



AEROSPACE MATERIAL

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

SPECIFICATION

AMS 4185B

Superseding AMS 4185A

Issued 6-1-51
Revised 1-15-78

FILLER METAL, ALUMINUM BRAZING 12Si (4047)

1. SCOPE:

- 1.1 Form: This specification covers an aluminum alloy in the form of wire, sheet, pig, grains, shot, and chips.
- 1.2 Application: Primarily for joining aluminum by brazing, particularly by molten flux (dip) brazing procedure.

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 2202 - Tolerances, Aluminum-Base and Magnesium-Base Alloy Sheet and Plate
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 E34 - Chemical Analysis of Aluminum and Aluminum-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 Standards:

MIL-STD-649 - Aluminum and Magnesium Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

SAE Technical Board rules provide that: "All technical reports, including standards approved practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against infringement of patents."

3.1 **Composition:** Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E34, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other approved analytical methods:

	min	max
Silicon	11.0	13.0
Iron	--	0.8
Copper	--	0.30
Zinc	--	0.20
Manganese	--	0.15
Magnesium	--	0.10
Other Impurities, each	--	0.05
Other Impurities, total	--	0.15
Aluminum	remainder	

3.2 **Condition:** Filler metal shall be furnished in the following condition:

3.2.1 **Round Wire, Flattened and Slit Wire, and Sheet:** Annealed.

3.2.2 **Pig, Grains, Shot, and Chips:** As fabricated.

3.3 **Quality:** Filler metal, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to usage of the filler metal.

3.4 **Standard Sizes and Tolerances:** Unless otherwise specified, filler metal shall be supplied in the following standard sizes and to the tolerances shown:

3.4.1 **Round Wire:**

<u>Nominal Diameters</u>		<u>Tolerance, Plus and Minus</u>	
Inch	(Millimetres)	Inch	(Millimetres)
1/32	(0.8)	0.001	(0.03)
1/16	(1.6)	0.001	(0.03)
3/32	(2.4)	0.0015	(0.038)
1/8	(3.2)	0.0015	(0.038)
3/16	(4.8)	0.0015	(0.038)
1/4	(6.4)	0.0015	(0.038)

3.4.2 **Flattened and Slit Wire:** Cross-section 0.020 in. \pm 0.001 x 2 in. \pm 0.006 (0.51 mm \pm 0.3 x 51 mm \pm 0.15).

3.4.3 **Sheet:** Nominal thicknesses 0.10, 0.15, 0.020 in (0.25, 0.38, 0.51 mm); tolerances shall be as specified in AMS 2202.

4. QUALITY ASSURANCE PROVISIONS:

4.1 **Responsibility for Inspection:** The vendor of filler metal 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 filler metal 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.

4.3 **Sampling:** Shall be in accordance with the following; a lot shall be all filler metal produced from a single furnace charge:

4.3.1 Composition: At least one sample shall be taken by the producer from each group of ingots poured
Ø simultaneously from the same source of molten metal.

4.3.1.1 Unless compliance with 4.3.1 is established, an analysis shall be made for each 6000 lb (2724 kg)
Ø or less of material comprising a lot.

4.4 Reports:

4.4.1 The vendor of filler metal shall furnish with each shipment three copies of a report stating that the
Ø filler metal conforms to the chemical composition and other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, form and size or part number, and quantity.

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 sample used in the above tests fails to meet the specified requirements, disposition of the filler metal may be based on the results of testing two additional samples
Ø for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the filler metal represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification:

Ø 5.1.1 Filler metal shall be identified as agreed upon by purchaser and vendor.

5.1.2 Each container or package shall be permanently and legibly marked to show not less than the following information:

FILLER METAL, ALUMINUM B
AMS 4185B
Ø LOT NUMBER _____
MANUFACTURER'S IDENTIFICATION _____
NOMINAL DIMENSIONS _____
WEIGHT _____

5.2 Packaging:

5.2.1 Filler metal shall be suitably wrapped, sealed, and boxed or otherwise packaged for protection
Ø against injury and contamination, during shipment and storage, under normal dry storage conditions.

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

5.2.3 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-649, Level A
Ø or Level C, as specified in the request for procurement. Commercial packaging as in 5.2.1 and 5.2.2 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.