SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS-C-27725C

Issued 1999-10
Revised 2008-02

Superseding AMS-C-27725B

Coating, Corrosion Preventative, for Aircraft Integral Fuel Tanks for Use to 250 °F (121 °C)

RATIONALE

To correct paragraph numbering errors in the B revision.

1. SCOPE

1.1 Form

This specification covers three types of corrosion preventative coatings for protection of aircraft integral fuel tanks.

1.2 Application

The coating materials covered by this specification are typically applied to the interior of aircraft integral fuel tanks to protect against corrosion from fuel contaminants, but usage is not limited to such applications. They are suitable for use in a service temperature range from -65 to +250 °F (-54 to +121 °C).

1.3 Classification

The corrosion-preventative coatings covered by this specification shall be of the following types.

Type 1 - A two-component polyurethane coating with less than 420 g/l Volatile Organic Compound (V.O.C.) content.
Type 2 - A two-component polyurethane coating with less than 720 g/l V.O.C. content.
Type 3 - Non-chromated coating with less than 420 g/l V.O.C. content

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.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

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.

2.1 SAE Publications

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

AMS 2471	Anodic Treatment of Aluminum Alloys, Sulfuric Acid Process, Undyed Coating
AMS 2473	Chemical Film Treatment for Aluminum Alloys General Purpose Coating
AMS 2629	Fluid, Jet Reference
AMS 2825	Material Safety Data Sheets
AMS 3276	Sealing Compound, Integral Fuel Tanks and General Purpose, Intermittent Use to 360 °F (182 °C)
AMS 3819	Cloths, Cleaning, for Aircraft Primary and Secondary Structural Surfaces
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
AS5505	Requirements for Accreditation of Testing Laboratories for Organic Coatings
AS9100	Quality Systems - Aerospace - Requirements
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications

2.2 PRI Publications

Available from Performance Review Institute, 161 Thorn Hill Road, Warrendale, PA 15086-7527, Tel: 724-772-1616, www.pri-network.org.

PRI QPL-AMS-C-27725	Products Qualified Under AMS-C-27725
PD 2000	Procedures for an Industry Qualified Product Management Process

2.3 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 B 36	Brass Plate, Sheet, Strip and Rolled Bar
ASTM D 257	DC Resistance or Conductance of Insulating Materials
ASTM D 740	Standard Specification for Methyl Ethyl Ketone
ASTM D 1200	Viscosity by Ford Viscosity Cup
ASTM D 1353	Nonvolatile Material in Volatile Solvents for Use in Paint, Varnish, Lacquer and Related Products
ASTM D 1475	Density of Liquid Coatings, Inks, and Related Products
ASTM D 1974	Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
ASTM D 3960	Volatile Organic Compound (VOC) Content of Paint and Related Coatings
ASTM D 3335	Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
ASTM D 3363	Standard Test Method for Film Hardness by Pencil Test

2.4 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, http://assist.daps.dla.mil/quicksearch/.

PPP-C-96	Can, Metal, 28 Gage and Lighter
FED-STD-791	Lubricants, Liquid Fuels, and Related Products, Methods of Testing
MIL-PRF-23699	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code 0-156
MIL-PRF-83282	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft
MIL-DTL-85470	Inhibitor, Icing, Fuel System, High Flash NATO Cold Number S-1745
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-DTL-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys

2.5 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036, Tel: 212-642-4900, www.ansi.org.

ISO/IEC 17025	General Requirements for the Competence of Testing and Calibration Laboratories

3. TECHNICAL REQUIREMENTS

3.1 Materials

The basic ingredient shall be polyurethane for Types 1 and 2 with curing agents, thinners, and additives suitable for various application methods including brushing, dipping, and spraying. Type 3 shall not contain any chromium or chromium compounds. Incidental chromium content in Type 3 coatings shall not exceed 5 ppm. The basic ingredients for the Type 3 coatings are not specified, providing the material will meet the performance requirements set forth in this specification and is suitable for various application methods including brushing, dipping, and spraying. All three types of coatings, when tested in accordance with ASTM D 3335, shall not contain any cadmium or cadmium compounds and shall not contain more than 0.06 percent of lead.

