SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS3279C

Issued 1997-03
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Superseding AMS3279B

Sealing Compound, Sprayable For Integral Fuel Tanks and Fuel Cell Cavities, For Intermittent Use to 350 °F (177 °C)

RATIONALE

AMS3279C results from a Five Year Review and update of this specification. Standardization of titanium callout implemented by replacing AMS4901 with AMS4911.

1. SCOPE

1.1 Form

This specification covers one type of sprayable fuel resistant polythioether sealing compound supplied as a two-component system.

1.2 Application

This sealing compound has been used typically for sealing metal and composite integral fuel tanks by spray application, but usage is not limited to such applications. It can be used for original fuel tank sealing of seams, joints, fasteners and fay surface edges or for repair of conventional fillet and fastener seals. As a fuel containment barrier, it can also be used on the interior or exterior of auxiliary fuel tanks and fuel cell cavities. It can be cured at ambient temperatures or with mild heat up to 140 °F (60 °C) following an initial 4 to 5 hour ambient cure period after each coating application. A primer, specified by the sealant manufacturer, is required with the sealing compound and must be applied prior to sealing. The sealing compound can be applied in fuel tank and non-fuel tank areas by the use of a spray gun. Sealant can be applied by brush for small touch-up areas. The sealing compound is usable long term from -65 to 250 °F (-54 to + 121 °C), with short term exposure (approximately 6 hours) to 350 °F (171 °C).

1.3 Classification

The sealing compound shall be usable for spray application and shall be supplied in the following types:

Type A - White
Type B - Black
Type C - Clear

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**

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 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.

AMS2471	Anodic Treatment of Aluminum Alloys, Sulfuric Acid Process, Undyed Coating
AMS2629	Fluid, Jet Reference Fluid
AMS3021	Fluid, Reference, for Testing Di-ester (Polyol) Resistant Material
AMS3276	Sealing Compound, Integral Fuel Tank and Fuel Cell Cavities, Intermittent Use to 360 °F (182 °C)
AMS3277	Sealing Compound, Polythioether, Integral Fuel Tanks and General Purpose, Fast Curing, Intermittent Use to 360 °F (182 °C)
AMS3819	Cloths, Cleaning, for Aircraft Primary and Secondary Structural Surfaces
AMS4045	Aluminum Alloy Sheet and Plate, 5.6 Zn - 2.5Mg - 1.6 Cu - 0.23 Cr (7075 -T6 Sheet, T651 Plate), Solution and Precipitation Heat Treated
AMS4049	Aluminum Alloy Sheet and Plate, 5.6 Zn - 2.5Mg - 1.6 Cu - 0.23 Cr (Alclad 7075 -T6 Sheet, T651 Plate), Solution and Precipitation Heat Treated
AMS4911	Titanium Alloy, Sheet, Strip, and Plate 6Al - 4V Annealed-UNS R56400
AMS-S-8802	Sealing Compound, Temperature Resistant
AMS-C-27725	Coating, Corrosion Preventive, for Aircraft Integral Fuel Tanks
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications
AS5127	Methods For Testing Aerospace Sealants (May, 1997. See 4.5.9)
AS5127/1	Methods For Testing Aerospace Sealants, Two-Component Synthetic Rubber Compounds (May, 1997. See 4.5.9)
AS7001	National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Program Description
AS7002	National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Rules for Implementation
AS7003	National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Program Operation
AS7200/1	National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Audit and Inspection Procedures and Checklists for the Sealant Manufacturers Accreditation Program
AS7201	National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Requirements for Accreditation of Pass-Thru Distributors
AS7202	National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Requirements for Accreditation of Value Added Distributors
AS7202/1	National Aerospace and Defense Contractors Accreditation Program (NADCAP) - Inspection Checklists for the Sealant Manufacturers Accreditation Program

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 D 412	Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
ASTM D 1974	Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
ASTM D 2240	Test Method for Rubber Property-Durometer Hardness
ASTM D 3960	Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings

