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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 1631B

Issued JAN 1978
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Submitted for recognition as an American National Standard

Superseding AMS 1631A

Cleaner, Carpet
Water Extraction Type

FOREWORD

Changes in this Reaffirm are editorial/format only.

1. SCOPE:

1.1 Form:

This specification covers one type of carpet cleaner in the form of a liquid.

1.2 Application:

This cleaner has been used typically with water extraction machines for in-place cleaning of aircraft carpets, 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.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7154 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 2825	Material Safety Data Sheets
AMS 4037	Aluminum Alloy Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate), Solution Heat Treated
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 4045	Aluminum Alloy Sheet and Plate, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075; -T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated
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

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 1193	Reagent Water
ASTM D 1335	Tuft Bind of Pile Floor Coverings
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 502	Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces
ASTM F 1104	Preparing Aircraft Cleaning Compounds, Liquid Type, Water Base, for Storage Stability Testing
ASTM F 1110	Sandwich Corrosion Test

2.3 U.S. Government Publications:

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

MIL-P-25690	Plastic Sheet and Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant
MIL-P-83310	Plastic Sheet, Polycarbonate, Transparent
MIL-STD-2073-1	DOD Materiel, Procedures for Development and Application of Packaging Requirements

2.4 Federal Aviation Administration Regulations:

Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

FAR Part 25 Airworthiness Standards; Transport Category Airplanes

2.5 AATCC Publications:

Available from American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.

AATCC Test Method 138 Washing of Textile Floor Coverings

2.6 CSMA Publications:

Available from Chemical Specialties Manufacturing Association, 1001 Connecticut Avenue, Washington, DC 20036.

CSMA Bulletin 308 Evaluating Resoiling Tendencies of Carpeting

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

The composition of the cleaner shall be optional with the manufacturer but shall yield a product conforming to 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 in concentrated form and, when specified, at use dilution recommended by the manufacturer using ASTM D 1193, Type IV, water for dilution.

3.2.1 Solubility: Cleaner shall be soluble in both hard and soft water and shall produce no detectable precipitate, determined in accordance with 3.2.1.1.

3.2.1.1 Prepare a solution of 1 mL of cleaner in 99 mL of ASTM D 1193, Type IV, water in a 100 mL glass-stoppered, graduated cylinder. Prepare a second sample of 1 mL of cleaner in 99 mL of synthetic tap water made up as in 3.2.1.1.1. Allow the two samples to stand undisturbed for not less than one hour and examine for evidence of scum or sediment.

3.2.1.1.1 Prepare a solution of synthetic tap water as shown in Table 1.

TABLE 1 - Synthetic Tap Water

Ingredient	Amount
AR Calcium Acetate, $Ca(C_2H_30_2)_2 \cdot 2H_20$	0.20 g ± 0.005
AR Magnesium Sulfate, $MgS0_4 \cdot 7H_20$	0.15 g ± 0.005
AR Sodium Chloride, NaC1	0.12 g ± 0.005
ASTM D 1193, Type III, Water	To make 1 liter

3.2.1.1.1.1 The pH of the reagent water shall be 6.5 to 7.5. The pH of the synthetic tap water solution shall be approximately 6.8 but within the range 6.5 to 7.5.

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

3.2.3 Corrosion of Metal Surfaces:

3.2.3.1 Sandwich Corrosion: Specimens of AMS 4045 and AMS 4049 aluminum alloy, after testing in accordance with ASTM F 1110 on cleaner both in the concentrated form and at use dilution, shall not show corrosion worse than control panels tested with ASTM D 1193, Type IV, water.

3.2.3.2 Total Immersion Corrosion: Cleaner, both in the concentrated form and at use dilution, shall neither cause evidence of staining, pitting, or discoloration of the panels nor cause a weight change of any panel greater than 0.3 mg/cm^2 per 24 hours, determined in accordance with ASTM F 483 on panels of AMS 4037, AMS 4045, and either AMS 4041 or AMS 4049 aluminum alloys.

3.2.4 Effect on Transparent Plastics:

3.2.4.1 Cleaner, both in the concentrated form and at use dilution, shall not craze, stain, or discolor MIL-P-25690, Type C, acrylic plastic, determined in accordance with ASTM F 484.

3.2.4.2 The cleaner shall not craze, stain, or discolor MIL-P-83310 polycarbonate plastic, determined in accordance with test procedures specified in ASTM F 484 on specimens stressed for 30 minutes ± 2 to an outer fiber stress of 3000 psi (20.7 MPa).

3.2.5 Effect on Painted Interior Surfaces: Cleaner, at use dilution, shall neither decrease the hardness of the paint film by more than two pencil hardness levels nor shall it produce streaking, discoloration, or other damage to the paint film, determined in accordance with ASTM F 502.

3.2.6 Effect on Carpeting:

3.2.6.1 Discoloration: Cleaner, at use dilution, shall neither cause discoloration or other adverse effects on carpeting nor shall it show a loss greater than 1 pound force (4.5 N), determined in accordance with 3.2.6.1.1.

3.2.6.1.1 Cut two adjacent pieces, approximately 6 x 12 inches (152 x 305 mm), from a section of test carpeting. One piece shall be used as a control sample; the other piece shall be sprayed uniformly with 25 to 50 mL of the cleaner at use dilution, allowed to dry for 24 hours ± 1, and examined for discoloration, swelling of the latex backing, and other deleterious effects by comparing it with the control sample. Using a 50 pounds force (225 N) Dial Push-Pull Gauge and procedures in accordance with ASTM D 1335, pull an individual loop of pile through the top of the carpeting and record the force required. Take four readings on the test sample and four on the control sample and average each set of readings. The difference in the average readings shall be less than 1 pound force (4.5 N).

3.2.6.2 Washability and Color Fastness: Standards for acceptance shall be established by purchaser, determined in accordance with AATCC Test Method 138.

3.2.6.3 Flame Retardancy: Ten washings of the carpet with the cleaner at use dilution shall not alter the burn rate characteristics of carpeting, determined in accordance with FAR 25.853.

3.2.6.4 Resoiling Resistance: Shall be equal to or better than standards for acceptance established by purchaser, determined in accordance with CSMA Bulletin 308 on carpeting cleaned with the product at use dilution.

3.2.7 Foam Height: Place 100 mL of a 2% solution of the cleaner in ASTM D 1193, Type IV, water at 38 °C ± 1 (100 °F ± 2) in a glass-stoppered 500 mL cylinder. Shake vigorously for 10 seconds ± 1. The foam height shall not extend beyond the 250 mL mark immediately upon placing the cylinder to rest nor shall it extend beyond the 150 mL mark after one minute.

3.2.8 Storage Stability: Cleaner, exposed to heat and cold in accordance with ASTM F 1104, shall show no precipitation, stratification, layering, or separation.

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 performing 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: Tests for total immersion corrosion (3.2.3.2), effect on plastics (3.2.4), and foam height (3.2.7) are acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: Tests for 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.

4.2.2.1 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, contracting officer, or request for procurement.

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 a single production run from the same batches of raw materials under the same fixed conditions 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 changes 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 on each lot to determine conformance to the acceptance test requirements and stating that the cleaner conforms to the other technical requirements. This report shall include the purchase order number, lot number, AMS 1631B, 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.