3.2 Properties

The coating, when prepared in accordance with the manufacturer's instructions shall conform to the requirements shown in Table 1, determined in accordance with specified test methods in Table 1.

TABLE 1 - APPLICATION PROPERTIES

Paragraph	Property	Requirement Type 1	Requirement Type 2	Requirement Type 3	Test Method
3.2.1	Surface appearance	Smooth, uniform, and free of film porosity and irregularities	Smooth, uniform, and free of film porosity and irregularities	Smooth, uniform, and free of film porosity and irregularities	4.6.5.1
3.2.2	Density, variation from acceptable qualification sample listed on QPL, percent	±5	±5	±5	4.6.5.2
3.2.3	Volatile Organic Compound Content (VOC) g/l, max	420	720	420	4.6.5.3
3.2.4	Viscosity, seconds				
	Initial	13 to 23	10 to 20	13 to 23	4.6.5.4
	After Application Life	≤35	≤20	≤35	4.6.5.4
3.2.5	Application life, hours, min	4	4	4	4.6.5.5
3.2.6	Drying time, hours max at standard conditions	2	2	2	4.6.5.6

3.2.7 Coating shall be fully cured within 21 days at standard conditions for Types 1 and 3, and within 14 days at standard conditions for Type 2. Types 1, 2, and 3 shall also be fully cured within 24 hours at standard conditions followed by 24 hours at 140 °F ± 2 (60 °C ± 1) and 50 percent ± 5 relative humidity when tested in accordance with 4.6.5.7. The cured coating shall have a minimum pencil hardness of “F” when tested in accordance with 4.6.5.22.

3.2.8 Resistance to Water

The cured coatings shall show no blistering, softening in excess of 1 hardness unit, leaching, corrosion extending more than 1/8 inch (3.2 mm) beyond the scribe mark or in from the edge of the panel, loss of adhesion, or other visible deleterious effect when tested as specified in 4.6.5.8.

3.2.9 Resistance to Salt Water and Fuel

The cured coatings shall show no blistering, softening in excess of 1 hardness unit, leaching, shrinkage, corrosion extending more than 1/8 inch (3.12 mm) beyond the scribe mark or in from the edge of the panel, loss of adhesion, or other visible deleterious effect when tested as specified in 4.6.5.9.

3.2.10 Resistance to Engine Oil

The cured coatings shall show no blistering, softening in excess of 1 hardness unit, leaching, shrinkage, loss of adhesion, or other visible deleterious effect when tested as specified in 4.6.5.10.

3.2.11 Resistance to Hydraulic Fluid

The cured coatings shall show no blistering, softening in excess of 1 hardness unit, leaching, shrinkage, loss of adhesion, or other visible deleterious effect when tested as specified in 4.6.5.11.

3.2.12 Fuel Contamination

The nonvolatile extractable materials contributed by the cured coatings in contact with the jet reference fluid shall not be more than 20 mg per 100 ml when tested as specified in 4.6.5.12. Not more than a slight discoloration or tarnish shall be present on a freshly polished copper strip.

3.2.13 Low-Temperature Flexibility

The cured coatings shall withstand the low-temperature test specified in 4.6.5.13 without cracking, checking, crazing, or loss of adhesion.

3.2.14 Peel Strength, Sealing Compound to Coating Material

Sealing compound conforming to AMS 3276, Class B-2, applied to the cured coating material shall have a peel strength of not less than 20 pounds force per inch (3503 N/m) when tested as specified in 4.6.5.14. There shall be no adhesive failure between the coating and the sealing compound except for bubbles and knife cuts.

3.2.15 Adhesion, Coating Material to Sealing Compound

The coating material applied to sealing compound conforming to AMS 3276, Class B-2, shall not cause cracks in the sealing compound when tested as specified in 4.6.5.15. Cracks in the cured coating shall be permissible, but the cured coating shall not flake from the sealant.

3.2.16 Repairability

The cured coating shall show no blistering or loss of adhesion when tested as specified in 4.6.5.16.

