

Cleaner, Aircraft Glass Window

FOREWORD

Changes in this revision are format/editorial only.

1. SCOPE:

1.1 Form:

This specification covers two types of cleaner 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.

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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 4041	Aluminum Alloy Sheet and Plate, Alclad, 4.4Cu - 1.5Mg - 0.60Mn (Alclad 2024 and 1-1/2% Alclad 2024, -T3 Flat Sheet; 1-1/2% Alclad 2024-T351 Plate)
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	Magnesium Alloy Plate, 3.0A1 - 1.0Zn (AZ31B-H26), Cold Rolled and Partially Annealed

2.1.2 Aerospace Recommended Practices:

ARP1511	Corrosion of Low-Embrittling Cadmium Plate by Aircraft Maintenance Chemicals
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2.2 ASTM Publications:

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

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 Cracking 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.

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

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

Test Panel	Weight Change mg/cm ² per 24 hours
AMS 4041 Aluminum Alloy	0.3
AMS 4049 Aluminum Alloy	0.4
AMS 4376 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/cm² per 24 hours, determined in accordance with ARP1511.

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, Type 1a, 1c, or 2a.
- 3.2.6 Flash Point: Shall be not lower than 70°C (158°F), 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.
- 4.3 Sampling:
- Shall be in accordance with all applicable requirements of ASTM D 1568; a lot shall be all cleaner produced in one continuous manufacturing operation from the same batches of raw materials under the same fixed conditions and presented for vendor's inspection at one time.
- 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 methods of inspection on production cleaner which are essentially the same as those used on the approved sample. 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, 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:
- 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 the cleaner conforms to the other technical requirements of this specification. This report shall include the purchase order number, AMS 1534B, manufacturer's identification, lot number, and quantity.