

AEROSPACE MATERIAL SPECIFICATION

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Superseding AMS 1387

Remover, Anti-Galling Compound
Aircraft Turbine Engine Components
Room Temperature Application

1. SCOPE:

1.1 Form:

This specification covers an anti-galling compound remover in the form of a water-soluble powder, a concentrated liquid for dilution with water, or a ready-to-use liquid.

1.2 Application:

This remover has been used typically for removal of anti-galling compounds from turbine engine components by immersion at room temperature in a solution of the remover or ready-to-use liquid, but usage is not limited to such applications. This remover shall not be used on steel parts having hardness of 40 HRC or over.

1.3 Classification:

Remover conforming to this specification is classified as follows:

Type 1 - Water-soluble powder

Type 2 - Liquid concentrate

Type 3 - Ready-to-use liquid

1.3.1 Type 1 shall be supplied unless Type 2 or Type 3 is ordered.

1.4 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.

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1.5 Precautions:

Remover 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 remover. 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 remover together with local workshop safety regulations.

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 Alkylbenzene Sulfonates

ASTM D 2667 Biodegradability of Alkylbenzene Sulfonates

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:

Shall be optional with the manufacturer but, when prepared in accordance with manufacturer's instructions, shall form a liquid product, with no solid sediment at room temperature, meeting the applicable requirements of 3.2.

- 3.1.1 Remover containing volatile solvents shall be provided with an upper liquid seal serving to retard evaporation of solvents from the lower working layer. Solution make up, depth of seal if required, and solution control for the lower and seal phases shall be in accordance with manufacturer's instructions and purchaser's requirements.
- 3.2 Properties:
- Remover 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; if a seal is specified, tests shall be performed on the lower liquid layer through the seal:
- 3.2.1 Stock Loss: Test panels of alloys or electrodeposits shall not incur stock loss exceeding 0.000025 inch (0.635 μm) per surface and plasma deposited coatings shall not incur stock loss exceeding 0.0001 inch (2.5 μm) when tested in accordance with ARP1755, Category 9. Where required in ARP1755, stock loss figures shall be reported. Vendor may indicate where remover is not recommended for particular alloys or surface coatings.
- 3.2.2 Pitting and Intergranular 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 remover shall be 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 remover 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: Remover stored at 25 °C \pm 5 (77 °F \pm 9) for one year shall show no visual evidence of deterioration and shall meet all other technical requirements.
- 3.2.5 Stress-Corrosion of Titanium Alloys: Remover shall not cause corrosion of titanium alloys, (R) determined in accordance with ASTM F 945, Method A or Method B.
- 3.2.6 Performance: The remover, prepared and used in accordance with manufacturer's instructions, shall remove anti-galling compounds from parts. Products which meet all other technical requirements shall be tested for anti-galling-compound-removal performance in an approved engine overhaul facility for not less than six months, during which time at least ten turbopan 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 remover, as received by purchaser, if a liquid, shall be clear, homogeneous, and free from solid particles and separation and from foreign materials detrimental to usage of the remover, and if a powder form, 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 remover 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 remover conforms to the requirements of this specification.

4.2 Classification of Tests:

Tests for all technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of remover 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)

Shall be in accordance with ASTM D 1568 or other method acceptable to purchaser. A lot shall be all remover 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 6,000 gallons (22,712 L) if a liquid or 25,000 pounds (11,340 kg) if a powder.

4.4 Approval:

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

4.4.1.1 A new or revised remover 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 methods of inspection on production remover which are essentially the same as those used on the approved sample remover. 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 remover. Production remover made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports:

4.5.1 The vendor of remover shall furnish with the initial shipment a report showing the results of tests to determine conformance to the technical requirements except that for a new or revised remover, the results of the storage stability test may be omitted. This report shall include the purchase order number, lot number, AMS 1387A, manufacturer's identification, and quantity.

4.5.1.1 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 remover for production. Each request for modification of remover formulation shall be accompanied by a revised data sheet for the proposed formulation.

4.5.2 The vendor of remover shall furnish with each subsequent shipment a report stating that the remover is of the same composition and has the same properties as the approved sample remover. If results of the storage stability test were not included in the report on the initial shipment of remover, results of that test shall be included in the report on the first shipment following completion of that test. This report shall include the purchase order number, lot number, AMS 1387A, manufacturer's identification, and quantity. If remover from more than one lot is supplied in one shipment, a report shall be supplied for each lot of remover in the shipment.

4.5.3 A bulletin describing the remover and detailed instructions for its use shall be provided by the remover manufacturer. The bulletin shall also include at least mixing instructions, material compatibility, properties, control/analysis procedures, and safety practices including precautions for hazardous ingredients.

4.6 Resampling and Retesting:

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

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Remover shall be packaged in containers of a type and size acceptable to purchaser.