2.3 PRI Publications

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

PD 2000	Procedures for an Industry Qualified Product Management Process

3. TECHNICAL REQUIREMENTS

3.1 Materials

The basic ingredient used in the manufacture of these products shall be isocyanate-terminated polythioether synthetic polymer. The sealing compound shall cure by the addition of a curing agent to the base compound, and shall not depend on solvent evaporation for curing. The material shall contain no lead compounds. The curing agent shall possess sufficient color contrast to the base compound to permit easy identification of an unmixed or incompletely mixed sealing compound. Neither the base compound nor the cured sealant shall be red or pink in color. A primer, as recommended by the manufacturer, is required.

3.1.1 Qualification

All products sold to this specification shall be listed, or approved for listing, on the qualified products list, PRI QPL AMS3279. The qualified products list shall be in accordance with PD 2000.

3.2 Quality

The base compound and the curing agent (accelerator), as received by the purchaser, shall each be of uniform blend and shall be free of excessive air, skins, lumps, and gelled or coarse particles. There shall be no separation of ingredients that cannot be readily dispersed.

3.2.1 Volatile Content

The mixed sealant shall have a maximum volatile organic compound content (VOC) of 600 grams/liter (g/l) when tested in accordance with ASTM D 3960.

3.2.2 Sprayed Film Appearance

Sprayed films of mixed sealant shall be uniform and free of bubbles and blisters when tested in accordance with 4.6.5.3.

3.3 Properties

The sealing compound shall conform to the requirements shown in Table 1, determined in accordance with the indicated test methods:

TABLE 1 - PROPERTIES

Paragraph	Property	Requirement	Test Method
3.3.1	Nonvolatile Content, by weight, min	50%	4.6.1
3.3.2	Viscosity of Base Compound	100 to 400 poises (10 to 40 Pa·S)	4.6.2
3.3.3	Viscosity of Curing Agent	5 poises (0.5 Pa·S) max	4.6.3
3.3.4	Flow	0.2 inch (5.08 mm) max	4.6.4
3.3.5	Application Time, min	From the beginning of mixing the viscosity shall not exceed 200 poises (20 Pa·s) at two hours. It shall remain suitable for spray application during the two hour period	4.6.5
3.3.6	Tack-Free Time (Measured from beginning of mixing), hours, max	6 hours	4.6.6
3.3.7	Standard Cure Time to reach 30 Durometer A, hours, max	36	4.6.7
3.3.8	Fluid Immersion Cure Time to reach 40 Durometer A, hours, max	48	4.6.8
3.3.9	Specific Gravity, max	1.25	4.6.9
3.3.10	14-Day Hardness, min	65 Durometer A	4.6.10
3.3.11	Hydrolytic Stability	650 psi (4480 kPa) 700% elongation	4.6.11
3.3.12	Chalking	None	4.6.12
3.3.13	Resistance to Thermal Rupture, max	No blistering or sponging 5/32 inch (4 mm) Deformation, max	4.6.13
3.3.14	Weight Loss & Flexibility Weight Loss, Max Flexibility	 8% No cracking or checking	4.6.14
3.3.15	Volume Swell	5 to 30% swell	4.6.15
3.3.16	Low Temperature Flexibility	No visual evidence of cracking, checking or loss of adhesion	4.6.16
3.3.17	Tensile Strength and Elongation, min		4.6.17
3.3.17.1	Standard Cure	1300 psi (8963 kPa), 700% elongation	
3.3.17.2	After 14 days at 140 °F (60 °C) in AMS2629, Type I	900 psi (6205 kPa), 700% elongation	
3.3.17.3	After 8 hours at 350 °F (177 °C) in Air	150 psi (1034 kPa) 100% elongation	

TABLE 1 - PROPERTIES (CONTINUED)

