0.125 | (3.18) |
| 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) |

3.5.1.2 Diameter Tolerance for Drawn Wire and Rod: AMS 2224 as applicable to refractory alloys.

3.5.1.3 Diameter Tolerance for Rolled or Extruded Wire and Rod:

TABLE I

| Nominal Diameter or Distance Between Parallel Sides Inch | Tolerance, Inch Plus and Minus | |
|---|---|---|
| | Rounds | Squares |
| 0.031 to 0.062, incl | 0.005 | -- |
| Over 0.062 to 0.125, incl | 0.006 | -- |
| Over 0.125 to 0.188, incl | 0.007 | 0.009 |
| Over 0.188 to 0.250, incl | 0.008 | 0.010 |

TABLE I (SI)

| Nominal Diameter or Distance Between Parallel Sides Millimetres | Tolerance, Millimetre Plus and Minus | |
|---|---|---|
| | Rounds | Squares |
| 0.79 to 1.57, incl | 0.13 | -- |
| Over 1.57 to 3.18, incl | 0.15 | -- |
| Over 3.18 to 4.78, incl | 0.18 | 0.23 |
| Over 4.78 to 6.35, incl | 0.20 | 0.25 |

3.5.2 Sheet and Strip:

3.5.2.1 Nominal Thicknesses:

| Inch | (Millimetre) | Inch | (Millimetre) |
|---|---|---|---|
| 0.001 | (0.03) | 0.006 | (0.15) |
| 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) |

3.5.2.2 Tolerances: Thicknesses under 0.002 in. (0.05 mm) shall have a tolerance of ±0.0002 in. (±0.005 mm); thicknesses 0.002 in. (0.05 mm) and over shall have tolerances conforming to AMS 2222 as applicable to refractory alloys. Width of individual rolls shall not vary more than ±0.010 in. (±0.25 mm) from nominal width ordered. The length in a roll is not limited except that no roll shall weigh more than 75 lb (34 kg).

3.5.3 Powder:

3.5.3.1 Nominal Sizes: -60, -100, -200, and -325.

3.5.3.2 Ø Tolerances: Nominal sizes shown in 3.5.3.1 shall be supplied in accordance with the following tolerances on particle size distribution, determined in accordance with ASTM B214:

| Nominal Size | Not Less Than 95% Through U. S. Sieve Series Number | Not More Than 10% Through U. S. Sieve Series Number |
|---|---|---|
| -60 | 60 | 200 |
| -100 | 100 | 325 |
| -200 | 200 | 400 |
| -325 | 325 | As in 3.5.3.2.1 |

3.5.3.2.1 Ø Not more than 10% finer than a 10 micron particle size, determined in accordance with ASTM B293.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Ø 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 Ø Sampling: Shall be in accordance with the following; a lot shall be all product other than powder produced from a single furnace charge and presented for vendor's inspection at one time; a lot of powder shall be that product produced from a uniform blend of powder produced from one or more furnace charges and presented for vendor's inspection at one time:

Ø 4.3.1 Composition: One sample from each lot.

Ø 4.3.2 Properties: One sample from each lot.

Ø 4.3.3 Other Technical Requirements: As agreed upon by purchaser and vendor.

4.4 Reports:

4.4.1 Ø The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests 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, 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.