AEROSPACE MATERIAL SPECIFICATION

AMS1534™	REV. C

Issued 1983-01
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Superseding AMS1534B

Cleaner, Aircraft Glass Window

RATIONALE

Changes in this revision include format/editorial changes as well update to specification revisions.

1. SCOPE

1.1 Form

This specification covers two types of aircraft glass window cleaners in the form of a ready-to-use liquid.

1.2 Application

Primarily for removing soils, contaminants, and residues from aircraft glass windows by manual application.

1.3 Classification

The cleaners covered by this specification shall be of the following types as ordered:

Type I - Regular

Type II - Antifogging

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.

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 cancelled and no superseding document has been specified, the last published issue of that document shall apply.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS1534C/

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS2350 Standards and Test Methods

AMS4041 Aluminum Alloy, Alclad Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn, Alclad 2024 and 1-1/2% Alclad 2024, -T3 Flat Sheet; 1-1/2% Alclad 2024-T351 Plate

AMS4049 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

AMS4376 Magnesium Alloy Plate, 3.0A1 - 1.0Zn (AZ31B-H26), Cold Rolled and Partially Annealed

ARP1511 Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D 56 Flash Point by Tag Closed Tester

ASTM D 1015 Freezing Points of High-Purity Hydrocarbons

ASTM D 1193 Reagent Water

ASTM D 1568 Sampling and Chemical Analysis of Alkylbenzene Sulfonates

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 503 Preparing Aircraft Cleaning Compounds, Liquid Type, for Storage Stability Testing

ASTM F 519 Mechanical Hydrogen Embrittlement Testing of Plating Processes and Aircraft Maintenance Chemicals

ASTM F 1111 Standard Test Method for Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals

2.3 U.S. Government Publications

Available from DLA Document Services, Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: (215) 697-6257, http://quicksearch.dla.mil/.

MIL-STD-2073-1 Standard Practice for Military Packaging

MIL-STD-870 Cadmium Plating, Low Embrittlement, Electro-Deposition

FED-STD-313 Material Safety Data Sheets, Preparation of

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall be optional with the manufacturer, shall be a homogenous liquid suitable for the intended usage, and shall meet 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 supplied:

3.2.1 Corrosion of Metal Surfaces

3.2.1.1 Total Immersion Corrosion

The cleaner shall neither show evidence of corrosion nor cause a weight change of any test panel greater than the following, determined in accordance with ASTM F 483:

TABLE 1

Test Panel	Weight Change mg/cm^2 per 24 hours
AMS4041 Aluminum Alloy	0.3
AMS4049 Aluminum Alloy	0.4
AMS4376 Magnesium Alloy	0.8

3.2.1.2 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 per 24 hours, determined in accordance with ASTM F 1111.

3.2.2 Effect on Plastics

The cleaner shall not craze, stain, or discolor transparent plastics, determined in accordance with ASTM F 484.

3.2.3 Effect on Painted Surfaces

The cleaner shall neither decrease the hardness of polyurethane or other paint films specified by purchaser 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.

3.2.4 Effect on Unpainted Surfaces

The cleaner, tested in accordance with ASTM F 485, shall neither produce streaking nor leave any stains requiring polishing to remove.

3.2.5 Hydrogen Embrittlement

The product shall be non-embrittling, determined in accordance with ASTM F 519, utilizing Type 1a, 1c, or 2a specimens, cadmium plated in accordance with MIL-STD-870, Class 1, Type I. Type 1a and Type 1c specimens shall be loaded to 45% of the predetermined notch fracture strength, and Type 2a specimens loaded to 80% of the yield strength. The entire 2a stressed specimen, or just the notched area of the 1a and 1c stressed specimen, shall be immersed continuously in the solution under test for 150 hours at a temperature between 20 and 30 °C (68 to 86 °F).

3.2.6 Flash Point

Shall be not lower than 158 °F (70 °C), determined in accordance with ASTM D 56.

3.2.7 Freeze Point

Shall be determined in accordance with ASTM D 1015 and the results reported.

3.2.8 Storage Stability

The cleaner shall neither show separation from exposure to heat or cold nor show an increase in turbidity greater than a control sample equally diluted to use concentration with ASTM D 1193, Type IV, water, determined in accordance with ASTM F 503.

3.2.9 Antifogging, Type II Only

The cleaner shall produce a definite antifogging action, determined in accordance with 3.2.9.1.

3.2.9.1 Make a 6 x 12 inch (152 x 305 mm) mirror test plate by splitting a standard 12 inch (305 mm) square mirror. Thoroughly clean the surface with isopropyl alcohol and rinse with ASTM D 1193, Type IV, water. A white highly-reflective appearance is taken on by the glass in those areas not thoroughly clean. Apply the cleaner to one-half of the surface by wiping until the surface is just damp and allow to dry. Hold the mirror 6 inches (152 mm) from a steam source (cool steam). There should be a definite difference between the two halves of the surface.

3.2.10 Performance

The cleaner, when used in accordance with manufacturer's recommendations, shall remove soils, contaminants, and residues from aircraft glass windows, determined by procedures agreed upon by purchaser and vendor.

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 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 effect on plastics (3.2.2) and effect on unpainted surfaces (3.2.4) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests

Tests to determine conformance to requirements for corrosion of metal surfaces (3.2.1), effect on painted surfaces (3.2.3), hydrogen embrittlement (3.2.5), flash point (3.2.6), freeze point (3.2.7), storage stability (3.2.8), and, for Type II, antifogging ability (3.2.9), 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 and/or processing 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, contracting officer, or request for procurement.