Paragraph	Property	Requirement	Test Method
3.3.17.4	After 3 days at 140 °F (60 °C) in AMS2629, Type I, followed by 3 days at 120 °F (49 °C) in Air + 7 days at 250 °F (121 °C) in Air	700 psi (4826 kPa), 350% elongation	
3.3.17.5	Standard Heat Cycle as in by 7 days at 40 °F (60 °C) in AMS2629, Type I	150 psi (1380 kPa), 120% elongation	
3.3.18	Corrosion	No physical evidence of corrosion	4.6.18
3.3.19	Peel Strength, min	20 lbf/inch (3580 N/m) /100% cohesive failure	4.6.19
3.3.20	Repairability, min	5 lbf/inch (876 N/m) 100% cohesive failure	4.6.20
3.3.21	Storage Stability		4.6.21
3.3.21.1	Accelerated Storage		
	Viscosity of Base Compound	Same as 3.3.2	
	Application Time	Same as 3.3.5	
	Tack Free Time	Same as 3.3.6	
	Standard Cure Time	Same as 3.3.7	
	Peel Strength (4 Aluminum panels, sulfuric acid anodized in accordance with AMS2471 and coated with AMS-C-27725, Type II, Class B (See 8.6) 2 panels in AMS2629 Type I; 2 panels in AMS2629 Type I /3% saltwater; all at 140 °F (60 °C) for 7 days	20 lbf/inch (1750 N/m) /100% cohesive failure	
3.3.21.2	Long Term Storage		
	Viscosity of Base Compound	Same as 3.3.2	
	Application Time, min	Same as 3.3.5	
	Tack Free Time	Same as 3.3.6	
	Standard Cure Time	Same as 3.3.7	
	Peel Strength (4 Aluminum panels, sulfuric acid anodized in accordance with AMS2471 and coated with AMS-C-27725, Type II, Class B (See 8.6) 2 panels in AMS2629 Type I; 2 panels in AMS2629 Type I /3% saltwater; all at 140 °F (60 °C) for 7 days	20 lbf/inch (1750 N/m) /100% cohesive failure	

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The manufacturer of the sealing compound shall supply all samples and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and perform any confirmatory testing deemed necessary to ensure that the sealing compound conforms to specified requirements.

4.1.1 Source Inspection (NADCAP)

Material procured under this specification shall be third party approved prior to shipment, to ensure that material meets final acceptance tests (4.1.3). Third party approval shall be by a third party accreditation process in accordance with AS7001, AS7002, AS7003, and AS7200/1. Sealant shall be from a manufacturer that currently holds a third party accreditation and shall be from a batch of material that has been third party source inspected in accordance with AS7200/1. Distributors supplying sealant shall supply material from an accredited manufacturer and from a batch of material that has been third party source inspected. Distributors shall also be third party accredited in accordance with AS7201 or AS7202, whichever is applicable.

4.1.2 Initial Acceptance Tests

Initial acceptance tests of individual batches shall consist of the following:

Nonvolatile Content (3.3.1)
Viscosity of Base Compound[1] (3.3.2)
Viscosity of the Curing Agent[2] (3.3.3)
Flow (3.3.4)
Application Time (3.3.5)
Tack-Free Time (3.3.6)
14-Day Hardness (3.3.10)
Peel Strength (2 aluminum panels, AMS4045, sulfuric (3.3.19) acid anodized in accordance with AMS2471 and coated with AMS-C-27725 Type II Class B only (See 8.6) (7 day immersion only).

4.1.3 Final Acceptance Tests

Acceptance tests of the final packaged product shall consist of the following:

Application Time (3.3.5)
Tack-Free Time (3.3.6)
Standard Cure Time (3.3.7)

4.1.3.1 If the batch is being packaged in different type and/or different size containers, the final acceptance tests (4.1.3) shall be conducted on each type and/or each size containers. If the material is being procured under different purchase orders, but the purchases call for the same type and size containers, it is only necessary to conduct the final acceptance tests once.

4.2 Classification of Tests

4.2.1 Qualification Tests

All technical requirements listed in Table 1 are qualification tests (See 8.2) and shall be performed on the initial production of the sealing compound prior to shipment to a purchaser; or when a change in ingredients and/or processing requires reapproval as in 4.4.2; and when purchaser deems confirmatory testing to be required.

