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

AEROSPACE MATERIAL SPECIFICATION

AMS 1532

Issued 1-15-78
Revised

CLEANER FOR AIRCRAFT EXTERIOR SURFACES
Wipe-on, Wipe-off, Emulsion-Type

1. SCOPE:

1.1 Form: This specification covers an emulsion-type cleaner in the form of a liquid.

1.2 Application: Primarily for removing soils from painted and unpainted exterior surfaces of aircraft by a wipe-on, wipe-off procedure not requiring a water rinsing operation.

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) and Aerospace Recommended Practices (ARP) 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 2350 - Standards and Test Methods
AMS 4049 - Aluminum Alloy Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.26Cr (Alclad 7075; -T6 Sheet, -T651 Plate)
AMS 4376 - Magnesium Alloy Plate, 3.0Al - 1.0Zn (AZ31B-H26)
AMS 4911 - Titanium Alloy Sheet, Strip, and Plate (6Al - 4V), Annealed

2.1.2 Aerospace Recommended Practices:

ARP 1511 - Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals
ARP 1512 - Corrosion of Aluminum Alloys by Aircraft Maintenance Chemicals, Sandwich Test
ARP 1525 - Hydrogen Embrittlement Effect on Metals by Aircraft Maintenance Chemicals, Mechanical Test Methods

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

ASTM A109 - Steel, Carbon, Cold-Rolled Strip
ASTM E56 - Flash Point by Tag Closed Tester
ASTM D1404 - Estimation of Deleterious Particles in Lubricating Grease
ASTM F483 - Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F484 - Stress Craze Test of Acrylic Plastics in Contact with Liquid and Semi-Liquid Compounds
ASTM F485 - Effects of Cleaners on Unpainted Aircraft Surfaces
ASTM F502 - Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces
ASTM F503 - Preparing Aircraft Cleaning Compounds, Liquid Type, for Storage Stability Testing

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120 except as specified in 2.3.3.

2.3.1 Military Specifications:

MIL-C-23377 - Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant
MIL-P-25690 - Plastic, Sheets and Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant
MIL-C-81773 - Coating, Polyurethane, Aliphatic, Weather Resistant

2.3.2 Military Standards:

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

2.3.3 U.S. Department of Labor, Occupational Safety and Health Administration Forms: Available from regional offices of U.S. Department of Labor, Bureau of Labor Standards.

OSHA Form 20 - Material Safety Data Sheet

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall consist of a mixture of selected solvents, detergents, soaps, and water, either with or without thickening agents, to produce an emulsion-type product meeting the requirements of 3.2.

3.2 Properties: The cleaner shall conform to the following requirements; tests shall be performed in accordance with specified test methods on the product as-received in concentrated form and, when specified, at use dilution recommended by the manufacturer:

3.2.1 Corrosion of Metal Surfaces:

3.2.1.1 Sandwich Corrosion: Specimens, after test, shall show a rating not worse than 1, determined in accordance with ARP 1512.

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

Test Panel	Weight Change mg/cm^2/24 hr
AMS 4049 Aluminum Alloy	0.4
AMS 4376 Magnesium Alloy	0.8
AMS 4911 Titanium Alloy	0.1
ASTM A109, Temper No. 5, Carbon Steel	1.0

3.2.1.3 Low-Embrittling Cadmium Plate: Test panels coated with low-embrittling cadmium plate shall not show a weight change greater than 1.0 mg/cm^2/24 hr, determined in accordance with ARP 1511.

3.2.2 Hydrogen Embrittlement: The product shall be non-embrittling, determined in accordance with ARP 1525.

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

3.2.4 Effect on Plastics: The product, at use dilution recommended by the manufacturer, shall not craze, stain, or discolor MIL-P-25690 stretched acrylic plastic, determined in accordance with ASTM F484.

3.2.5 Effect on Painted Surfaces: The product shall neither decrease the hardness of the paint film by more than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

3.2.6 Effect on Unpainted Surfaces: The product, tested in accordance with ASTM F485, shall neither produce streaking nor leave any stains requiring polishing to remove.

3.2.7 Abrasive Effects: The product shall not scratch glass, paint, or aluminum alloy surfaces, determined in accordance with ASTM D1404 except that the test specimens shall be glass, AMS 4049 aluminum alloy, and AMS 4049 aluminum alloy coated with MIL-C-23377 epoxy primer and MIL-C-81773 polyurethane coating compound. The cleaner shall be applied to the specimens in the as-received concentrated form. Only arc-type scratches greater than 1/16 in. (1.6 mm) from the edge of any specimen shall be considered.

3.2.8 Storage Stability: The product, tested in accordance with ASTM F503, shall be restorable to its original appearance by vigorous shaking and shall conform to all other technical requirements of this specification after the storage stability period.

3.2.9 Performance: The product, when used in accordance with the manufacturer's recommendations, shall remove normally accumulated soils from the exterior surfaces of aircraft without leaving any visible residue on any surface tested.

3.3 Quality: The cleaner, as received by purchaser, shall be homogeneous, uniform in color, and free from skins and lumps and from foreign materials detrimental to usage of the cleaner.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the cleaner 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 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 total immersion corrosion (3.2.1.2), effect on painted surfaces (3.2.5), and effect on unpainted surfaces (3.2.6) are classified as acceptance tests.

4.2.2 Periodic Tests and Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as periodic tests and as preproduction tests.

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

4.3 Sampling: Sufficient cleaner shall be taken at random from each lot to perform all required tests in triplicate; 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 submitted for vendor's inspection at one time.

4.4 Approval: