

AEROSPACE MATERIAL SPECIFICATION

Issued MAR 1996
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Superseding AMS 3265

Sealing Compound, Polysulfide (T) Rubber,
Nonchromated, Corrosion Inhibiting
For Intermittent Use to 360 °F (182 °C)

1. SCOPE:

1.1 Form:

This specification covers polysulfide (T) rubber sealing compound containing only nonchromated corrosion inhibitors, supplied as two-component systems which cure at room temperature.

1.2 Application:

This sealing compound has been used typically for faying surface sealing and for wet-installation of fasteners in aircraft structural joints, but usage is not limited to such applications. It can be used in non-fuel areas for fillet sealing and overcoating fasteners, for sealing joints and seams, cabin pressure sealing, and aerodynamic smoothing. AMS 3100 adhesion promoter can be applied prior to application of the sealant. This material is usable for continuous service from -65 to 248 °F (-55 to + 120 °C), with short-term exposure (approximately 6 hours) to 360 °F (182 °C).

1.3 Classification:

Sealing compounds covered by this specification are classified by method of application and application times as follows:

Class A - Suitable for brush application. Available in the following application times in hours:

A-1/2

A-2

A-4

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1.3 (Continued):

Class B - Suitable for application by extrusion gun, spatula, brush, or roller. Available in the following application times in hours:

B-1/4
B-1/2
B-1
B-2
B-4
B-12

Class C - Suitable for extrusion gun, spatula, brush, or roller. Available in the following application times in hours:

Notation: C-x/y where

x = Application Time in hours,
y = Assembly Time in hours

C-2/2
C-8/24
C-12/48
C-48/168
C-96/336

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 any 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 following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2400	Cadmium Plating
AMS 2471	Anodic Treatment of Aluminum Alloys, Sulfuric Acid Process, Undyed Coating
AMS 2629	Fluid, Jet Reference Fluid
AMS 3020	Oil, Reference, for "L" Stock Rubber Testing
AMS 3021	Fluid, Reference, for Testing Diester (Polyol) Resistant Material
AMS 3100	Adhesion Promoter, for Polysulfide Sealing Compounds
AMS 3276	Sealing Compound, Integral Fuel Tank and Fuel Cell Cavities, 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, 5.6 Zn-2.5Mg-1.6 Cu-0.23Cr (7075 -T6 Sheet, T651 Plate), Solution and Precipitation Heat Treated
AMS 4049	Aluminum Alloy Sheet and Plate, 5.6 Zn-2.5Mg-1.6 Cu-0.23Cr (Alclad 7075 -T6 Sheet, T651 Plate), Solution and Precipitation Heat Treated
AMS 4901	Titanium Sheet, Strip and Plate, Annealed, 70,000 psi (485 Mpa) Yield Strength
AMS 4911	Titanium Sheet, Strip and Plate, 6Al, 4V Annealed
MAM 4911	Titanium Sheet, Strip and Plate, 6Al, 4V Annealed
AMS 5516	Steel, Corrosion Resistant, Sheet, Strip, and Plate, 18Cr-9.0Ni
AMS-C-27725	Coating, Corrosion Preventive, for Aircraft Integral Fuel Tanks (SAE 30302)
AMS-S-8802	Sealing Compound, Temperature Resistant
AS5127	Methods For Testing Aerospace Sealants (May, 1997. See 4.5.6)
AS5127/1	Methods For Testing Aerospace Sealants, Two-Component Synthetic Rubber Compounds (May, 1997. See 4.5.6)
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
PD 2000	Procedures For an Industry Qualified Product Management Process

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B117	Salt Spray (Fog) Testing
ASTM D 412	Vulcanized Rubber and Thermoplastic Rubber and Thermoplastic Elastomers in Tension
ASTM D 1974	Methods for Closing, Sealing and Reinforcing Fiberboard Boxes
ASTM D 2240	Durometer Hardness