[1] Acceptance testing of Viscosity of Base Compound shall be conducted on material in 1-quart or 1-liter cans regardless of type of packaging being procured. Testing viscosity of curing agent need not be performed in sectionalized containers of small size, less than 8 ounces (235 mL).
[2] See Footnote 1.

4.2.1.1 Application Requirements

Application requirements define properties of the uncured sealant that may affect the application parameters of the sealant, but have little or no effect on the performance properties of the cured sealant. Minor variations in the application requirements during acceptance testing may not be cause for rejection if approved by the procuring agency. Application requirements are listed below:

Nonvolatile Content (3.3.1)
Viscosity of Base Compound (3.3.2)
Viscosity of Curing Agent (3.3.3)
Flow (3.3.4)
Application Time (3.3.5)
Tack-Free Time (3.3.6)

4.3 Sampling and Testing

4.3.1 Acceptance Tests

4.3.1.1 Batch and Lot

A batch shall be defined as the quantity of material run through a mill or mixer at one time. A lot shall be defined as material from one batch of each component assembled (packaged) as finished product in one size and/or type of container at the same time. The lot, when used shall be traceable to the batches of base compound and curing agent.

4.3.1.2 Contractor Initial and Final Acceptance Tests

Each batch shall be subjected to both initial and final acceptance testing. Sufficient material for initial acceptance testing shall be packaged in the same type containers that are being procured. Initial acceptance tests are those listed in 4.1.2. After successful completion of the initial acceptance tests, the batch shall be released for final packaging. During packaging, test kits shall be selected at random for final acceptance testing. Final acceptance testing is to be conducted on the final packaged product and shall consist of those tests outlined in 4.1.3. Sealing compound being submitted for initial acceptance testing (4.1.3) shall be packaged in the same type containers that are being procured. After successful completion of the initial acceptance tests, the batch shall be released for final packaging. During packaging, test kits shall be selected at random for final acceptance testing. Final acceptance testing shall be conducted on the final packaged product and consist of those tests outlined in 4.1.3.

4.3.1.3 If the material is being procured in cans, pails, or drums, the batch shall be tested on the material placed in 1-quart (1-L) cans.

4.3.2 Statistical Sampling Plan

A statistical sampling plan, acceptable to the purchaser, may be used in lieu of sampling as in 4.3.3 and the report for 4.7 shall state that such plan was used.

4.3.3 Acceptance Test Samples

Sufficient material shall be taken at random from each batch to perform all the required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified herein, a minimum of three. Multiple testing is not required for viscosity, application time, flow, tack-free time and hardness.

4.3.4 Qualification Test Samples

Samples shall consist of thirty 1-pint (473-mL) two component kits with the appropriate amount of primer plus two 1-quart (1-L) cans, plus 1-quart (1-L) container of accelerator. Samples shall be identified as follows and forwarded to the activity responsible for testing as designate in the letter of authorization from that activity.

SEALING COMPOUND, POLYTHIOETHER, INTEGRAL FUEL TANK AND FUEL CELL CAVITIES, FOR INTERMITTENT USE TO 350 °F (171 °C)
Manufacturer's Identification
Name of Manufacturer
Lot Number
Date of Manufacture*
Submitted by (name) (date) for qualification tests in accordance with AMS3279 on Samples label.
*Date the acceptance tests are completed by the sealant manufacturer.

4.3.5 Shelf Life

The sealing compound shall have a minimum shelf life of six months from the date of packaging when stored unopened below 80 °F (27 °C).

4.3.6 Date of Packaging

The date of packaging is defined as the date the finished material is assembled from its components, base compound and curing compound, into a packaged and labeled kit or unit by the sealant manufacturer or re-packager. Date of packaging shall be no more than 90 days from the last day of full acceptance testing in accordance with 4.1.2. Material may be retested by the sealant manufacturer at any time to determine conformance to full acceptance testing in accordance with 4.1.2.

