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400 COMMONWEALTH DRIVE WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 1500A
Superseding AMS 1500

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LIQUID HAND SOAP
Coconut-Oil Base

1. SCOPE:

1.1 Form: This specification covers a coconut-oil base hand soap in the form of a liquid.

1.2 Application: Primarily for use in aircraft lavatories but suitable for general use where dermatological factors are of prime consideration and freedom from objectionable odors is necessary.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) and Aerospace Recommended Practices (ARP) shall apply. The applicable issue of other documents shall be as specified in AMS 2350 except that the latest issue of Federal Food and Drug Administration publications in effect on date of invitation to bid or request for proposal shall apply.

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 4049 - Aluminum Alloy Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075; -T6 Sheet, -T651 Plate)

2.1.2 Aerospace Recommended Practices:

ARP 1512 - Corrosion of Aluminum Alloys by Aircraft Maintenance Chemicals, Sandwich Test

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

ASTM D56 - Flash Point by Tag Closed Tester
ASTM D445 - Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM D460 - Sampling and Chemical Analysis of Soaps and Soap Products
ASTM D891 - Specific Gravity of Industrial Aromatic Hydrocarbons and Related Materials
ASTM E70 - pH of Aqueous Solutions with the Glass Electrode
ASTM F483 - Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F502 - Determination of Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces
ASTM F503 - Preparing Aircraft Cleaning Compounds, Liquid Type, for Storage Stability Testing

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120 except as specified in 2.3.3.

2.3.1 Military Specifications:

MIL-S-5059 - Steel, Corrosion Resistant (18-8), Plate, Sheet, and Strip
MIL-C-83286 - Coating, Urethane, Aliphatic Isocyanate, for Aerospace Applications

2.3.2 Military Standards:

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

2.3.3 Federal Food and Drug Administration Publications: Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Federal Food, Drug, and Cosmetic Act, and Regulations Promulgated Thereunder

3. TECHNICAL REQUIREMENTS:

3.1 Composition: The ingredients used in the manufacture of the product shall conform to the standards set forth in the Federal Food, Drug, and Cosmetics Act. The product shall be a uniform aqueous solution, with 100% coconut-oil base, conforming to the following requirements, determined in accordance with ASTM D460:

Moisture (Method B, Distillation Method), max	83.0%
Total Anhydrous Soap (Coconut-oil base only), min	15.0%
Glycerine, USP Grade	1.0 - 1.5%
Total Unsaponified and Unsaponifiable Matter, max	0.6%
Total Matter Insoluble in Alcohol, max	0.5%
Chlorides, max	0.1%
Combined Sodium and Potassium Oxides, max	0.25%
Total Alkalinity of Matter Insoluble in Alcohol, Alkaline Salts, max	0.2%
Matter Insoluble in Water, max	0.1%
Free Acid, max	0.1%
Sulfates, max	0.1%
Free Alkali, max	0.05%
Corrosion Inhibitors (Shall be identified on AMS 2825 data sheet as in 4.5.1), max	0.5%
Rosin Acids	None
Sugar	None

3.2 Properties: The product 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 applicable, at use dilution recommended by the manufacturer:

3.2.1 Color: Shall be lemon yellow, unless otherwise specified.

3.2.2 Flash Point: The product shall exhibit no flash point, determined in accordance with ASTM D56.

3.2.3 Viscosity: Shall be determined at 25°C ± 1 (77°F ± 2) in accordance with ASTM D445 and the results reported.

3.2.4 Specific Gravity: Shall be determined in accordance with ASTM D891 and the results reported.

3.2.5 pH Value: Shall be 7.0 - 8.6, determined in accordance with ASTM E70.

3.2.6 Effect on Metallic Surfaces: Shall be as follows, determined on the product both as a concentrate and at use dilution:

3.2.6.1 Sandwich Corrosion: Specimens, after test, shall show a rating not worse than 1, determined in accordance with ARP 1512.

3.2.6.2 Total Immersion Corrosion: The product shall neither show evidence of corrosion of the panels nor cause a weight change greater than 0.3 mg/cm^2 per 24 hr for any single panel of AMS 4049 aluminum alloy, determined in accordance with ASTM F483. Other panels for test shall include chromium-plated steel and MIL-S-5059 corrosion-resistant steel. Discoloration or corrosion of these other panels shall not exceed that of a control panel.

3.2.7 Effect on Painted Surfaces: The product shall neither produce a decrease Ø in film hardness greater than one pencil hardness level nor shall it produce any staining, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

3.2.8 Temperature Stability: The product shall show no chemical or physical deterioration, including evidence of discoloration, layering, or other change denoting loss of stability, after being exposed for 120 hr ± 1 to 2°C ± 3 (35°F ± 5) and to 40°C ± 5 (120°F ± 10).

3.2.9 Storage Stability: The product shall be stable in storage for not less than 12 months at room temperature. Product shall remain free of lumps and skin formation and shall remain homogeneous. Samples prepared as in 3.2.9.1 shall show no evidence of layering, separation, settling, or crystallization after being subjected to five freeze-thaw cycles as in 3.2.9.2. The product shall also be tested in accordance with ASTM F503 and the results reported.

3.2.9.1 Two 6-oz (175-mL) samples of the product shall be placed in two 8-oz (235-mL) clear glass bottles, sealed, and, from that time until test is completed, shall be handled so as to minimize movement of the sample.

3.2.9.2 Samples shall be exposed for not less than 12 hr at -25°C (-10°F) or lower as necessary to completely freeze the sample. At the end of the 12 hr, samples shall be removed to a room-temperature environment and allowed to thaw completely.

3.3 Quality: The product, as received by purchaser, shall be clear and free from suspended matter and sediment, shall show no separation, shall be ready for use, and shall form a satisfactory lather. Product shall not leave any objectionable odor on skin or other surfaces after washing with the product and rinsing thoroughly with plain tap water.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all Ø 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 product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for flash point (3.2.2), viscosity (3.2.3), specific gravity (3.2.4), pH (3.2.5), and quality are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for effect on metallic surfaces (3.2.6), effect on painted surfaces (3.2.7), temperature stability (3.2.9), and storage stability (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 the soap to a purchaser, when a change in material or processing, or both, 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, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be in accordance with all requirements of ASTM D460 applicable to liquid soap, unless otherwise specified by purchaser.

4.4 Approval:

4.4.1 Sample soap shall be approved by purchaser before soap for production use is supplied, unless such approval be waived by purchaser. Results of tests on production soap 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 soap which are essentially the same as those used on the approved sample soap. If necessary to make any change in ingredients or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material or processing, or both, and, when requested, sample soap. Production soap made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports: Unless waived by purchaser, the vendor of soap shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, AMS 1500A, manufacturer's identification, lot number, and quantity.