3.2.17 Accelerated Storage Stability

After storing as specified in 4.6.5.17, coating material shall be capable of meeting the initial viscosity requirements and the requirements for dry time and application life specified in Table 1.

3.2.18 Resistance to Iron Chloride

The cured coatings shall show no blistering or softening, and the panels shall show no corrosion when tested as specified in 4.6.5.18.1. After immersion, the cured coatings shall have a resistance of at least 5.0 megohms per mil of thickness when tested as specified in 4.6.5.18.2.

3.2.19 Resistance to Simulated Microbial By-Products

The cured coatings shall show no blistering, softening, or shrinkage when tested as specified in 4.6.5.19. There shall be not more than 5 percent loss of coating when subjected to the tape test. Removal of coating immediately adjacent to the scribe and obviously caused by coating cracking during scribing shall not be cause for rejection.

3.3 Quality

The coatings, as received by purchaser, shall be uniform in quality and condition, as free from foreign materials as commercially practicable and free from imperfections detrimental to the usage of the compound. There shall be no separation of ingredients that cannot be readily dispersed by hand mixing.

4. QUALITY ASSURANCE PROVISIONS

4.1 Quality System of Manufacturer

Before submitting a product for qualification to this specification for the purpose of being listed on the PRI QPL, the manufacturer must have a quality system in place which holds a third party accreditation to AS9100.

4.2 Responsibility for Inspection

The manufacturer of the product shall supply all samples needed for required 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 product conforms to specified requirements.

4.3 Classification of Tests

4.3.1 Acceptance Tests

Surface appearance (3.2.1), density (3.2.2), volatile content (3.2.3), viscosity (3.2.4), application life (3.2.5), drying time (3.2.6), and force cure time (3.2.7) are acceptance tests and shall be performed on each batch.

4.3.2 Qualification Tests

All technical requirements are qualification tests and shall be performed prior to the initial shipment of coating to a purchaser, when a change in ingredients and/or processing requires re-approval as in 4.5.4, and when purchaser deems confirmatory testing to be required. All qualification testing is to be carried out by a laboratory which is independent of the manufacturer and is accredited per ISO 17025 and AS5505.

4.4 Sampling and Testing

Shall be as follows:

4.4.1 For Acceptance Tests

Sufficient coating compound shall be taken at random from each batch to perform all the required tests. A batch shall be the quantity of material run through a mill or mixer at one time. The number of determinations for each required test shall be as specified in the applicable test procedure or, if not specified herein, not less than three, except that multiple testing is not required for viscosity, application life, drying time, and forced cure time.

4.4.1.1 A statistical sampling plan, acceptable to purchaser, may be used in lieu of sampling as in 4.4.1.

4.4.2 For Qualification Tests

Samples shall consist of approximately 2 gallons (7.6 L) of material. The material shall be furnished in containers of the type to be used in filling contract orders. Samples shall be identified as follows and forwarded to the activity responsible for testing, as designated in the letter of authorization from the activity responsible for qualification:

COATING, CORROSION PREVENTATIVE
For Aircraft Integral Fuel Tanks for Use to 250 °F (121 °C)
AMS-C-27725 TYPE (1, 2 or 3)
MANUFACTURER'S IDENTIFICATION
NAME OF MANUFACTURER
LOT NUMBER
DATE OF MANUFACTURE
SUBMITTED BY (NAME) (DATE) FOR QUALIFICATION TESTS IN ACCORDANCE WITH AMS-C-27725B UNDER AUTHORIZATION
(REFERENCE AUTHORIZING LETTER)

4.5 Approval and Reapproval

4.5.1 Coating supplied to this specification shall be listed, or approved for listing, on the qualified products list, PRI QPL-AMS-C-27725.

4.5.2 Qualification testing, review of test results, approval, re-approval and recertification of qualification for QPL listing shall be in accordance with PD 2000.

4.5.3 Recertification of qualification is required every three years. Recertification consists of a letter certifying that there have been no changes in the material ingredients, manufacturing processes, or site of production since qualification and that the product meets all of the requirements of this specification. In addition a test report shall be provided from a lab of the manufacturer's choosing, showing compliance with all of the qualification tests.