4.3.7 Shelf Life Surveillance and Updating

4.3.7.1 Sampling

The minimum number of samples to be tested during shelf-life surveillance and updating are shown in Table 2.

TABLE 2 - SAMPLING

Items in Stock	Samples to be Tested
Up to 100, excl	3
100 to 500, incl	5
Over 500	7

4.3.8 Testing

The following inspections are to be conducted for shelf-life surveillance and updating:

Condition of Container
Viscosity of Base Compound (3.3.2)
Viscosity of Curing Agent (3.3.3)
Application Time (3.3.5)
Tack-Free Time (3.3.6)
Standard Cure Time (3.3.7)

Peel Strength: two aluminum panels, sulfuric (3.3.19) acid anodized per AMS2471, coated with AMS-C-27725 Type II Class B corrosion preventive coating (See 8.6), and aged in AMS2629, Type I for 7 days at 140 °F (60 °C).

4.3.8.1 Tests are to be conducted in accordance with test methods outlined in this specification for acceptance tests. If the tests are being performed at the end of the stated shelf life to update the shelf life of the sealing compound, and all tests are passed, the shelf life will be extended an additional three months. Up to three extensions will be allowed.

4.4 Approval

4.4.1 Sealing compound supplied to this specification shall be listed, or approved for listing, on the qualified products list, PRI QPL AMS3279.

4.4.2 Manufacturer shall use ingredients, manufacturing procedures, processes, and methods of inspection on production product that is essentially the same as those used on the approval sample. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample product. Production product made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods

4.5.1 Standard Tolerances

Unless otherwise specified herein, standard tolerances of AS5127 under (3.1) "Standard Tolerances" shall apply.

4.5.2 Standard Test Conditions

Standard laboratory conditions shall be as specified in AS5127 (4). Test specimens shall be prepared at standard conditions and immediately after completion of preparation, shall be placed under 77 °F (25 °C) and 50 ± 5% relative humidity to cure according to 4.5.8. Except as otherwise directed herein, tests shall be performed at Standard Conditions as in AS5127 (4).

4.5.3 Standard Heat Cycle

When directed herein, the Standard Heat Cycle to which sealants shall be exposed shall consist of the following:

Six cycles as follows:
Four hours at 260 °F (127 °C), plus
40 minutes at 320 °F (160 °C), plus
One hour at 360 °F (182 °C).
Cool to under 100 °F (38 °C)

4.5.4 Preparation of Test Specimens

Test specimens shall be prepared in accordance with AS5127 (6).

4.5.4.1 Cleaning of Test Panels

Test panels shall be cleaned in accordance with Table 3 and methods in accordance with AS5127 (6).

NOTE: When organic coatings are specified for the test panels, the coatings shall be fully cured as defined by the applicable coating specification before cleaning. The applied coatings shall be at least 14 days old and a maximum of 6 months old stored at ambient indoor temperatures.

4.5.4.2 Graphite Epoxy AS 4/3501-6 test panels shall be prepared in accordance with AS5127 (6.5).

4.5.4.3 Bismaleimide IM7/5250-4 test panels shall be prepared in accordance with AS5127 (6.5).

TABLE 3 - CLEANING OF TEST PANELS

Panel Material	Cleaning Method, AS5127 (Paragraph)	
Aluminum alloy, sulfuric acid anodized	(6.1.1)	"Preparation of Aluminum Panel Test Surfaces"
AMS4911 Titanium alloy	(6.4)	"Preparation of AMS4911 Titanium Panel Test Surfaces"
Aluminum alloy, AMS-C-27725 Type II Class B (See 8.6) test surface	(6.2.1.1)	"Cleaning of MIL-C-27725 Surface for Sealing"
Graphite epoxy composite AS 4/3501-6	(6.5.1)	"Cleaning of AS 4/3501-6, IM7/5250-4 and Other Composite Surfaces"
Bismaleimide (BMI) resin, Graphite composite	(6.5.1)	"Cleaning of AS 4/3501-6, IM7/5250-4 and Other Composite Surfaces"
Aluminum alloy, MIL-PRF-23377 test surface	(6.2.2)	"Cleaning of MIL-P-23377 Surface for Sealing"
Aluminum alloy, MIL-PRF-85285 test surface	(6.2.3.1)	"Cleaning of MIL-C-83282 Surface for Sealing"

