AEROSPACE MATERIAL SPECIFICATION

AMS1631™	REV. D

Issued 1978-01
Revised 2018-11
Reaffirmed 2024-01

Superseding AMS1631C

(R) Cleaner, Carpet Water Extraction Type

RATIONALE

Changes in this revision include format/editorial changes as well update to specification revisions. CSMA test specifications are no longer available requiring modification to the specification. Additional details are required in order for the Washability and Color Fastness testing to be performed.

AMS1631D has been reaffirmed to comply with the SAE Five-Year Review policy.

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 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/AMS1631D/

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS4037	Aluminum Alloy, Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate), Solution Heat Treated
AMS4041	Aluminum Alloy, Sheet and Plate, Alclad 4.4Cu - 1.5Mg - 0.60Mn (2024, -T3 Sheet/-T351 Plate with 1-1/2% Alclad) Solution Heat Treated, Cold Worked and Naturally Aged
AMS4045	Aluminum Alloy Sheet and Plate, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr 7075: (-T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated
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
AMS-P-83310	Plastic Sheet, Polycarbonate, Transparent
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications

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 D56	Standard Test Method for Flash Point by Tag Closed Tester
ASTM D1193	Reagent Water
ASTM D1335	Tuft Bind of Pile Floor Coverings
ASTM F483	Standard Practice for Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F484	Standard Test Method for Stress Crazing of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds
ASTM F502	Standard Test Method for Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces
ASTM F1104	Preparing Aircraft Cleaning Compounds, Liquid Type, Water Base, for Storage Stability Testing
ASTM F1110	Standard Test Method for Sandwich Corrosion Test

2.3 U.S. Government

Copies of these documents are available online at http://quicksearch.dla.mil.

MIL-PRF-25690	Plastic, Sheets, and Formed Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant

2.4 Federal Aviation Administration Regulations

Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 or www.faa.gov.

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 or www.aatcc.org.

AATCC Test Method 138 Cleaning: Washing of Textile Floor Coverings

2.6 Other Publications

ANSI Z400.1/Z129.1 Hazardous Workplace Chemicals - Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation

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 D1193, Type IV, water for dilution.

3.2.1 Solubility

Cleaner shall be readily miscible 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 D1193, 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, $Ca(C_2H_3O_2)_2 \cdot 2H_2O$	0.20 gram ± 0.005
AR Magnesium Sulfate, $MgSO_4 \cdot 7H_2O$	0.15 gram ± 0.005
AR Sodium Chloride, NaCl	0.12 gram ± 0.005
ASTM D1193, Type III, Water	To make 1 liter

3.2.1.1.2 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 D56.

3.2.3 Corrosion of Metal Surfaces

3.2.3.1 Sandwich Corrosion

Specimens of AMS4045 and AMS4049 aluminum alloy, after testing in accordance with ASTM F1110 on cleaner both in the concentrated form and at use dilution, shall not show corrosion worse than control panels tested with ASTM D1193, 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 F483 on panels of AMS4037, AMS4045, and either AMS4041 or AMS4049 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-PRF-25690, Type C, acrylic plastic, determined in accordance with ASTM F484.

3.2.4.2 The cleaner shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastic, determined in accordance with test procedures specified in ASTM F484 on specimens stressed for 10 minutes ± 1 minute to an outer fiber stress of 2000 psi (13.0 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 F502.

3.2.6 Effect on Carpeting

Manufacturer and specification details of the test carpet shall be determined by the purchaser, and if not determined by the purchaser, shall be specified by the supplier and the carpet specifications shall be included in the report.

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 minute, 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 D1335, 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

3.2.6.2.1.1 Two samples of test carpet shall be prepared according to AATCC Test Method 138. One test carpet sample shall have as the cleaning agent reagent water to ASTM D1193, Type IV and cleaned according to the steps outlined in AATCC Test Method 138. The other carpet sample shall have as the cleaning agent the test solution diluted to the at use dilution and the carpet is cleaned according to AATCC Test Method 138. The two samples are compared for color. Any color difference between the two carpet samples will be noted.

3.2.6.3 Flame Retardancy

Ten washings of the carpet with the cleaner at use dilution, cleaned according to the AATCC Test Method 138, shall not alter the burn rate characteristics of carpeting, determined in accordance with FAR 25.853.

3.2.7 Foam Height

Place 100 mL of a 2% solution of the cleaner in ASTM D1193, Type IV, water at 38 °C ± 1 °C (100 °F ± 2 °F) in a glass-stoppered 500 mL cylinder. Shake vigorously for 10 seconds ± 1 second. 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 F1104, 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 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 specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Total immersion corrosion (3.2.3.2), effect on plastics (3.2.4), foam height (3.2.7), and quality (3.3) 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.

4.3 Sampling and Testing

Sufficient product shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three; 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.