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

A-A-59281	Cleaning Compound, Solvent Mixtures
PPP-C-96	Can, Metal, 28 Gage and Lighter
PPP-P-704	Pails, Metal: (Shipping, Steel, 1 through 12 Gallons)
PPP-P-729	Drums, Shipping and Storage, Steel, 55-Gallon (208 Liters) Type III
MIL-T-9046	Titanium and Titanium Alloy, Sheet Strip and Plate
MIL-PRF-23377	Primer Coatings: Epoxy Polyamide, Chemical and Solvent Resistant
MIL-S-38714	(Inactive) Sealant Cartridge for Two Component Materials
MIL-C-38736	Compound Solvent, for Use in Integral Fuel Tanks
MIL-L-81352	Lacquer, Acrylic, (For Naval Weapon Systems)
MIL-C-81706	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-PRF-85285	Coating, Polyurethane, High Solids
MIL-PRF-85582	Primer Coatings, Epoxy, Waterborne

3. TECHNICAL REQUIREMENTS:

3.1 Materials:

The basic ingredient used in the manufacture of these products shall be synthetic rubber of the Polysulfide (T) type with additive(s) for corrosion inhibition. The sealing compound shall cure by the addition of a curing agent to the base compound, and shall not depend on solvent evaporation or curing. The material shall contain no lead compounds or chromium 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. The base compound shall be of uniform blend and shall be free of skins, lumps, and gelled or coarse particles.

- 3.1.1 Qualification: All products sold to this specification shall be listed, or approved for listing, on the qualified products list, PRI QPL AMS 3265A. 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.

3.3 Properties:

The sealing compound and the curing agent shall conform to all requirements shown in Table 1, determined in accordance with the specified test methods.

TABLE 1 - Properties

Paragraph	Property	Requirement	Test Procedure (Paragraph)
3.3.1	Nonvolatile Content, by weight, min		4.6.1
	Class A	84%	
	Class B (Class B-2: see Note 2.)	92%	
	Class C	88%	
3.3.2	Air Content, max (Class B only)	4%	4.6.2
3.3.3	Viscosity of Base Compound		4.6.3
	Class A	100 to 600 poises (10 to 60 Pa·S)	
	Class B	9000 to 16000 poises (900 to 1600 Pa·S)	
	Class C	1500 to 4000 poises (150 to 400 Pa·S)	
3.3.4	Viscosity of Curing Agent	700 to 1600 poises (70 to 160 Pa·S)	4.6.4
3.3.5	Flow (Class B only) (Class B-2: see Notes 1 and 2.)	0.1 to 0.75 inches (2.5 to 19.1 mm)	4.6.5
3.3.6	Application Time, min		4.6.6
	Class A	2500 poises (250 Pa·S), max	
	Class B (Class B-2: see Notes 1 and 2.)	15 grams per minute, min	
	Class C	30 grams per minute, min	

TABLE 1 - Continued

Paragraph	Property	Requirement	Test Procedure (Paragraph)
3.3.7	Assembly Time Class C	0.005 inch (0.12 mm) max	4.6.7
3.3.8	Tack-Free Time (Measured from beginning of mixing), hours, max		4.6.8
	Class A-1/2	10	
	Class A-2	24	
	Class A-4	48	
	Class B-1/4	8	
	Class B-1/2	12	
	Class B-1	16	
	Class B-2	24	
	(Class B-2: see Notes 1 and 2.)		
	Class B-4	36	
	Class B-12	120	
	Class C-2/2	24	
	Class C-8/24	96	
	Class C-12/48	No defined requirement	
	Class C-48/168	No defined requirement	
	Class C-96/336	No defined requirement	
3.3.9	Standard Cure Time (time to reach 30 Durometer A.), hours, max		4.6.9
	Class A-1/2	30	
	Class A-2	72	
	Class A-4	90	
	Class B-1/4	16	
	Class B-1/2	32	
	Class B-1	48	
	Class B-2	72	
	(Class B-2: see Notes 1 and 2.)		
	Class B-4	90	
	Class B-12	240	

