SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 1531C

Issued JAN 1978
Revised MAR 2001

Superseding AMS 1531A

Cleaner for Aircraft Exterior Surfaces
Wipe-On, Wipe-Off, Containing Suspended Abrasive Solids

1. SCOPE:

1.1 Form:

This specification covers a water-soluble cleaner containing suspended abrasive solids in the form of a ready-to-use liquid.

1.2 Application:

This cleaner has been used typically for removing resistant soils from exhaust areas of exterior metal and painted surfaces of aircraft by a wipe-on, wipe-off procedure not requiring a water rinsing operation, but usage is not limited to such applications. NOT recommended for use on stretched or cast acrylic plastic.

1.3 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 issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.1 SAE Publications:

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

AMS 2475	Protective Treatments, Magnesium Alloys
AMS 4049	Aluminum Alloy Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075; -T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated
AMS 4376	Plate, Magnesium Alloy Plate, 3.0Al - 1.0Zn (AZ31B-H26), Cold Rolled and Partially Annealed
AMS 4911	Titanium Alloy Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS 5045	Steel Sheet and Strip, 0.25 Carbon, Maximum, Hard Temper

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 56	Flash Point by Tag Closed Tester
ASTM D 1404	Estimation of Deleterious Particles in Lubricating Grease
ASTM F 483	Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F 484	Stress Crazing of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds
ASTM F 485	Effects of Cleaners on Unpainted Aircraft Surfaces
ASTM F 502	Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces
ASTM F 519	Mechanical Hydrogen Embrittlement Testing of Plating Processes and Aircraft Maintenance Chemicals
ASTM F 1104	Preparing Aircraft Cleaning Compounds, Liquid Type, Water Base, for Storage Stability Testing
ASTM F 1110	Sandwich Corrosion Test
ASTM F 1111	Corrosion of Low Embrittling Cadmium Plate by Aircraft Maintenance Chemicals

2.3 U. S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

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-83286	Coating, Urethane, Aliphatic Isocyanate, for Aerospace Applications

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall consist of a mixture of selected solvents, mild abrasives, detergents, soaps, and water, either with or without thickening agents, to produce a 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:

3.2.1 Corrosion of Metal Surfaces:

3.2.1.1 Sandwich Corrosion: Specimens, after test, cleaner shall produce a rating not worse than 1, determined in accordance with ASTM F 1110.

3.2.1.2 Total Immersion Corrosion: The product shall neither show evidence of corrosion nor cause a weight change of any test panel greater than that shown in Table 1, determined in accordance with ASTM F 483:

TABLE 1 - Maximum Immersion Weight Change

Test Panel Material	Weight Change mg/cm^2 per 24 hours
AMS 4049 Aluminum Alloy	0.3
AMS 4376 Magnesium Alloy, Dichromate Treated as in AMS 2475	0.2
AMS 4911 Titanium Alloy	0.1
AMS 5045 Carbon Steel	0.8

3.2.1.3 Low-Embrittling Cadmium Plate: Panels coated with low-embrittling cadmium plate shall not show a weight change greater than 0.3 mg/cm^2 per 24 hours, determined in accordance with ASTM F 1111.

3.2.2 Hydrogen Embrittlement: The product shall be non-embrittling, determined in accordance with ASTM F 519, Type 1a, 1c, or 2a.

3.2.3 Flash Point: Shall be not lower than 60 °C (140 °F), determined in accordance with ASTM D 56.

3.2.4 Effect on Plastics: The product shall not craze, stain, or discolor MIL-P-25690 stretched acrylic plastic, determined in accordance with ASTM F 484.

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 F 502.

3.2.6 Effect on Unpainted Surfaces: The product, tested in accordance with ASTM F 485, shall neither produce streaking nor leave any stains requiring polishing to remove.

3.2.7 Abrasive Effects: The cleaner shall not scratch glass, paint, or aluminum alloy surfaces, determined in accordance with ASTM D 1404 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-83286 urethane coating. The cleaner shall be applied to the specimens in the as-received concentrated form. Only arc-type scratches greater than 1/16 inch (1.6 mm) from the edge of any specimen shall be considered.

3.2.8 Storage Stability: The product, tested in accordance with ASTM F 1104, 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 cleaner, when used in accordance with 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 for vendor's tests and shall be responsible for the performance of all required tests. 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: Total immersion corrosion (3.2.1.2), effect on painted surfaces (3.2.5), effect on unpainted surfaces (3.2.6), and quality (3.3) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Sandwich corrosion (3.2.1.1), low-embrittling cadmium plate (3.2.1.3), hydrogen embrittlement (3.2.2), flash point (3.2.3), effect on plastics (3.2.4), abrasive effects (3.2.7), storage stability (3.2.8), and performance (3.2.9) are 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: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of the cleaner 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.