

**Cleaner, Carpet
Shampoo Type**

1. SCOPE:

1.1 Form:

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

1.2 Application:

This cleaner has been used typically with shampooing 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 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 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 - 0.60 Mn (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
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 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 Cracking 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 or www.dsp.dla.mil.

MIL-PRF-25690	Plastic Sheets and Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant
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2.4 Federal Aviation Administration Regulations:

Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. This can also be viewed online at www.faa.gov.

FAR Part 25	Airworthiness Standards; Transport Category Airplanes
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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, 1913 Eye Street NW, Washington, DC 20006.

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, reagent water for dilution.

3.2.1 Solubility: Cleaner shall be readily miscible with 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, $\text{Ca}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$	0.20 grams $\pm$ 0.005
AR Magnesium Sulfate, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$	0.15 grams $\pm$ 0.005
AR Sodium Chloride, NaCl	0.12 grams $\pm$ 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 and 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 produce evidence of staining, pitting, or discoloration of the panels nor cause a weight change of any panel greater than 0.3 mg/cm² 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-PRF-25690, Type C, acrylic plastic, determined in accordance with ASTM F 484.
- 3.2.4.2 The cleaner shall not craze, stain, or discolor AMS-P-83310 polycarbonate plastics, determined in accordance with test procedures specified in ASTM F 484 on specimens stressed for 10 minutes $\pm$ 1 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 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 force loss of more 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 304 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 $\pm$ 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 pounds 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 one pound force (4.5 N).

- 3.2.6.2 Washability and Color Fastness: Standards for acceptance shall be as 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 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 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 the requirements of this specification.

4.2 Classification of Tests:

- 4.2.1 Acceptance Tests: Total immersion corrosion (3.2.3.2), effect on plastics (3.2.4), and effect on carpeting (3.2.6) are acceptance tests and shall be performed on each lot.
- 4.2.2 Preproduction Tests: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of the 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 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.