TABLE 1 - Continued

Paragraph	Property	Requirement	Test Procedure (Paragraph)
	Class C-2/2	72	
	Class C-8/24	168	
	Class C-12/48	336	
	Class C-48/168	8 weeks	
	Class C-96/336	16 weeks	
3.3.10	Specific Gravity, max	1.65	4.6.10
3.3.11	14-Day Hardness, min	40 Shore A	4.6.11
3.3.12	Hydrolytic Stability	30 Shore A	4.6.12
3.3.13	Shaving and Sanding	No rolling or tearing of the sealant smooth finish	4.6.13
3.3.14	Paintability	No separation from sealant	4.6.14
3.3.15	Weathering	No cracking, chalking, peeling or loss of adhesion	4.6.15
3.3.16	Resistance to Thermal Rupture, max	0.15 inch (3.8 mm) max No blistering or sponging	4.6.16
3.3.17	Weight Loss & Flexibility		4.6.17
	Weight Loss, Max	10%	
	Flexibility	No cracking or checking	
3.3.18	Volume Swell	5 to 15%	4.6.18
3.3.19	Low Temperature Flexibility	No visual evidence of cracking or checking. No loss of adhesion	4.6.19
3.3.20	Tensile Strength and Elongation (Class B and C) min		4.6.20
3.3.20.1	Standard Cure	200 psi (1380 kPa), 200% elongation	
3.3.20.2	12 days at 140 °F (60 °C) in AMS 2629, Type I	200 psi (1380 kPa), 200% elongation	
3.3.20.3	12 days at 140 °F (60 °C), + 60 hours at 160 °F (71 °C), + 6 hours at 180 °F (82 °C) all in AMS 2629, Type I	125 psi (862 kPa), 100% elongation	

TABLE 1 - Continued

Paragraph	Property	Requirement	Test Procedure (Paragraph)
3.3.20.4	12 days at 140 °F (60 °C) + 60 hours at 160 °F (71 °C) + 6 hours at 180 °F (82 °C), all in AMS 2629, Type I, followed by Standard Heat Cycle in Air as in 4.5.3.	125 psi (862 kPa), 25% elongation	
3.3.20.5	Standard Heat Cycle as in 4.5.3	200 psi (1380 kPa), 100% elongation	
3.3.20.6	72 hours at Standard Conditions in AMS 3021	200 psi (1380 kPa), 200% elongation	
3.3.20.7	72 hours at Standard Conditions in AMS 3020	200 psi (1380 kPa), 200% elongation	
3.3.21	Shear Strength (Class C only), min	150 psi (1034 kPa), 100% cohesive failure	4.6.21
3.3.22	Corrosion Test		4.6.22
	Cyclic Loading and Exposure	No visible evidence of corrosion	
	Aluminum/Titanium Couple	No visible evidence of corrosion	
	Aluminum/Cadmium Plated Steel Couple	No visible evidence of corrosion	
	Aluminum/Epoxy Graphite (AS4/3501-6) Composite Couple	No visible evidence of corrosion	
3.3.23	Peel Strength, min	20 lbf/inch (3580 N/m) /100% cohesive failure	4.6.23
3.3.24	Repairability, min /100% cohesive failure	10 lbf/inch (1750 N/m)	4.6.24
3.3.25	Storage Stability		4.6.25
3.3.25.1	Accelerated Storage		
	Viscosity of Base Compound	Same as 3.3.3	
	Flow	Same as 3.3.5	
	Application Time	Same as 3.3.6	
	Assembly Time (Class C only)	Same as 3.3.7	
	Tack Free Time	Same as 3.3.8	

TABLE 1 - Continued

Paragraph	Property	Requirement	Test Procedure (Paragraph)
	Standard Cure Time	Same as 3.3.9	
	Peel Strength (4 Aluminum panels, Sulfuric acid anodized in Accordance with AMS 2471 and Coated with AMS-C-27725, Type II, Class B (See 8.6) 2 panels in AMS 2629 Type I; 2 panels in AMS 2629 Type I / 3% saltwater; all at 140 °F (60 °C) for 7 days	20 lbf/inch (1750 N/m) / 100% cohesive failure	4.6.23
3.3.25.2	Long Term Storage		4.6.26
	Application Time, min	Same as 3.3.6	4.6.6
	Class A	2500 poises (250 Pa·S), max	
	Class B	15 grams per minute, min	
	Class C	30 grams per minute, min	
	Tack-Free Time (Measured from beginning of mixing), hours, max	Same as 3.3.8	4.6.8
	Class A-1/2	10	
	Class A-2	24	
	Class A-4	48	
	Class B-1/4	12	
	Class B-1/2	16	
	Class B-1	24	
	Class B-2	36	
	Class B-4	90	
	Class B-12	120	
	Class C-2/2	24	
	Class C-8/24	96	
	Class C-12/48	No defined requirement	
	Class C-48/168	No defined requirement	
	Class C-96/336	No defined requirement	