4.5.4 Manufacturer shall use ingredients, manufacturing procedures, processes, and methods of inspection on production coating which are essentially the same as those used on the approved (qualified) sample. If necessary to make any change in product formulation, raw materials, basic methods of processing, or plant site, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample coating. Production coating made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5.5 The manufacturer shall submit a statement of any proposed changes per 4.5.4 to PRI for review by the applicable SAE G-8 Qualified Products Group (QPG). The QPG may elect to reapprove without testing, or they may require partial or full requalification testing to be performed before the manufacturer may ship product with the PRI QPL-AMS-C-27725 seal.

4.6 Test Methods

Testing shall be as follows:

4.6.1 Standard Conditions

4.6.1.1 Test Conditions

Standard laboratory conditions shall be 77 °F ± 2 (25 °C ± 1) and 50 percent ± 5 relative humidity. Except as otherwise specified herein, all test specimens shall be cured under these conditions.

4.6.1.2 Standard Tolerances

Unless otherwise specified herein, Table 2 shows standard tolerances applied throughout test methods.

TABLE 2 - STANDARD TOLERANCES

Measurement Units	Tolerance
Temperatures	±2 °F (±1 °C)
Days	±2 hours
Hours	±5 minutes
Minutes	±10 seconds
Inches (mm)	±0.010 inch (0.25 mm)

4.6.2 Preparation of Test Panels

4.6.2.1 Description of Panels

Panel sizes and quantities shall be as shown in Table 3. Test panels shall be cut to the required dimensions prior to chemical treatment.

a. Class A: Bare aluminum alloy (7075) conforming to AMS 4045, temper T6, with chemical treatment in accordance with AMS 2473 or MIL-C-5541.
b. Class B: Bare aluminum alloy (7075) conforming to AMS 4045, temper T6, sulfuric acid anodized in accordance with AMS 2471 or MIL-A-8625.

TABLE 3 - PANEL SIZE REQUIREMENTS

		Quantity Required Panel Class A	Quantity Required Panel Class B
Size 1	0.040 x 2.75 x 6 inches (1 x 70 x 150 mm)	19	10
Size 2	0.040 x 2.75 x 12 inches (1 x 70 x 300 mm)	4	4
Size 3	0.025 x 1 x 5 inches (0.64 x 25.4 x 127 mm)	2	1

4.6.2.2 Cleaning

Unless otherwise specified herein, all test panels shall be cleaned by scrubbing and rinsing with ASTM D 740 methyl ethyl ketone. After rinsing, and while still wet, the panels shall be wiped dry with a clean AMS 3819 Grade A cloth and allowed to air-dry 30 minutes at standard conditions in an uncontaminated atmosphere.

4.6.3 Preparation of Test Specimens

4.6.3.1 Preparation of Coating Materials

The coating materials shall be prepared according to manufacturer's instructions.

4.6.3.2 Application of Coating Materials

Unless otherwise specified herein, the test panels shall be spray-coated to produce a dry film thickness of 0.0008 to 0.0012 inch (20 to 30 µm). Unless otherwise specified, the panels shall be coated on one side. Unless otherwise specified in the procurement documents, the coated panels shall be cured for 21 days (Types 1 and 3) or 14 days (Type 2) at standard conditions by suspending or placing in a vertical position.

4.6.3.3 Preparation of Sealing Compound

Not less than 175 grams of sealing compound conforming to AMS 3276, Class B-2, shall be mixed thoroughly within a period of 5 to 10 minutes.

4.6.3.4 Application of Sealing Compound

Unless otherwise specified herein, sealing compound shall be applied to test panels and cured for 14 days at standard conditions. Cured thickness of the sealing compound shall be 1/8 to 1/4 inch (3.2 to 6.4 mm).

4.6.4 Testing Fluids

Fuel used for immersion tests shall be jet reference fluid conforming to AMS 2629, Type 1.