4.5.4.4 Preparation of Peel Strength Test Panels

Test panel configuration shall be in accordance with AS5127/1 under (8.) "Peel Strength Properties" and (8.1) "Peel Strength Testing" and as in either Figure 22 "Five-Inch Peel Specimen Configuration", or in Figure 23 "Four-Inch Peel Specimen Configuration".

4.5.5 Application of Adhesion Promoter

Adhesion promoter shall be applied in accordance with AS5127/1 (6.7) "Application of Adhesion Promoter".

4.5.6 Preparation of Sealing Compound

Sealing compound shall be prepared in accordance with AS5127/1 under (4.) "Preparation of Sealing Compound" and subparagraphs (4.1) "Qualification Testing", (4.2) "Acceptance Testing".

4.5.7 Application of Sealing Compound

Unless otherwise specified herein, test panels shall be given an application of sealing compound to produce the specified dry sealant thickness. The dry sealant thickness will be approximately 50% of the applied wet thickness. Sealant specimen preparation shall be by spray method for qualification testing. Either spray or casting methods may be used for acceptance test specimen preparation. Do not apply wet sealant more than 0.125 inch (3.18 mm) thick. If additional sealant is needed to obtain a specific dry thickness, allow the wet coating to dry eight hours minimum and twenty-four hours maximum at standard conditions (4.5.2) before adding additional sealant.

4.5.8 Curing of the Sealing Compound

The sealing compound shall be cured for 14 days at standard conditions (4.5.2) for wet sealant thickness up to 0.125 inch (3.18 mm). For test specimens requiring higher wet sealant thickness, the sealing compound shall be cured after the final layer application for 21 days at standard conditions (4.5.2). An accelerated cure of 48 hours at standard conditions (4.5.2), plus 48 hours at 140 °F (60 °C) may be used for acceptance testing. Tests on the cured sealing compound shall commence not more than two days after the completion of the specified cure.

4.5.9 Standard Test Methods

Standard Test Methods are in accordance with AS5127 and AS5127/1. In the event of a conflict between the text of this document and AS 5127 and/or AS5127/1, the text of this document takes precedence.

4.5.9.1 Use of the May 1997 issues of AS5127 and AS5127/1 is for clarity.

4.5.10 Future Revisions of AS5127 and AS5127/1

Future revisions of AS5127 and AS5127/1, when published, shall be used providing test methods correspond in kind to those of the issues listed in 2.1.

4.6 Test Procedures

4.6.1 Nonvolatile Content

See AS5127/1 (5.1).

4.6.2 Viscosity of Base Compound

See AS5127/1 (5.3).

4.6.3 Viscosity of Curing Agent

See AS5127/1 (5.4).

4.6.4 Flow (Class B only)

4.6.4.1 Prepare a 0.040 inch x 2.75 inch x 6 inches (1.02 mm x 69.8 mm x 152 mm) AMS4049 aluminum alloy panel having a horizontal scribed line across the panel width at the panel midpoint, and a second scribed line 0.2 inch (5.08 mm) distance from the first line. Clean the panel in accordance with 4.5.4.1. Apply the edge of a strip of one-inch wide masking tape on the midpoint line with the tape also covering the second, 0.2 inch (5.08 mm) scribed line.

4.6.4.2 Within ten minutes from the beginning of mixing, spray a 0.050 inch (0.127 mm) thick wet sealant coating in one application to cover one-half of the panel surface and extending at least one-inch over the midpoint line and the tape.

4.6.4.3 Within two minutes after sealant application, score a line through the coating with a sharp blade at the midpoint line. Remove the masking tape and place the panel on the uncoated 2.75 inch (69.8 mm) end at a 90 degree vertical position.

4.6.4.4 Thirty minutes after completion of the sealant application, inspect the panel for sealant flow below the midpoint line.