TABLE 1 - Continued

Paragraph	Property	Requirement	Test Procedure (Paragraph)
	Standard Cure Time, hours, max, (30 Durometer A, min)	Same as 3.3.9	4.6.9
	Class A-1/2	30	
	Class A-2	72	
	Class A-4	90	
	Class B-1/4	16	
	Class B-1/2	32	
	Class B-1	48	
	Class B-2	72	
	Class B-4	90	
	Class B-12	240	
	Class C-2/2	72	
	Class C-8/24	168	
	Class C-12/48	336	
	Class C-48/168	8 weeks	
	Class C-96/336	16 weeks	

Note 1: Two cartridges of freshly mixed Class B-2 sealing compound shall be held at Standard Conditions to be tested for Application Time, Flow, Tack-Free Time, and Standard Cure Time. These tests shall be run concurrently during the mixing/freezing process.

Note 2: Class B-2 shall be tested using sealing compound which has been freshly mixed, then quick-frozen and thawed in accordance with AS5127/1 (4.4).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

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

- 4.1.1 The manufacturer shall present written proof to the purchaser that all requirements are met prior to requesting qualification approval for any class. This includes assurance that the sealant will cure at standard conditions. Acceptance testing is conducted on sealant cured at 140 °F (60 °C). After the sealing compound has been accepted for qualification, approval will be granted and the sealant will be identified by reference to the manufacturer's code or formula number.
- 4.1.2 Source Inspection (NADCAP): Material procured under this specification shall be third party approved prior to shipment, to ensure that material meets final acceptance tests (4.2.3). 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.
- 4.2 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, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.
- 4.2.1.1 Qualification: All products sold to this specification shall be listed, or approved for listing, on the Qualified Products List, PRI QPL AMS 3265A. The qualified products list shall be in accordance with PD 2000. Class B-2 shall be the first material that is qualified for each supplier of sealing compound (See 8.2). Class B-2 sealing compound shall be tested for, and shall meet all technical requirements of this specification with the exception of requirements unique to other classes of the sealing compound.
- 4.2.1.2 Once qualification for Class B-2 has been obtained, other classes of the sealing compound may be qualified. The formulation for other classes, and for other Class B application times, shall be the same as Class B-2, except for minor variations necessary for conformance to viscosity and application time requirements. All compounds shall meet all technical requirements of this specification. However, other classes of the sealing compound need only to be tested to the initial acceptance tests listed in 4.2.2, plus all peel strength tests listed in Table 7, or as defined by purchaser.

4.2.2 Initial Acceptance Tests: Initial acceptance tests of individual batches shall consist of the following:

Nonvolatile Content	(3.3.1)
Viscosity of Base Compound ¹	(3.3.3)
Viscosity of the Curing Agent ²	(3.3.4)
Flow	(3.3.5)
Application Time	(3.3.6)
Assembly Time (Class C only)	(3.3.7)
Tack-Free Time	(3.3.8)
Standard Cure Time	(3.3.9)
14-Day Hardness	(3.3.11)
Shear Strength (Class C only)	(3.3.21)
Peel Strength (2 aluminum panels, AMS 4045, sulfuric acid anodized in accordance with AMS 2471 and coated with AMS-C-27725 Type II Class B only (see 8.6) (7 day immersion only).	(3.3.23)

4.2.3 Final Acceptance Tests: Acceptance tests of the final packaged product shall consist of the following:

Air Content	(3.3.2)
Application Time	(3.3.6)
Tack-Free Time	(3.3.8)
Standard Cure Time	(3.3.9)

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.

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 of Viscosity of Curing Agent need not be performed in sectionalized containers of small size, less than 8-ounces (235-ml).

