AEROSPACE MATERIAL SPECIFICATION

AMS1650™	REV. D

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Superseding AMS1650C

Polishing Compound, Aircraft Metal

RATIONALE

This revision added definitions of “polish” and “clarity.” Polish was updated to polishing compound throughout the document and was updated to current template.

1. SCOPE

1.1 Form

This specification covers a polishing compound for aircraft metals in the form of a liquid or paste.

1.2 Application

This product has been used typically for polishing unpainted aluminum alloy surfaces of aircraft, but usage is not limited to such applications. This polishing compound is not intended for polishing plastic or painted surfaces but can come into contact with them without deterioration.

1.3 Classification

The polishing compound covered by this specification is classified as follows:

Type 1 – Liquid
Type 2 – Paste

1.3.1 Unless a specific type is ordered, either Type 1 or Type 2 may be supplied.

1.3.2 Clarity

The quality of the reflection off a polished surface. Also known as “Resolution” and “Clean Lines.” A reflection on a high clarity polish is free from distortion.

1.3.3 Polish

Verb: To physically transform a surface by rubbing it with successively finer abrasives until it becomes reflective.

Adjective: The degree of reflectivity and clarity of a polished surface. A surface is “polished” if it is mirror-like, clear, and without defects visible by unaided eyes from 1 foot or more.

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1.3.4 Polishing Compound

A consumable used to polish a surface. Polishing compounds are liquids or pastes composed of abrasives and chemicals effective for a given polishing method and substrate.

1.3.5 Reflectivity

The degree to which a polished surface reflects light. Also known as *shininess* and *gloss*. A lightly polished surface is dull, a moderately polished surface is blurry and a highly polished surface is mirror-like, shiny or glossy.

1.4 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 form 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.

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.

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

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 Flash Point by Tag Closed Tester

ASTM D562 Consistency of Paints Using the Stormer Viscometer

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 F485 Effects of Cleaners on Unpainted Aircraft Surfaces

ASTM F502 Effects of Cleaning and Chemical Maintenance Materials on Painted Aircraft Surfaces

ASTM F1110 Sandwich Corrosion Test

2.3 U.S. Government Publications

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

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

3. TECHNICAL REQUIREMENTS

3.1 Material

3.1.1 Toxicity

The polishing compound shall not be hazardous as defined by OSHA regulations.

3.2 Properties

The polishing compound shall conform to the following requirements; tests shall be performed in accordance with specified test methods on the product supplied:

3.2.1 Flash Point

Shall be not lower than 60 °C (140 °F), determined in accordance with ASTM D56.

3.2.2 Viscosity (Type 1 Only)

Shall be 50 to 70 Krebs units, determined in accordance with ASTM D562 at 24 °C ± 3 °C (75 °F ± 5 °F).

3.2.3 Corrosion of Metal Surfaces

3.2.3.1 Sandwich Corrosion

Polishing compound shall produce a rating not worse than 1, determined in accordance with ASTM F1110.

3.2.3.2 Total Immersion Corrosion

Polishing compound shall not cause a weight change greater than 0.3 mg/cm^2 per 24 hours for any panel of AMS4045 and AMS4049 aluminum alloy, determined in accordance with ASTM F483. The product shall cause no evidence of etching, selective attack, or presence of corrosion products after any time period and only a slight dulling at the end of the test.

3.2.4 Effect on Plastic

Polishing compound shall not craze, stain, or discolor stretched MIL-P-25690 plastic, determined in accordance with ASTM F484.

3.2.5 Effect on Painted Surfaces

Polishing compound shall neither decrease the hardness of the paint film by more than two pencil hardness levels nor shall it produce any staining or blistering of the paint film, determined in accordance with ASTM F502.

3.2.6 Effect on Unpainted Surfaces

Polishing compound, tested in accordance with ASTM F485, shall neither produce streaking nor leave any stains on AMS4045 and AMS4049 aluminum alloys which require polishing to remove.

3.2.7 Settling Number (Type 1 Only)

Shall be not greater than 20, determined as in 3.2.7.1.

3.2.7.1 Place 50 mL of well-mixed Type 1 polishing compound in a 1 x 6 inch (25 x 152 mm) test tube. Cap the tube and allow the tube to remain undisturbed in an upright position for not less than 24 hours. After the settling period, invert the test tube repeatedly until the solid matter is dislodged and begins to disperse evenly. Record the number of inversions as the settling number.

3.2.8 Low-Temperature Stability

The polishing compound shall be restorable to its original appearance by vigorous shaking or by stirring after being temperature cycled as in 3.2.8.1.

3.2.8.1 Place approximately 100 mL of Type 1 polishing compound or 100 grams of Type 2 polishing compound in each of two 125 mL wide-mouth Pyrex jars and stopper the jars. Set aside one of the jars at 20 to 25 °C (68 to 77 °F) for the duration of the test period as a control sample. Place the second jar containing the test sample in a cold box maintained at -10 °C ± 2 °C (14 °F ± 4 °F) for 2 hours ± 0.1 hour. At the end of the 2 hour period, remove the jar containing the test sample and immerse in a water bath maintained at 47 °C ± 1 °C (117 °F ± 2 °F) for 1 hour ± 0.1 hour. Remove the jar from the water bath, dry, and again place in the cold box at -10 °C ± 2 °C (14 °F ± 4 °F) for 2 hours ± 0.1 hour. At the end of the second 2-hour period, remove the jar from the cold box and immerse in the water bath maintained at 47 °C ± 1 °C (117 °F ± 2 °F) for 1 hour ± 0.1 hour. Remove the jar from the water bath, dry, and again place the jar in the cold box at -10 °C ± 2 °C (14 °F ± 4 °F) for a third 2-hour period. At the end of this period, remove the jar from the cold box and allow the jar to remain at room temperature for 16 hours ± 0.5 hour. For Type 1 polishing compound, shake the jar containing the test sample vigorously by hand; for Type 2, stir the contents of the jar. Compare the appearance of the test sample with the control sample.

3.2.9 Abrasive Number

Shall not exceed 5, determined as in 3.2.9.1.

3.2.9.1 Weigh two 0.04 x 3 x 6 inch (1 x 76 x 152 mm) AMS4049 aluminum alloy panels after washing the panels thoroughly with a non-abrasive detergent, thoroughly rinsing with deionized water, and drying. Cover one of the panels with a thin coating of the polishing compound. Place the second panel on the coated panel and rotate 25 times in moderate circular motion. Separate the panels and wipe clean with a soft cloth saturated with acetone. Reweigh and determine the weight loss. Report the weight loss in milligrams as the abrasive number and examine the surfaces of the panels for any evidence of scratching.

3.2.10 Performance

The polishing compound, when used in accordance with manufacturer's recommendations, shall restore the reflectivity of unpainted aluminum surfaces of aircraft.

3.3 Quality

The polishing compound, as received by purchaser, shall be uniform in texture, homogeneous, and free from foreign materials detrimental to usage of the polishing compound.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the polishing compound 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 polishing compound conforms to the requirements of this specification.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Abrasive number (3.2.9) 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 polishing compound 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.