4.6.5 Application Time

4.6.5.1 The base compound and the curing agent shall be stabilized at standard conditions (4.5.2) for not less than eight hours before a sample of the base compound is mixed with the proper amount of curing agent sufficient to fill a standard 0.5-pint (1/4-L) can, 2.875 inches (73.02 mm) high, to within 0.5 inch (13 mm) of the top. The container shall be tightly covered except when testing for viscosity.

4.6.5.2 At the end of two hours, measured from the mixing period, the sealing compound shall be tested for viscosity using a Brookfield Model RVF viscometer, or equivalent. A Number 5 spindle at 10 rpm shall be used. The highest reading shall be taken after the instrument has run in the sealing compound for one minute.

4.6.5.3 Mixed sealant shall be sprayed to a wet thickness of 0.050 inch (1.27 mm) on two 0.040 inch x 2.75 inches x 6 inches (1.02 mm x 69.8 mm x 152 mm) clean AMS4049 aluminum alloy panels. One panel shall be sprayed 15 minutes after the beginning of mixing and one panel at two hours after the beginning of mixing. Cure both panels at standard conditions (4.5.2) for six hours. Inspect the sealant film appearance for conformance to 3.2.2.

4.6.6 Tack-Free Time

See AS5127/1 (5.8).

4.6.7 Standard Cure Time

See AS5127/1 (5.9).

4.6.8 Fluid Immersion Cure Time

See AS5127/1 (5.11).

4.6.9 Specific Gravity

See AS5127/1 (6.1).

4.6.10 14-Day Hardness

See AS5127/1 (6.2).

4.6.11 Hydrolytic Stability

See AS5127/1 (6.6).

4.6.12 Chalking

See AS5127/1 (6.7).

4.6.13 Resistance to Thermal Rupture

See AS5127/1 (7.2).

4.6.14 Weight Loss and Flexibility

See AS5127/1 (7.4).

4.6.15 Volume Swell

See AS5127/1 (7.5).

4.6.16 Low Temperature Flexibility

See AS5127/1 (7.6).

4.6.17 Tensile Strength and Elongation

See AS5127/1 (7.7).

4.6.18 Corrosion

4.6.18.1 Two AMS4045 aluminum alloy panels measuring 0.040 x 2.75 x 6 inches (1.02 x 69.8 x 152 mm) shall be prepared as follows: A controlled test area one inch (25 mm) wide by five inches (127 mm) long shall be masked in the center on one side of each panel; MIL-C-81706 chemical conversion coating shall be applied to the unmasked portion of each panel (4.5.4). The panels shall then be overcoated with AMS-C-27725. After the AMS-C-27725 coating has cured, the masking tape shall be removed. The unmasked area shall be cleaned in accordance with AS5127 (6.1.1), and the manufacturer's recommended primer shall be applied (4.5.5). A 0.062 inch (1.57 mm) thick layer of sealing compound shall be applied to the primed area, overlapping a minimum of 0.25 inch (6.4 mm) onto the AMS-C-27725 coated portion of each panel. The sealant shall be cured in accordance with (4.5.8).

4.6.18.2 The panels shall be immersed vertically in a covered glass vessel containing a two-layer liquid consisting of 3% aqueous sodium chloride solution and AMS2629, Type I fluid, so that approximately two inches (51 mm) is exposed to the salt solution, approximately two inches (51 mm) is exposed to AMS2629, Type I, and the remainder of the panels are exposed to an air/ vapor mixture above the liquid level. The temperature of the fluid mixture shall be 140 °F (60 °C) for 12 days, followed by 60 hours at 160 °F (71 °C), followed by 6 hours at 180 °F (82 °C) in an air circulating oven. Immediately upon removal of the panels from the liquid after the aging cycle, the sealant shall be removed by mechanical means using a nonmetallic scraper, and the panels shall be examined for any evidence of corrosion.

