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400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 1725

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Revised

SKIN PROTECTIVE COMPOUND
Chemical Barrier

1. SCOPE:

1.1 Form: This specification covers three types of semi-solid skin protective compounds in the form of barrier creams.

1.2 Application: Primarily for the protection of skin from exposure to aircraft maintenance chemicals.

1.3 Classification: The three types of protective compounds are classified as follows:

Type I - Stain, adhesion, and abrasion
Type II - Solvent resistant
Type III - Water-miscible chemicals (acid and alkali) resistant

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 CTFA publications in effect on date of invitation to bid or request for proposal shall apply.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 4049 - Aluminum Alloy Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.26Cr (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 E70 - pH of Aqueous Solutions with the Glass Electrode
ASTM F483 - Total Immersion Corrosion Test for Aircraft Maintenance Chemicals
ASTM F484 - Stress Crazing of Acrylic Plastics in Contact with Liquid or Semi-Liquid Compounds
ASTM F502 - Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces

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

2.3.1 Federal Specifications:

O-T-236 - Tetrachloroethylene (Perchloroethylene); Technical Grade
VV-C-846 - Cutting Fluids: Emulsifiable Oil

2.3.2 Military Specifications:

MIL-C-15203 - Coating Compound, Bituminous Emulsion
MIL-P-25690 - Plastic, Sheets and Parts, Modified Acrylic Base, Monolithic, Crack Propagation Resistant

2.3.3 Military Standards:

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

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

Federal Hazardous Substances, Labeling Act

2.4 CTFA Publications: Available from Cosmetic, Toiletry, and Fragrance Association, Inc., 1625 Eye Street Northwest, Washington, DC 20006.

A Guideline for the Determination of Adequacy of Preservation of Cosmetics and Toiletry Formulations

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall be optional with the manufacturer, shall conform to standards set forth in the Federal Food, Drug, and Cosmetic Act for skin protective compounds, and shall meet the requirements of 3.2.

3.2 Properties: The product shall conform to the following requirements:

3.2.1 Consistency: Shall be such that the product in the range 5° - 40°C (40° - 100°F) can be applied to the skin to form a flexible, adhering film which shall be neither sticky nor greasy, determined in accordance with 4.5.1.

3.2.2 Removability: The compound shall be removable from the skin with soap and warm water, determined in accordance with 4.5.2.

3.2.3 Odor: The compound shall not present any objectionable odor during and after application to the skin, determined in accordance with 4.5.3.

3.2.4 pH: Shall be within the range 6.0 - 8.5, determined in accordance with ASTM E70.

3.2.5 Viscosity: Shall be not less than 200,000 cps (200 Pa·s) determined in accordance with 4.5.4.

3.2.6 Stability: The compound shall remain homogeneous without evidence of separation under normal storage conditions from 18° to +52°C (0° to 125°F), determined in accordance with 4.5.5.

3.2.7 Barrier Protection: The compound shall evince no complete penetration, within 30 min. after application, to the applicable challenging agents, determined in accordance with 4.5.6.

3.2.8 Toxicity:

3.2.8.1 Acute Oral Toxicity: Shall be not less than 16 mL/kg as evaluated on rats, determined in accordance with Federal Hazardous Substances Act, 16CFR, 1500.3.

3.2.8.2 Eye Irritation: The compound shall not be an ocular irritant as evaluated on rabbits, determined in accordance with Federal Hazardous Substances Act, 16CFR, 1500.41.

3.2.8.3 Skin Irritation: The compound shall not be a primary irritant as evaluated on rabbits, determined in accordance with Federal Hazardous Substances Act, 16CFR, 1500.42.

3.2.9 Adequacy of Preservative System: The compound shall contain not more than 10 microorganisms per gram of compound, determined in accordance with a guideline for the determination of preservation of cosmetic and toiletry formulations (See 2.4).