2. See Footnote 1.

- 4.3.1.2 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 4.2.2. 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 consist of those tests outlined in 4.2.3.
- 4.3.1.3 If the batch is being packaged in different types and/or size containers, the final acceptance tests shall be conducted on each type and/or each size containers. If the sealing compound is being procured under different purchase orders, but the purchase orders call for the same type and size containers, it is only necessary to conduct the final acceptance tests one time.
- 4.3.1.4 Plastic Injection Kits: If material is being procured in plastic injection kits, such as those conforming to MIL-P-38714, all tests shall be conducted on material that has been packaged and mixed in the initial sample injection kits except for Viscosity of Base Compound. During filling of initial sample kits, base compound and curing agent shall be placed in 1-quart (1-L) cans for the viscosity tests. If more than one size of injection kits is to be packaged from a particular batch, it is necessary to test material from only one size kit.
- 4.3.1.5 Cans, Pails, and Drums: If the material is being procured in cans, pails, or drums, the batch shall be tested on material placed in 1-quart (1-L) cans.
- 4.3.1.6 Both Type Containers: If the material is being procured in both plastic injection kit form, as well as cans, pails, or drums, as containers, the initial acceptance tests shall be conducted on material packaged in plastic injection kits.
- 4.3.2 Statistical Sampling Plan: When a statistical sampling plan has been agreed upon by the purchaser and supplier, sampling shall be in accordance with such plan 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 sealing compound 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, not less than three. Multiple testing is not required for viscosity, application time, flow, tack-free time and hardness.

- 4.3.4 Qualification Test Samples: Samples should consist of one five-gallon (19-L) pail of base compound with one 1-gallon (4-L) pail of curing compound, two 1-quart (1-L) kits of sealing compound, three 1-pint (1/2-L) kits of sealing compound, one 1-quart (1-L) container of curing agent, and two 1-pint (1/2-L) containers of adhesion promoter.

Samples shall be identified as specified herein and below:

SEALING COMPOUND, POLYSULFIDE (T) RUBBER, NONCHROMATED, CORROSION INHIBITING FOR INTERMITTENT USE TO 360 °F (182 °C)

SEALANT DESIGNATION, CLASS AND DASH NUMBER

MANUFACTURER'S IDENTIFICATION _____

BATCH/LOT NUMBER _____

DATE OF PACKAGING _____

SHELF LIFE EXPIRATION DATE _____

STORE BELOW 80 °F (27 °C)

Submitted by (Name) (Date) for qualification tests in accordance with AMS 3265A

Class _____

- 4.3.5 Shelf Life Surveillance and Updating:

- 4.3.5.1 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

- 4.3.6 Shelf Life:

- 4.3.6.1 Date of Packaging: Date of Packaging is defined as the date finished material is assembled from its components, base compound and curing agent, into a package and labeled kit or unit by the manufacturer or re-packager. Date of Packaging shall be no more than 90 days from the last day of acceptance testing in accordance with 4.2.2. Material may be retested by the manufacturer at any time to determine conformance by testing in accordance with 4.2.2.
- 4.3.6.2 Premixed and Frozen Material: Premixed and frozen material shall have a minimum storage life of 30 days at -40 °F (-40 °C) or lower, or 10 days at -10 to -40 °F (-23 to -40 °C) from date of mix/freeze. The date of mix/freeze shall be within the shelf life of the unmixed material.

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

Condition of Container	
Viscosity of Base Compound (Not possible with sectional-type containers)	(3.3.3)
Viscosity of Curing Agent	(3.3.4)
Application Time	(3.3.6)
Tack-Free Time	(3.3.8)
Standard Cure Time	(3.3.9)
Peel Strength: two aluminum panels, sulfuric acid anodized per AMS 2471, coated with AMS-C-27725 Type II Class B corrosion preventive coating (see 8.6), and aged in AMS 2629, Type I for 7 days at 140 °F (60 °C).	(3.3.23)

4.3.7.1 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 AMS 3265A.

