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400 Commonwealth Dr., Warrendale, PA 15096

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 1545

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Submitted for recognition as an American National Standard

CLEANER, THRUST REVERSER
Alkaline, Water-Base

1. SCOPE:

1.1 Form: This specification covers an alkaline-type, water-base cleaner in the form of a liquid.

1.2 Application: Primarily for removing stains and carbon deposits from corrosion and heat resistant steel and titanium alloy thrust reverser parts. This cleaner will etch aluminum. If an aluminum-safe cleaner is required, AMS 1540 should be used.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications and Aerospace Recommended Practices shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 2825 - Material Safety Data Sheets
AMS 4911 - Titanium Alloy Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS 5045 - Steel Sheet and Strip, 0.25 max Carbon, Hard Temper

2.1.2 Aerospace Recommended Practices:

ARP 1511 - Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D56 - Flash Point by Tag Closed Tester
ASTM D1568 - Sampling and Chemical Analysis of Alkylbenzene Sulfonates
ASTM D2667 - Biodegradability of Alkylbenzene Sulfonates
ASTM F483 - Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F503 - Preparing Aircraft Cleaning Compounds, Liquid Type, for Storage Stability Testing
ASTM F519 - Mechanical Hydrogen Embrittlement Testing of Plating Processes and Aircraft Maintenance Chemicals

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

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

3. TECHNICAL REQUIREMENTS:

3.1 Material: The composition of the cleaner shall be optional with the manufacturer but should contain water, biodegradable surfactants, and other additives as required to produce a homogeneous product meeting the requirements of 3.2.

3.2 Properties: Cleaner shall conform to the following requirements; tests shall be performed in accordance with specified test methods on the product in concentrated form except as otherwise specified herein:

3.2.1 Corrosion of Metal Surfaces:

3.2.1.1 Total Immersion Corrosion: The product shall neither show evidence of corrosion nor cause a weight change of any test panel greater than the following, determined in accordance with ASTM F483:

Test Panel	Weight Change mg/cm^2 per 24 hr
AMS 5045 Carbon Steel	0.8
AMS 4911 Titanium Alloy	0.1

3.2.1.2 Low-Embrittling Cadmium Plate: Test panels with low-embrittling cadmium plate shall not show a weight change greater than 0.3 mg/cm^2 per 24 hr, determined in accordance with ARP 1511.

3.2.2 Hydrogen Embrittlement: The cleaner shall be non-embrittling, determined in accordance with ASTM F519, Type 1a, 1c, or 2a.

3.2.3 Flash Point: Shall be not lower than 60°C (140°F), determined in accordance with ASTM D56.

3.2.4 Solubility: Cleaner shall be completely soluble in water to make a uniform solution free of gelatinous lumps, layering of ingredients, and sediment. There shall be no violent or dangerous reactions when cleaner is diluted according to manufacturer's recommendations.

3.2.5 Storage Stability: Cleaner shall neither show separation from exposure to heat or cold nor show an increase in turbidity greater than a control sample, determined in accordance with ASTM F503.

3.2.6 Biodegradability: Surfactants used shall be not less than 90% biodegradable, determined in accordance with ASTM D2667. The vendor of the cleaner shall obtain certification from surfactant manufacturer of the percent biodegradability of the surfactant.

3.2.7 Performance: Cleaner, when used in accordance with manufacturer's recommandations, shall remove carbon deposits and stains normally found on corrosion and heat resistant steel and titanium alloy thrust reverser parts. Standards for acceptance and test methods shall be as agreed upon by purchaser and vendor.

3.3 Quality: The cleaner, as received by purchaser, shall be a homogeneous liquid, free from sediment, abrasives, skins, lumps, and foreign materials detrimental to usage of the cleaner.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of cleaner shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the cleaner conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for total immersion corrosion (3.2.1.1) and flash point (3.2.3) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for low-embrittling cadmium plate (3.2.1.2), hydrogen embrittlement (3.2.2), solubility (3.2.4) and performance (3.2.7) are classified as periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

4.2.3 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of cleaner to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.3.1 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, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be in accordance with ASTM D1568; a lot shall be all cleaner 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. A lot may be packaged and delivered in small quantities under the basic lot approval provided lot identification is maintained.

4.3.1 When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3 and the report of 4.5 shall state that such plan was used.

4.4 Approval:

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

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

4.5 Reports: Unless waived by purchaser, the vendor of cleaner shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and, when performed, to the periodic test requirements and stating that cleaner conforms to the other technical requirements of this specification. This report shall include purchase order number, AMS 1545, manufacturer's identification, lot number, 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 tests results or, if preproduction testing be waived by purchaser, concurrent with the first shipment of cleaner for production use. Each request for modification of cleaner formulation shall be accompanied by a revised data sheet for the proposed formulation.