3.2.10 Corrosion of Metal Surfaces:

3.2.10.1 Sandwich Corrosion: Specimens of AMS 4049 alclad aluminum alloy, after test, shall show a rating not worse than 1, determined in accordance with ARP 1512.

3.2.10.2 Total Immersion Corrosion: The compound shall neither show evidence of corrosion of the panels nor cause a weight change greater than 0.3 (mg/cm^2)/24 hr for any single panel of AMS 4049 alclad aluminum alloy, determined in accordance with ASTM F483.

3.2.11 Effect on Painted Surfaces: The compound shall neither produce a decrease in film hardness greater than two pencil hardness levels nor shall it produce any streaking, discoloration, or blistering of the paint film, determined in accordance with ASTM F502.

3.2.12 Effect on Plastics: The compound shall not craze, stain, or discolor MIL-P-25690 acrylic plastic, determined in accordance with ASTM F484. The compound, likewise shall not craze, stain, or discolor poly carbonate or polysulfone plastics, determined in accordance with test procedures specified in ASTM F484 on specimens stressed for 72 hr ± 1 to an outer fiber stress of 3000 psi (21 MPa).

3.3 Quality: The compound, as received by purchaser, shall be homogeneous, soft in texture, and free from grit or abrasive particles and from foreign materials detrimental to usage of the compound.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the compound shall supply all 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 4.6. Purchaser reserves the right to sample and to perform such confirmatory testing as he deems necessary to ensure that the compound conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for consistency (3.2.1), removability (3.2.2), odor (3.2.3), pH (3.2.4), and quality (3.3) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for viscosity (3.2.5), stability (3.2.6), barrier protection (3.2.7), and toxicity (3.2.8) are classified as periodic tests and shall be performed at a frequency selected by the manufacturer unless frequency of testing is specified by purchaser.

4.2.3 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classifed as qualification tests and shall be performed on the initial shipment of the compound to a purchaser, when a change in material or processing 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, qualification test material shall be submitted to the cognizant qualification agency as directed by the procuring activity, the contracting officer, or the request for procurement.

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

4.3.1 A lot shall be all compound produced in a single production run from the same batches of raw materials under the same fixed conditions, or shall be all compound subjected to the same unit chemical or physical process intended to make the compound homogeneous, and presented for manufacturer's inspection at one time.

4.4 Approval:

4.4.1 Sample compound shall be approved by purchaser before compound for production use is supplied, unless such approval be waived. Results of tests on production compound shall be essentially equivalent to those on the approved sample compound.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production compound which are essentially the same as those used on the approved sample compound. If any change is necessary in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material and processing and, when requested, sample compound. Production compound made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Consistency:

4.5.1.1 Cold Application: Cool compound in a closed container to 5°C ± 1 (40°F ± 2) for 5 hr ± 0.25. Apply compound to freshly washed and dried fingers, hands, and forearms. Cover skin with a thin even film of compound. Let film dry. Note ease of application, smoothness, and continuity of film on skin. After 5 min., flex fingers for approximately 1 min. and examine skin to determine that film has not cracked off and is not sticky or greasy.

4.5.1.2 Warm Application: Warm compound in a closed container to 40°C ± 1 (100°F ± 2) for 5 hr ± 0.25. Apply warmed compound to fingers, hands, and forearms and evaluate characteristics of the compound as in 4.5.1.1.

4.5.2 Removability: After testing compound as in 4.5.1, wash hands and arms with soap and warm water. Compound shall be removable without the need for the abrasive action of a cloth or brush.

4.5.3 Odor: Note odor of product in freshly opened container, during application to the skin as in 4.5.1, and 5 min. after compound has been applied.

4.5.4 Viscosity: Condition sample for not less than 60 min. at 25°C ± 1 (77°F ± 2). Determine viscosity with a Brookfield Viscometer, Model LVT, and the Helipathstand using T Bar F spindle at 1.5 rpm or other suitable equipment approved by purchaser.