4.6.5 Test Procedures

4.6.5.1 Application and Surface Appearance

Test panels prepared in accordance with 4.6.3.2 and shall be examined for smoothness and uniformity and shall be free of bubbles, pinholes, cracks, and other film irregularities. Additional panels spray-coated to produce a dry film thickness of 0.0018 to 0.0025 inch (46 to 64 µm) and accelerated cured per 3.2.7 shall also meet this requirement.

4.6.5.2 Density

This test shall be conducted in accordance with ASTM D 1475.

4.6.5.3 Volatile Organic Compound Content (V.O.C.)

The test shall be conducted in accordance with ASTM D 3960.

4.6.5.4 Viscosity

The viscosity test shall be conducted in accordance with ASTM D 1200, using No. 4 Ford viscosity cup.

4.6.5.5 Application Life

A round, wide mouth, 1-pint (1/2-L), metal container with a press lid shall be filled to within 1 inch (25 mm) of the top with coating material. The container of mixed coating shall be allowed to remain uncovered and undisturbed for not less than 4 hours at standard conditions. The aged coating material shall be examined for skinning and gelling. In addition the coating material shall be tested for conformance to viscosity (4.6.5.4), drying time (4.6.5.6), cure time (4.6.5.7), resistance to water (4.6.5.8), resistance to salt water and fuel (4.6.5.9). For acceptance testing of application life, the viscosity test (4.6.5.4) is the only test required.

4.6.5.6 Drying Time

Two Class A panels, Size 1, shall be coated to the thickness specified in 4.6.3.2. The coated panels shall then be suspended from a suitable fixture at standard conditions for 2 hours. The coating shall be considered tack-free when slight finger pressure will not leave a mark. The surface shall not be tacky. These panels upon further conditioning, shall be used for testing cure time as specified in 4.6.5.7.

4.6.5.7 Cure Time

Coated panels shall be selected from the drying time test 4.6.5.6. One panel shall be allowed to cure for 21 days (Types 1 and 3) or 14 days (Type 2) at standard conditions. The other panel shall be cured 1 day at standard conditions followed by 1 day at 140 °F ± 2 (60 °C ± 1) and not less than 50 percent relative humidity. The coating shall be considered cured when the substrate is not exposed after 50 double strokes of moderate pressure with a cotton gauze pad wet with ASTM D 740 methyl ethyl ketone.

4.6.5.8 Resistance to Water

One panel each of Class A and Class B, Size 1 shall be coated and cured as specified in 4.6.3.2. The coated panels shall be scored 0.03 inches (0.75 mm) minimum width through to the metal diagonally from one corner to the opposite corner. The coated panels shall be immersed vertically for 30 days in a covered glass vessel containing distilled water with 3 inches (76.2 mm) of the panels exposed to the water and remainder exposed to the air-vapor-mixture. The vessel shall be placed in an oven at 140 °F ± 2 (60 °C ± 1). Immediately upon removal from the water, the panels shall be examined for conformance to the requirements specified in 3.2.8. Softening and loss of adhesion shall be tested per 4.6.5.20 and 4.6.5.21 respectively.

4.6.5.9 Resistance to Salt Water and Fuel

Four panels each of Class A and Class B, Size 2, shall be coated and cured as specified in 4.6.3.2. Two coated panels each of Class A and Class B shall be scored 0.03 inches (0.75 mm) minimum width through to the metal diagonally from one corner to the opposite corner. The remaining coated panels shall be left unscored. The coated panels shall be immersed vertically in a covered glass vessel containing a two-layer liquid consisting of 3.0 percent aqueous sodium chloride solution and jet reference fluid, and the remainder to the air-vapor mixture. The vessel shall be placed in an oven at 140 °F ± 2 (60 °C ± 1). After 7 days immersion, the unscored panels shall be removed from the test fluid for use as specified in 4.6.5.14. At the end of 30 days, the scored panels shall be removed from the test fluid and immediately examined for conformance to the requirements specified in 3.2.9. Softening and loss of adhesion shall be tested per 4.6.5.20 and 4.6.5.21 respectively.