4.4.2 Manufacturer shall use ingredients, manufacturing procedures, processes, and methods of inspection on production product, which 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 4.5.5. 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:

4 hours at 260 °F (127 °C), plus
40 minutes at 320 °F (160 °C), plus
1 hour at 360 °F (182 °C).

4.5.4 Preparation of Test Specimens: Test specimens shall be prepared in accordance with AS5127 (6). Peel strength panels shall be configured in accordance with AS5127/1 Figure 22.

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.

TABLE 3 - Cleaning of Test Panels

Panel Material	Cleaning Method, AS5127 (paragraph)
Aluminum alloy, chemical conversion coating test surface	(6.1) "Chemical Conversion Coating Application", including subparagraphs: (6.1.1) "Preparation of Aluminum Panel Test Surfaces" (6.1.2) "Chemical Conversion Coating" (6.1.2.1) "Panel Preparation" (6.1.2.2) "Coating Application (Immersion)"
Aluminum alloy, sulfuric acid anodized	(6.1.1) "Preparation of Aluminum Panel Test Surfaces"
AMS 5516 Stainless steel	(6.3) "Preparation of AMS 5516 Stainless Steel Panel Test Surfaces"
AMS 4901 Titanium alloy	(6.4) "Preparation of AMS 4901 Titanium Panel Test Surfaces"
Aluminum alloy, MIL-PRF-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"
Aluminum alloy, MIL-PRF-23377 test surface	(6.2.2) "Cleaning of MIL-P-23377 Surface for Sealing"

4.5.4.2 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 Figure 22 "Five-Inch Peel Specimen Configuration".

Class A: Peel strength test panels shall be prepared in accordance with AS5127/1 (8.1.2).

Class B: Peel strength test panels shall be prepared in accordance with AS5127/1 (8.1.1).

Class C: Peel strength test panels shall be prepared in accordance with AS5127/1 (8.1.2).

4.5.5 Curing of Sealing Compounds: For Qualification testing, the sealing compound shall be cured at for 14 days at Standard Conditions. For Acceptance testing, Classes A and B sealing compounds shall be given an accelerated cure for 48 hours at Standard Conditions followed by 24 hours at 140 °F (60 °C). Class C sealing compound, accelerated cure shall be 48 hours at Standard Conditions, followed by the number of hours listed in Table 4 below at 140 °F (60 °C) according to the sealing compound designation.

TABLE 4 - Class C Accelerated Cure Times

Sealing Compound	Hours at 140 °F (60 °C)
Class C-2/2	24
Class C-8/24	24
Class C-12/24	24
Class C-48/168	No Defined Requirement
Class C-96/336	No Defined Requirement

4.5.6 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.

4.5.7 Future revisions of AS5127 and AS5127/1: Use of a specific issue of AS5127 and of AS5127 is for clarity. Future revisions of AS5127 and AS5127/1, when published, may be used providing test methods correspond in kind to those of the issues listed in 2.1.

4.5.8 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", (4.3) "Quick-Freezing of Sealing Compound", and (4.4) "Thawing of Quick-Frozen Sealing Compound".

4.5.9 Application of Adhesion Promoter: AMS 4901, AMS 5516, AMS-C-27725 and MIL-PRF-85582 panels shall be treated with AMS 3100 adhesion promoter in accordance with AS5127 under (6.7) "Application of Adhesion Promoter".