4.5.5 Stability:

4.5.5.1 Low Temperature: Cool two unopened containers of compound to -18°C ± 3 (0°F ± 5) for 24 hr ± 0.5, remove the containers from the freezer, and allow the containers to stabilize at room temperature. Repeat this cooling and warming cycle for a second time. Open one container and examine contents for separation and homogeneity. Reserve the unopened container for elevated temperature test of 4.5.5.2.

4.5.5.2 Elevated Temperature: Place unopened container from low-temperature test (4.5.5.1) in an oven maintained at 52°C ± 3 (125°F ± 5). After 7 days, remove containers from oven and allow to cool to room temperature. Open container and examine contents for separation, homogeneity, and unpleasant odor.

4.5.6 Barrier Protection: Completely impregnate the center portion of a confined spot test paper (See 8.1) with the proper indicating solution, if required, and allow to dry before use in the test assembly. Load the compound into a calibrated glass syringe, taking care to avoid introduction of air bubbles. Discharge 0.1 mL of the compound onto the center of the test paper. Place an open sheet of brass shim stock, nominally 0.005 in. (0.13 mm) thick, on top of the test paper and around the compound. On top of this brass shim, place another piece of confined spot test paper with the confined area being carefully centered on the confined area of the bottom sheet (See Fig. 1). Subject the assembly to 5,000 lb (22,240 N) pressure (See 8.2) so that the maximum thickness of the compound film becomes that of the shim metal standard. Carefully transfer the compound sandwich assembly to a glass plate and place in an oven maintained at 38°C ± 3 (100°F ± 5) for 10 min. ± 0.5. Carefully transfer the sandwich assembly to a viewing box (See Fig. 2) and place approximately 0.1 mL of the proper challenging agent on top of the assembly (See Fig. 1). The volume of the challenging agent used shall be in excess of that absorbed by the test paper. By means of a mirror, illuminate the bottom of the test assembly with a fluorescent light. Penetration (or end point) is the complete change in color of the confined spot of the bottom test paper. Complete penetration of the specific challenging agent before 30 min. after application indicates failure of the compound to meet this requirement. Partial penetration, as evinced by "spotting" of the test paper, should be distinguished from complete penetration.

Product Type	Challenging Agent	Indicating Solution	Color
I	MIL-C-15203 Coating Compound	None	Black or Brown
II	O-T-236 Tetrachloroethylene	Sudan Red	Red
II	VV-C-846 Cutting Fluids	Sudan Red	Red
III	0.25N C.P. Hydrochloric Acid	Bromophenol Blue	Yellow
III	0.25N C.P. Sodium Hydroxide	Phenolphthalein	Red

4.6 Reports: The vendor of the compound 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 compound conforms to the other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 1725, manufacturer's compound number, and quantity.

4.7 Resampling and Retesting: If any sample used in the above tests fails to meet the specified requirements, disposition of the compound may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the compound represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 The compound shall be packaged in suitable containers of a size and type agreed upon by purchaser and vendor.

5.1.2 Each container shall be legibly marked in accordance with the latest regulations for cosmetics and shall show not less than AMS 1725, purchase order number, lot number, manufacturer's identification, and quantity.

5.1.3 Containers of compound shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the compound to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

5.1.4 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-794, Level A or Level C, as specified in the request for procurement. Commercial packaging as in 5.1.1 and 5.1.3 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.

7. REJECTIONS: Compound not conforming to this specification or to modifications authorized by purchaser will be subject to rejection.

8. NOTES:

8.1 Yagoda Confined Test Paper, No. 211-Y, a product of Schleicher and Schuell, Inc., has produced satisfactory results for barrier protection test (4.5.7).

8.2 Satisfactory results have been obtained by utilizing a Carver laboratory press.

8.3 For direct U.S. Military procurement, purchase documents should specify not less than the following:

Title, number, and date of this specification
Type of compound desired (See 1.3)
Type and size of containers desired
Quantity of compound desired
Applicable level of packaging (See 5.1.4).