4.6.5.10 Resistance to Engine Oil

One panel each of Class A and Class B, Size 1, shall be coated and cured as specified in 4.6.3.2. Coated test panels shall be scored 0.03 inches (0.75 mm) minimum width through to the metal diagonally from one corner to the opposite corner. The coated panels shall be immersed completely and vertically for 14 days in a covered glass vessel containing engine oil conforming to MIL-PRF-23699. The temperature during the test shall be 250 °F ± 5 (121 °C ± 2). Immediately upon removal from the oil, the panels shall be examined for conformance to the requirements specified in 3.2.10. Softening and loss of adhesion shall be tested per 4.6.5.20 and 4.6.5.21 respectively.

4.6.5.11 Resistance to Hydraulic Fluid

One panel each of Class A and Class B, Size 3, shall be coated and cured as specified in 4.6.3.2. Coated test panels shall be scored 0.03 inches (0.75 mm) minimum width through to the metal diagonally from one corner to the opposite corner. The coated panels shall be immersed completely and vertically for 14 days in a covered glass vessel containing hydraulic fluid conforming to MIL-PRF-83282. The temperature during the tests shall be 180 °F ± 5 (82 °C ± 2). Immediately upon removal from the fluid, the panels shall be examined for conformance to the requirements specified in 3.2.11. Softening and loss of adhesion shall be tested per 4.6.5.20 and 4.6.5.21 respectively.

4.6.5.12 Fuel Contamination

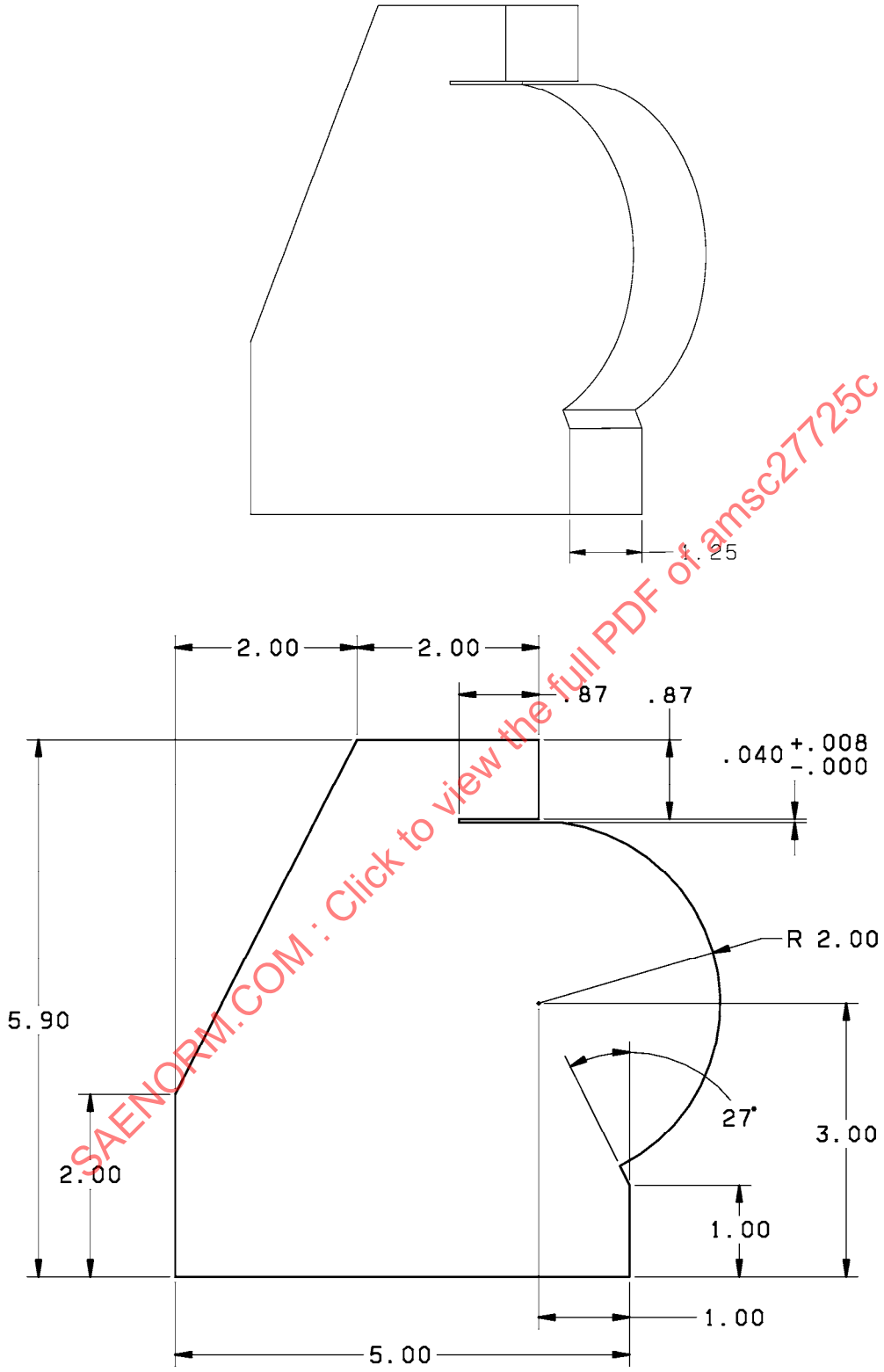
One Class A panel, Size 3, shall be coated on both sides, cured as specified in 4.6.3.2 and immersed in a flask containing 250 ml of jet reference fluid specified in 4.6.4 for 48 hours at standard conditions. The contaminated fuel shall be decanted off and the nonvolatile material determined by ASTM D 1353 at a temperature of 320 to 329 °F (160 to 165 °C), except that the total evaporation time shall be 45 minutes. A corrosion test for free sulfur shall be run in accordance with method 5313 of FED-STD-791, except that a nonleaded copper strip conforming to ASTM B 36 shall be suspended in the contaminated fluid during the 48-hour extraction period previously outlined.