- 4.5.10 Application of Sealing Compound: Unless otherwise specified herein or as provided in AS5127 under (6.8) "Application of Sealing Compound", test panels shall be given an application of sealing compound to produce a coating having a total thickness of 1/8 inch \pm 1/64 (3.2 mm \pm 0.4) when cured. For Class A material, a time equal to the application life shall be used between the three applications to permit release of solvents.
- 4.5.11 Cure of Sealing Compound: For qualification testing, the sealing compound shall be cured for 14 days at 77 °F (25 °C) and 50% \pm 5 relative humidity. For acceptance tests, the sealing compound shall be given an accelerated cure according to 4.5.5. Tests on the cured sealing compound shall commence not more than two days after completion of the specified cure. See AS5127 (6.9) "Curing of Sealing Compounds".
- 4.6 Test Procedures:
- 4.6.1 Nonvolatile Content: See AS5127/1 (5.1).
- 4.6.2 Air Content: See AS5127/1 (5.2).
- 4.6.3 Viscosity of Base Compound: See AS5127/1 (5.3).
- 4.6.4 Viscosity of Curing Agent: See AS5127/1 (5.4).
- 4.6.5 Flow (Class B only): See AS5127/1 (5.5.1).
- 4.6.6 Application Time: See AS5127/1 (5.6).
- 4.6.7 Assembly Time: See AS5127/1 (5.7).
- 4.6.8 Tack-Free Time: See AS5127/1 (5.8).
- 4.6.9 Standard Cure Time: See AS5127/1 (5.9).
- 4.6.10 Specific Gravity: See AS5127/1 (6.1).
- 4.6.11 14-Day Hardness: See AS5127/1 (6.2).
- 4.6.12 Hydrolytic Stability: See AS5127/1 (6.6).
- 4.6.13 Shaving and Sanding: See AS5127/1 (6.7).
- 4.6.14 Paintability: See AS5127/1 (6.8).
- 4.6.15 Weathering: See AS5127/1 (6.9).

4.6.16 Resistance to Thermal Rupture:

4.6.16.1 Resistance to Thermal Rupture shall be conducted in accordance with AS5127/1 (7.2). The air circulating oven shall be preset at 300 °F (182 °C) and the clamp fixture shall be placed in the oven at 10 +1/-0 psi (69 +6.9/-0 kPa) for 30 minutes.

4.6.17 Weight Loss and Flexibility: See AS5127/1 (7.4).

4.6.18 Volume Swell: See AS5127/1 (7.5).

4.6.19 Low Temperature Flexibility: See AS5127/1 (7.6).

4.6.20 Tensile Strength and Elongation: See AS5127/1 (7.7).

4.6.21 Shear Strength (Class C only): See AS5127/1 (7.8)

4.6.22 Corrosion Test: See AS5127/1 (7.10).

4.6.22.1 Cyclic Loading and Exposure Test: Corrosion testing shall consist of stressed aluminum assemblies and mixed metal panels undergoing exposure to a corrosive environment. Test shall be conducted in accordance with AS5127/1 under (7.10) "Corrosion Stressed Assembly and Mixed Metals", with the following exceptions:

4.6.22.2 Preparation of Test Assembly: Test assemblies shall be in accordance with AMS 3265A, Table 5 and with AS5127/1 under (7.10) "Corrosion Stressed Assemblies and Mixed Metals".

TABLE 5 - Preparation Sequence of Corrosion Test Assemblies (See Note 1)

Sequence Step	Assembly Preparation
	Two assemblies shall be prepared as follows:
1	Approximately 0.005-inch (0.13-mm) sealing compound shall be applied to one side of each panel by spatula. After one to two hours, the coated sides of the panels shall be mated.
2	Threaded fasteners, shown in AS5127/1 (Figure 17), shall be installed wet with sealing compound, then inserted into the freshly mated panels and torqued to 40 inch pounds (4.6 N·m).
3	Sealing compound shall be applied by gun to the butt joint. Using a spatula, cover over and around the fastener head, backs (nuts) and all edges.
4	Brush sealing compound over the entire assembly to a thickness of 0.005 to 0.007 inches (0.13 to 0.18 mm).
5	Cure the assembly in accordance with AS5127 (6.9).
6	After curing, scribe one half of the front side of each assembly as shown in Figure 18 of AS5127/1 "Mixed Metal Assemblies"

4.6.22.3 Mixed Couple: All sealant types shall be subjected to mixed couple corrosion testing. Two test panels of each type assembled, as indicated in AMS 3265A, Table 6, cleaned in accordance with 4.5.4.1, and configured as shown in AS5127/1, Figure 18 shall be used for each sealant.

