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Superseding AMS 1535B

Cleaner, Transparent Plastic

1. SCOPE:

1.1 Form:

This specification covers a cleaner for plastics in the form of a liquid.

1.2 Application:

This cleaner has been used typically for removing soils, contaminants, and residues from interior and exterior surfaces of aircraft windows by manual application, but usage is not limited to such applications.

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.

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2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

| | |
|-------------|---|
| AMS 2401 | Cadmium Plating, Low Hydrogen Content Deposit |
| 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, 3.0Al - 1.0Zn (AZ31B-H26), Cold Rolled and Partially Annealed |
| AMS-P-83310 | Plastic Sheet, Polycarbonate, Transparent |

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or 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 Cracking of Acrylic Plastics in Contact with Liquid and 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 Evaluation of Plating Processes and Service Environments |
| ASTM F 1104 | Preparing Aircraft Cleaning Compounds, Liquid Type, Water Base for Storage Stability Testing |
| 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.

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| P-P-560 | Polish, Plastic |
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3. TECHNICAL REQUIREMENTS:

3.1 Material:

The composition of the cleaner shall be optional with the manufacturer but shall contain ingredients producing antistatic properties to cleaned surfaces and 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 supplied, both in concentrated form and at use dilution recommended by the manufacturer:

3.2.1 Corrosion of Metal Surfaces:

- 3.2.1.1 Total Immersion Corrosion: The cleaner shall neither produce evidence of corrosion of the panels 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 Corrosion Weight Change

| Test Panel Material | 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 in accordance with AMS 2401 shall not show a weight change greater than 1.0 mg/cm² per 24 hours, determined in accordance with ASTM F 1111.

- 3.2.2 Effect on Transparent Plastics: The cleaner shall not craze, stain, or discolor Type A or Type C acrylic plastics when tested in accordance with ASTM F 484. The cleaner shall not craze, stain, or discolor polysulfone plastic or AMS-P-83310 polycarbonate plastic, determined in accordance with test procedures specified in ASTM F 484 on specimens stressed for 30 minutes \pm 2 to an outer fiber stress of 2000 psi (13.8 MPa).

- 3.2.3 Antistatic Properties: The cleaned surfaces shall show no indication of static charge, tested in accordance with P-P-560.

- 3.2.4 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.
- 3.2.5 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.
- 3.2.6 Hydrogen Embrittlement: The product shall be non-embrittling, determined in accordance with ASTM F 519, Types 1a, 1c, or 2a.
- 3.2.7 Flash Point: Shall be not lower than 70 °C (158 °F), determined in accordance with ASTM D 56.
- 3.2.8 Freeze Point: Shall be determined in accordance with ASTM D 1015 and the results reported.
- 3.2.9 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 1104.

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 cleaner shall supply all samples for vendor's tests and shall be responsible for 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: Effect on transparent plastics (3.2.2) and effect on unpainted surfaces (3.2.5) are acceptance tests and shall be performed on each lot.
- 4.2.2 Periodic Tests: Corrosion of metal surfaces (3.2.1), antistatic properties (3.2.3), effect on painted surfaces (3.2.4), hydrogen embrittlement (3.2.6), flash point (3.2.7), freeze point (3.2.8), and storage stability (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 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.

4.3 Sampling and Testing:

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 lots of raw materials and presented for vendor's inspection at one time.

4.3.1 When a statistical sampling plan has 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 methods of inspection 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 ingredients and/or processing 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. This report shall include the purchase order number, lot number, AMS 1535C, manufacturer's identification, 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 test 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.