4.6.5.13 Low-Temperature Flexibility

Two panels each of Class A and Class B, Size 1, shall be coated and cured as specified in 4.6.3.2. The coated panels and the flexibility jig (see Figure 1) shall be subjected to a temperature of -65 °F (-54 °C) for 2 hours. While at this temperature, one panel end shall be held in the slotted position and the other end bent rapidly around the curved position of the jig with the side coated with the material on the exterior of the radius. Remove panel from jig and repeat for additional panels. The panels then shall be removed and examined for conformance to the requirements specified in 3.2.13.

4.6.5.14 Peel Strength Sealing Compound to Coating Materials

Two panels each of Class A and Class B panels removed from the two-layer salt water-fuel test fluid in 4.6.5.9, shall be cleaned with ASTM D 740 methyl ethyl ketone ed. Test panels shall be dried 30 minutes minimum at standard conditions (or use the manufacturer's recommendation, if applicable). The center 4 inches (102 mm) of the panel shall be coated with an approximately 1/8-inch (3.2-mm) thickness of sealing compound conforming to AMS 3276, Class B-2. After the sealing compound has immobilized, one end of a 2.75 by 12 inch (69.8 by 305 mm) strip of wire screen (20 to 40 mesh (.842 to .420 mm sieve opening) aluminum or Monel wire fabric) or cotton duck cloth shall be impregnated with the sealing compound, so that approximately 5 inches (127 mm) at one end is completely covered on both sides. The sealant coated end of the fabric shall be placed on the sealant coated panel, and smoothed down on the layer of sealing compound, taking care not to trap air beneath the fabric. An additional coating of sealing compound shall be applied over the fabric approximately 0.031 inch (0.79 mm) thick. Cure the sealant as specified in 4.6.3.4. After the sealing compound cure period, the panels shall be replaced in the same two-layer salt water-fuel test fluid and allowed to remain for 7 days at a temperature of 140 °F ± 2 (60 °C ± 1). The test panels shall be removed and two 1-inch (25-mm) sections shall be cut through the strip and sealing compound on each panel to provide two strips for the peel test. The specimens shall be stripped back at an angle of 180 degrees to the metal panel in a suitable tensile testing machine having a jaw separation rate of 2 inches (51 mm) per minute. Three cuts approximately 1 inch (25 mm) apart shall be made perpendicular to the direction of pull through the sealing compound and coating to the panel in an attempt to promote adhesive failure. The results shall be the numerical average of the peak loads. The peel strength shall be measured within 1 hour after removal from the test fluid for conformance to 3.2.14. Failure of the sealant compound to the fabric shall not be included in peel strength values.