TABLE 6 - Mixed Couple Assemblies

Assembly	Metal B (Figure 18 AS5127/1)	Metal A (Figure 18 AS5127/1)
1	Aluminum 1/	Titanium 2/
2	Aluminum 1/	Aluminum 3/
3	Aluminum 1/	Epoxy/Graphite 4/

1/ AMS 4045 treated with MIL-C-81706, Class 1A, materials
 2/ MIL-T-9046, Type III, Composite C (6Al – 4V)
 3/ AMS 4049
 4/ AS4/3501-6

4.6.23 Peel Strength:

4.6.23.1 The type and quantity of panels listed in AMS 3265A, Table 7 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 7. The panels shall be prepared in accordance with AS5127/1 (6.7). Sealing compound shall cover 5 inches (127 mm) of one side of the panel surface in accordance with AS5127/1 (Figure 22). When specified, AMS 3100 adhesion promoter shall be applied per 4.5.9.

4.6.23.2 The sealing compound shall be cured in accordance with 4.5.11. At the end of the cure, panels of each substrate shall be subjected to the immersion media listed in Table 7.

4.6.23.3 Fuel Cycle: One fuel cycle shall be 100 hours at 140 °F (60 °C) in AMS 2629 Type I / 3% saltwater, plus 10 hours at 160 °F (71 °C), plus 1 hour at 180 °F (82 °C) in AMS 2629 Type I / 3% saltwater. The test fluid shall be changed after each fuel cycle.

4.6.23.4 Acceptance Tests (only): Prepare four AMS 4045 aluminum alloy panels measuring 0.040 x 275 x 6 inches (1.02 x 69.8 x 152 mm) sulfuric acid anodized in accordance with AMS 2471 and coated with AMS-C-27725, Type II, Class B.

TABLE 7 - 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 AMS 4049, chemical conversion coating per MIL-C-81706, Class 1A, Form II, Method C (See Note 1)	2 panels in AMS 2629 Type I for 7 days 2 panels in AMS 2629 Type I / 3% saltwater for 7 days 2 panels in AMS 2629 Type I / 3% saltwater (See 4.6.23.3)
6	0.040 (1.02)	Al alloy AMS 4045 sulfuric acid anodized per AMS 2471	2 panels in AMS 2629 Type I for 7 days 2 panels in AMS 2629 Type I / 3% saltwater for 7 days 2 panels in AMS 2629 Type I / 3% saltwater (See 4.6.23.3)
6	0.025 to 0.040 (0.64 to 1.02)	Stainless steel AMS 5516 (Use AMS 3100 Adhesion Promoter)	2 panels in AMS 2629 Type I for 7 days 2 panels in AMS 2629 Type I / 3% saltwater for 7 days 2 panels in AMS 2629 Type I / 3% saltwater (See 4.6.23.3)
10	0.025 to 0.040 (0.64 to 1.02)	Titanium AMS 4901 (Use AMS 3100 Adhesion Promoter)	2 panels in AMS 2629 Type I for 7 days 2 panels in AMS 2629 Type I / 3% saltwater for 7 days 2 panels in AMS 2629 Type I for 70 days 2 panels in AMS 2629 Type I / 3% saltwater for 70 days 2 panels in AMS 2629 Type I / 3% saltwater (See 4.6.23.3)
10	0.040 (1.02)	Al alloy AMS 4045 sulfuric acid anodized per AMS 2471, coated with AMS-C-27725 Type II Class B (see 8.6).	2 panels in AMS 2629 Type I for 7 days 2 panels in AMS 2629 Type I / 3% saltwater for 7 days 2 panels in AMS 2629 Type I for 70 days 2 panels in AMS 2629 Type I / 3% saltwater for 70 days 2 panels in AMS 2629 Type I / 3% saltwater (See 4.6.23.3)
6	0.040 (1.02)	Al alloy AMS 4045 sulfuric acid anodized per AMS 2471, coated with AMS-C-27725 Type II Class B (see 8.6). (Use AMS 3100 Adhesion Promoter).	2 panels in AMS 2629 Type I for 7 days 2 panels in AMS 2629 Type I / 3% saltwater for 7 days 2 panels in AMS 2629 Type I / 3% saltwater (See 4.6.23.3)
2	0.040 (1.02)	Al alloy AMS 4045 sulfuric acid anodized per AMS 2471, coated with MIL-PRF-23377, and cured 7 days at standard conditions	2 panels in 3% saltwater for 7 days