

AEROSPACE MATERIAL SPECIFICATION

Issued	DEC 1974
Noncurrent	OCT 1984
Reaffirmed	MAY 1995
Cancelled	FEB 2005

Superseding AMS 3416A

Flux, Aluminum Dip Brazing
1090°F (588°C), Fusion Point

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of February, 2005. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specifications indicating that it has been "CANCELLED".

Cancelled specifications are available from SAE upon request.

Similar but not necessarily identical product is covered in the following specification: AMS 3415 Flux, Aluminum Dip Brazing, 1030°F Fusion Point. However, this listing is provided for information only and does not constitute authority to substitute this specification for the "CANCELLED" specification.

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This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 10-8-84 for the following reasons:

1. The specification duplicates AMS 3415A as a dip brazing flux specification and is unnecessary.
2. The melting point range specified therein (1035° - 1090°F) is too high for practical aluminum dip brazing operations.
3. The higher cost of the lower melting temperature salts is insignificant when compared with the impracticality and the higher operating costs associated with the higher melting temperature salts.
4. AMS 3416 is referred to in AMS 2672D (par. 3.1.2) as the flux to be used in furnace brazing, creating a conflict as to the intent of AMS 3416.

It is recommended that this specification not be specified for new designs. This cover sheet should be attached to the "A" revision of the subject specification.

The following specification should be considered for applications where AMS 3416 would have been suitable:

1. SCOPE:

1.1 Form: This specification covers an aluminum brazing flux in granular **form**.

1.2 Application: Primarily **for** dip brazing **of** aluminum **and aluminum alloys at temperatures above 1100° F (593° C)**.

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**.

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

2.1.1 Aerospace Material Specifications:

AMS 4001 - **Aluminum Sheet and Plate (1100-o)**

3. TECHNICAL REQUIREMENTS:

3.1 Material: The flux shall be a **uniformly blended** mixture, primarily metallic chlorides with the addition of metallic fluorides, and **shall** contain not more than 5% by weight of water.

3.1.1 The flux shall have acceptable fusibility **and** acceptable application **and fluxing** characteristics, and shall **produce** satisfactory brazed joints of any type on aluminum or aluminum alloys **when used** in conjunction with aluminum brazing alloys.

3.2 Properties:

3.2.1 On heating, flux shall fuse at **1035° - 1090°F (557.2° - 587.8° C)**; on cooling from 1110° F (593° C) or higher, flux shall remain in the fluid state until the temperature drops to 1035° - 1090° F (557. 2° - 587.8° C).

3.2.2 Flux shall not erode parent metal to an extent greater than indicated by the following test:

3.2.2.1 A coupon of AMS 4001 aluminum, or equivalent, 0.025 x 1 x 6 in. (0.63 x 25 x 152 mm), immersed for 2 min. + 0.2 in a bath of dehydrated molten flux at 1120° F ± 10 (604. 4° C ± 5.6) shall not be reduced more than 0.001 in. (0.025 mm) in thickness.

3.2.3 Flux adhering to brazed assemblies should be removed by water at 190° F (88° C) or hotter. If the flux is not completely removed by the hot water but is removed by immersion in a 10% solution of nitric acid, to which 0.25% hydrofluoric acid is added, for not more than 15 min. at not higher than 100° F (38° C), followed by a final hot water rinse, the flux will be acceptable.

3.3 Quality: Flux shall be free from all substances which might affect its serviceability. Flux shall not contain any metallic chlorides or fluorides that deposit corresponding metals on the aluminum assembly during brazing.

4. QUALITY ASSURANCE PROVISIONS:

- 4.1 Responsibility for Inspection: The vendor of flux 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 4.5. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that the flux 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 or routine control tests.
- 4.3 Sampling: At least one randomly selected sample of flux *per* batch shall be used for testing. A batch shall be all material in an identifiable quantity processed at one time and presented for inspection at one time.
- 4.4 Approval:
- 4.4.1 Sample flux shall be approved by purchaser before flux for production use is supplied, unless such approval be waived. Results of tests on production flux shall be essentially equivalent to those on the approved sample.
- 4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production flux which are essentially the same as those used on the approved sample flux. If any change is necessary in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the revised materials and processing and, when requested, sample flux. No production flux made by the revised procedure shall be shipped prior to receipt of reapproval.
- 4.5 Reports: The vendor of flux shall furnish with each shipment three copies of a report stating that the flux conforms to the technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, batch number, date of manufacture, and quantity.
- 4.6 Resampling and Retesting: If any sample used in the above tests fails to meet the specified requirements, disposition of the flux may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the flux represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

- 5.1 Identification: Each package shall be permanently and legibly marked to give the following information:

FLUX, ALUMINUM DIP BRAZING
AMS 3416A
PURCHASE ORDER NUMBER _____
MANUFACTURER'S NAME _____
MANUFACTURER'S DESIGNATION _____
BATCH NUMBER _____
DATE OF MANUFACTURE _____
DIRECTIONS FOR MIXING AND APPLICATION _____
WEIGHT OF CONTENTS _____