MATERIAL: MAPLE WOOD
DIMENSIONS: INCHES
TOLERANCES: +/-.030 UNLESS OTHERWISE SPECIFIED

FIGURE 1 - LOW-TEMPERATURE FLEXIBILITY FIXTURE

4.6.5.15 Adhesion, Coating to Sealing Compound

Four panels each of Class A and Class B, Size 1, shall be coated with sealing compound conforming to AMS 3276, Class B-2, 1/8 inch (3.2 mm) thick, and cured as specified in 4.6.3.4. On two panels each of Class A and Class B, a coat of the coating material shall be 0.0012 inch (30 µm) maximum, applied over the sealing compound and cured as specified in 4.6.3.2 except that the coating thickness shall be not less than 0.0008 inch (20 µm). The remaining two panels shall be left uncoated to provide control panels. All the panels shall be tested for flexibility in accordance with AS5127/1 paragraph 7.6 (Low-Temperature Flexibility) at -65 °F ± 2 (-54 °C ± 1) and examined for conformance to requirements specified in 3.2.15.

4.6.5.16 Repairability

One panel each of Class A and Class B, Size 1, shall be coated and cured as specified in 4.6.3.2. The coated panels shall be immersed vertically for 7 days in a covered glass vessel containing jet reference fluid with 3 inches (76 mm) of the panels exposed to the jet reference fluid and the remainder exposed to the air-vapor mixture. The temperature during the test shall be 140 °F ± 2 (60 °C ± 1). After immersion for 7 days, the panels shall be removed from the test fluid and air-dried for 24 hours at 140 °F ± 2 (60 °C ± 1) in a forced draft oven. The panels then shall be cleaned with the cleaner specified in 4.6.2.2. A second coat of the coating material shall be applied and cured as specified in 4.6.3.2. The test panels shall be replaced in the same test fluid and allowed to remain for 7 days at a temperature of 140 °F ± 2 (60 °C ± 1). The test panels shall be removed and examined for conformance to the requirements specified in 3.2.16.

4.6.5.17 Accelerated Storage Stability

Approximately 1 gallon (4 L) of the coating material in the containers, of the kind to be used in filling contract orders, shall be stored unopened for 14 days at 120 °F ± 2 (49 °C ± 1) and then cooled at standard conditions for 24 hours. The aged material shall be used to determine conformance to the requirements specified in 3.2.17.

4.6.5.18 Resistance to Iron Chloride

4.6.5.18.1 One Class A panel, Size 1, shall be coated on both sides, with a double coating on the edges, and cured as specified in 4.6.3.2. The coated panel shall be immersed completely and vertically for 10 days in a covered glass vessel containing a liquid consisting of 0.5 percent by weight of ferric chloride (technical grade) in distilled water. The temperature during the test shall be 140 °F ± 2 (60 °C ± 1). Immediately upon removal from the fluid, the panel shall be rinsed in clean water and examined for conformance to the visual requirements specified in 3.2.18.

4.6.5.18.2 After visual examination, the test specimen used in 4.6.5.18.1 shall be used for measuring electrical resistance. The test shall be conducted in accordance with ASTM D 257, using a megohmmeter with a potential of 500 volts. (A continuity check should be made prior to applying the test current to determine if sufficient resistance is provided by the specimen to prevent a direct short.) The test current shall be introduced by means of a brass disk, 1 inch in diameter and weighing not less than 50 grams, positioned over a coated area not nearer than 1/4 inch (4.6 mm) from any edge of the specimen and with an electrode clamped to bare metal of the specimen. Readings shall be made 1 minute after application of current and shall continue until three values are obtained within 25 percent of each other. The average of these three values shall be used to determine conformance with the requirements specified in 3.2.18.