4.6.19 Peel Strength

4.6.19.1 The type and quantity of panels listed in Table 4 shall be used for the evaluation of peel strength. All panels shall be 2.75 x 6 inches (69.8 x 152 mm). The thickness of the panels shall be as listed in Table 4. The panels shall be prepared in accordance with AS5127/1 (8.1). Sealing compound shall cover 5 inches (127 mm) of one side of the panel surface in accordance with AS5127/1 (Figure 22). When specified, the manufacturer's recommended adhesion promoter shall be applied per 4.5.5.

4.6.19.2 The sealing compound shall be cured in accordance with 4.5.8. At the end of the cure, panels of each substrate shall be subjected to the immersion media listed in Table 4.

4.6.19.3 Fuel Cycle

One fuel cycle shall be 100 hours at 140 °F (60 °C) in AMS2629 Type I /3% saltwater, plus 10 hours at 160 °F (71 °C), plus 1 hour at 180 °F (82 °C) in AMS2629 Type I/3% saltwater. The test fluid shall be changed after each fuel cycle.

4.6.19.4 Acceptance Tests (only)

Prepare four AMS4045 aluminum alloy panels measuring) 0.040 x 2.75 x 6 inches (1.02 x 69.8 x 152 mm) sulfuric acid anodized in accordance with AMS2471 and coated with AMS-C-27725, Type II, Class B.

TABLE 4 - PEEL STRENGTH PANELS

Quantity Required	Panel Thickness, Inch (mm)	Panel Material	Immersion Media at 140 °F (60 °C)
6	0.040 (1.02)	Al alloy AMS4045 sulfuric acid anodized per AMS2471	2 panels in AMS2629 Type I for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater (See 4.6.19.3)
10	0.025 to 0.040 (0.64 to 1.02)	Titanium AMS4911 (Use Manufacturer's Recommended Adhesion Promoter)	2 panels in AMS2629 Type I for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater for 7 days 2 panels in AMS2629 Type I for 70 days 2 panels in AMS2629 Type I /3% by weight saltwater for 70 days 2 panels in AMS2629 Type I /3% by weight saltwater (See 4.6.19.3)
10	0.040 (1.02)	Al alloy AMS4045 sulfuric acid anodized per AMS2471, coated with AMS-C-27725 Type II Class B (See 8.6).	2 panels in AMS2629 Type I for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater for 7 days 2 panels in AMS2629 Type I for 70 days 2 panels in AMS2629 Type I /3% by weight saltwater for 70 days 2 panels in AMS2629 Type I; /3% by weight saltwater (See 4.6.19.3)
6	0.040 (1.02)	Al alloy AMS4045 sulfuric acid anodized per AMS2471, coated with MIL-PRF-23377, and cured 1 hour at 150 °F (66 °C)	2 panels in AMS2629 Type I for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater for 7 days
6	0.025 to 0.040 (0.064 to 1.02)	Al alloy AMS4045 sulfuric acid anodized per AMS2471, 0.001 inch (0.025 mm) overcoat of MMS-336 epoxy primer (See 8.7) and cured 1 hour at 150 °F (66 °C)	2 panels in AMS2629 Type I for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater (See 4.6.19.3)
8	0.025 to 0.040 (0.064 to 1.02)	Al alloy AMS4045 sulfuric acid anodized per AMS2471, 0.001 inch (0.025 mm) overcoat of MIL-PRF-23377, and coated with MIL-PRF-85285 urethane topcoat	2 panels in AMS2629 Type I for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater for 7 days 2 panels in MIL-PRF-83283 for 72 hours 2 panels in AMS3021 for 72 hours
10	0.040 (1.02)	Graphite epoxy composite AS 4/3501-6 (Apply sealing compound to tool side of panel)	2 panels in AMS2629 Type I for 7 days 2 panels in AMS2629 Type I /3% by weight saltwater for 7 days 2 panels in AMS2629 Type I for 70 days 2 panels in AMS2629 Type I /3% by weight saltwater for 70 days 2 panels in AMS2629 Type I /3% by weight saltwater (See 4.6.19.3)