

COMPOUND, ALKALINE RUST REMOVER  
Aircraft Turbine Engine Components

RATIONALE

This document has been reaffirmed to comply with the SAE 5-year Review policy.

1. SCOPE:

1.1 Form:

This specification covers an alkaline rust remover compound in the form of a liquid concentrate or a water-soluble powder for dilution with water.

1.2 Application:

This product has been used typically for removing rust, soils, or other oxidation products from aircraft turbine engine parts by immersion in a solution of the compound at elevated temperature, but usage is not limited to such applications. These compounds are unsuitable for cleaning aluminum parts. Restrictions for cleaning titanium parts may be imposed by the engine manufacturer.

1.3 Classification:

Compounds conforming to this specification are classified as follows:

- Type 1 - Liquid concentrate
- Type 2 - Water-soluble powder

1.3.1 Type 1 shall be supplied unless Type 2 is ordered.

1.4 Precautions:

Remover compound may contain chemicals which, if improperly used, could be hazardous to the health and safety of operators. Protective clothing including eye shields, suitable gloves, and apron should be worn when preparing and using compound. Tanks shall be prepared and operated under conditions of adequate fume extraction and with due regard to the safety recommendations of the manufacturer of the compound together with local workshop safety regulations.

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### 1.5 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

### 2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

#### 2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2825 Material Safety Data Sheets  
ARP1755 Effect of Cleaning Agents on Aircraft Engine Materials, Stock Loss Test Method

#### 2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM D 1568 Sampling and Chemical Analysis of Alkyl benzene Sul fonates  
ASTM D 2667 Biodegradability of Alkyl benzene Sul fonates  
ASTM F 945 Stress Corrosion of Titanium Alloys by Aircraft Engine Cleaning Materials

#### 2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-2073-1 DOD Materiel, Procedures for Development and Application of Packaging Requirements

### 3. TECHNICAL REQUIREMENTS:

#### 3.1 Composition:

The composition of the compound shall be optional with the manufacturer except that, when prepared for use, the solution shall be alkaline. When prepared in accordance with manufacturer's instructions, the compound shall form a liquid product, with no solid sediment at room temperature and shall meet the requirements of 3.2.

### 3.2 Properties:

The compound shall conform to the following requirements; tests shall be performed in accordance with specified test methods on the product supplied at the maximum concentration and temperature recommended by the manufacturer.

- 3.2.1 Stock Loss: Test panels of alloys or electrodeposits shall not incur stock loss exceeding 0.00025 inch (0.635  $\mu\text{m}$ ) per surface and plasma deposited coatings shall not incur stock loss exceeding 0.0001 inch (2.5  $\mu\text{m}$ ), when tested in accordance with ARP1755, Category 2. Stock loss figures shall be reported for all materials specified in ARP1755, Category 2. Vendor shall indicate where compound is not recommended for particular alloys or coatings.
- 3.2.2 Surface Attack: Test panels and bars used for the stock loss test of 3.2.1 shall neither exhibit pitting corrosion nor show visual evidence of degradation, when examined at 50X magnification under good oblique surface lighting conditions.
- 3.2.3 Biodegradability: Vendor shall supply evidence that surfactants used in the compound are at least 90% biodegradable, determined either in accordance with ASTM D 2667 where relevant to surfactant type or by alternative methods appropriate to surfactant type acceptable to purchaser.
- 3.2.3.1 Evidence of surfactant biodegradability does not guarantee that the compound may be discharged in either concentrated or diluted form into public waterways or sewerage systems; manufacturers shall give advice on the means for disposal.
- 3.2.4 Storage Stability: Compound, stored at 25 °C  $\pm$  5 (77 °F  $\pm$  9) for one year from date of receipt by purchaser, shall show no visual evidence of deterioration and shall meet all other technical requirements of this specification.
- 3.2.5 Stress-Corrosion of Titanium Alloys: The compound, when used at the (R) required concentrations, shall not cause stress-corrosion cracking of titanium alloys, determined in accordance with ASTM F 945, Method A or Method B.
- 3.2.6 Performance: The compound, prepared and used in accordance with (R) manufacturer's instructions, shall be capable of removing soils, rust, and other oxidation products from all required parts. Compounds which meet all other technical requirements of this specification shall be service tested in an approved engine overhaul facility for not less than six months, during which time at least ten turbofan or turbojet engines, or equivalent, shall be processed with satisfactory results before approval for service use is granted by the applicable engine manufacturer.

### 3.3 Quality:

The liquid compound, as received by purchaser, shall be homogeneous, and free from solid particles, separation, and any foreign material detrimental to usage of the compound. If compound is supplied in powder form, it shall be free flowing, free from lumping caused by moisture absorption, and free from foreign materials detrimental to its usage.

## 4. QUALITY ASSURANCE PROVISIONS:

### 4.1 Responsibility for Inspection:

(R)

The vendor of the compound shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the compound conforms to the requirements of this specification.

### 4.2 Classification of Tests:

(R)

Tests for all technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of compound to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.

### 4.3 Sampling and Testing:

(R)

Sufficient compound shall be selected in accordance with ASTM D 1568, or other procedure specified by purchaser. A lot shall be all compound produced in a single production run from the same batches of raw materials under the same fixed conditions and presented for vendor's inspection at one time. An inspection lot shall not exceed 6000 gallons (22,712 L) if a liquid or 10,000 pounds (4536 kg) if a powder.

### 4.4 Approval:

4.4.1 Sample compound shall be approved by purchaser before compound for production use is supplied, unless such approval be waived by purchaser. Results of tests on production compound shall be essentially equivalent to those on the approved sample.

4.4.1.1 A new or revised compound may be conditionally approved pending completion of the storage stability test of 3.2.4. Full approval will be granted following testing for the other technical requirements after completion of storage stability testing.

4.4.2 Vendor shall use ingredients, manufacturing procedures and processes, and methods of inspection on production compound which are essentially the same as those used on the approved sample compound. If necessary to make any change in ingredients or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample compound. Production compound made by the revised procedure shall not be shipped prior to receipt of reapproval.

#### 4.5 Reports:

The vendor of the compound shall furnish with the initial shipment of compound a report showing the results of tests to determine conformance to the technical requirements except that for a new or revised compound, the results of the storage stability test may be omitted. This report shall include the purchase order number, lot number, AMS 1379A, manufacturer's identification, and quantity.

4.5.1 A material safety data sheet conforming to AMS 2825, or equivalent, shall be supplied to each purchaser prior to, or concurrent with, the report of preproduction test results or, if preproduction testing be waived by purchaser, concurrent with the first shipment of compound for production use. Each request for modification of compound formulation shall be accompanied by a revised data sheet for the proposed formulation.

4.5.2 A bulletin describing the compound and method of use shall be provided by the compound manufacturer. This bulletin shall provide purchaser with detailed instructions for use of the compound, including mixing instructions, material compatibility, control analysis procedures, necessary safety practices, and precautions pertaining to hazardous ingredients.

4.5.3 The vendor of the compound shall furnish with each subsequent shipment a report stating that the compound is of the same basic composition and has essentially the same properties as the approved sample compound. If results of the storage stability test were submitted previously, these results may be used again and the test may be omitted. This report shall include the purchase order number, lot number, AMS 1379A, manufacturer's identification, and quantity. If compound from more than one lot is supplied in one shipment, a report shall be supplied for each lot of compound in the shipment.

#### 4.6 Resampling and Retesting: (R)

If any sample used in the above tests fails to meet the specified requirements, disposition of the compound 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 compound represented. Results of all tests shall be reported.