

AEROSPACE MATERIAL SPECIFICATION



AMS 3276D

Issued OCT 1993
Revised JAN 2003

Superseding AMS 3276C

(R)

Sealing Compound, Integral Fuel Tanks and General Purpose,
Intermittent Use to 360 °F (182 °C)

1. SCOPE:

1.1 Form:

This specification covers five classes of a fuel-resistant polysulfide (T) sealing compound supplied as a two-component system.

1.2 Application:

This sealing compound has been used typically for fuel tank sealing, cabin pressure sealing, and aerodynamic smoothing, but usage is not limited to such applications. It can be used for faying surface sealing, wet-installation of fasteners, overcoating fasteners, sealing joints and seams, and nonstructural adhesive bonding. This room-temperature curing sealing compound can be used in fuel areas as well as nonfuel areas. Curing of this material can be accelerated at higher temperatures. This material is usable from -65 to 250 °F (-54 to 121 °C), with short-term exposure (approximately six hours) to 360 °F (182 °C).

1.2.1 Notation: AMS 3100 adhesion promoter should be applied prior to the sealant.

1.3 Classification:

Sealing compounds covered by this specification are classified as follows:

Class A – Suitable for application by brush. Available with the following application times in hours:

A-1/2
A-2
A-4

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright 2003 Society of Automotive Engineers, Inc.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

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

1.3 (Continued):

Class B – Suitable for application by extrusion gun or spatula. Used primarily for fillet sealing, injection sealing, prepack sealing, and rework of damaged fillet seals. Available with the following application times in hours:

B-1/4
B-1/2
B-1
B-2
B-4
B-6
B-12

Class C - Suitable for application by brush, extrusion gun, roller or spatula. Used mostly for fay surface sealing and wet installation of fasteners. Available with the following application times in hours:

Notation: () Assembly time in hours, where indicated.

C-1/2
C-2
C-8(20)

Class D - Suitable for application by extrusion gun or spatula. Used for hole and void filling, or for other applications where a very thick sealant is required. Available with the following application times in hours:

D-1/4
D-1/2

Class E - Suitable for application by automatic riveting equipment. Available with the following application time in hours:

E-6

1.4 Precautions:

1.4.1 Safety – Hazardous Materials: Shall be in accordance with AS5502 (1.1)

2. APPLICABLE DOCUMENTS:

Shall be in accordance with AS5502 (2.)

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001 or www.sae.org.

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 4045	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
AMS 4049	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
AMS 4911	Titanium Sheet, Strip and Plate, 6Al, 4V Annealed
AMS 5516	Steel, Corrosion Resistant, Sheet, Strip, and Plate, 18Cr - 9.0Ni (SAE 30302) Solution Heat Treated
AMS-C-27725	Coating, Corrosion Preventive, for Aircraft Integral Fuel Tanks
AS5127	Methods for Testing Aerospace Sealants
AS5127/1	Methods for Testing Aerospace Sealants, Two-Component Synthetic Rubber Compounds
AS5502	Standard Requirements for Aerospace Sealants

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094 or www.dsp.dla.mil.

MIL-PRF-23377	Primer Coatings: Epoxy Polyamide, Chemical and Solvent Resistant
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

2.3 PRI Publications:

Available from PRI, 161 Thornhill Road, Warrendale, PA 15086-7527 or www.pri.sae.org.

PD 2000	Procedures for an Industry Qualified Product Management Process
PRI-QPL-AMS	3276 Products Qualified Under AMS 3276

2.4 Definitions:

See AS5502 (2.3)

3. TECHNICAL REQUIREMENTS:

3.1 Materials:

The basic ingredient shall be synthetic rubber of the polysulfide (T) type. The sealing compound shall cure by addition of a curing agent to the base compound; the curing agent is also called a catalyst or accelerator. Curing of the sealing compound shall not depend on solvent evaporation for curing. The material shall contain no lead compounds. The curing agent shall possess sufficient color contrast to base compounds 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.

- 3.1.1 Qualification: All products sold to this specification shall be listed, or approved for listing, on the qualified products list, PRI-QPL-AMS3276. The qualified products list shall be in accordance with PD 2000.

3.2 Date of Packaging:

Shall be in accordance with AS5502 (3.1).

3.3 Toxicological Formulations:

Shall be in accordance with AS5502 (3.2).

3.4 Quality:

Shall be in accordance with AS5502 (3.3).

3.5 Shelf Life:

Shelf life shall be a minimum of 9 months from the date of packaging. Material may be retested for shelf life extension.

- 3.5.1 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.

3.6 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 Procedures (Paragraph)
3.6.1	Nonvolatile Content, by weight, min		AS5127/1 (5.1)
	Class A	85%	
	Class B	96%	
	Class C	92%	
	Class D	97%	
	Class E	85%	
3.6.2	Air Content, max (Class B only)	4%	AS5127/1 (5.2)
3.6.3	Viscosity of Base Compound		AS5127/1 (5.3)
	Class A (Use No. 6 spindle @ 10 rpm)	100 to 600 poises (10 to 60 Pa•S)	
	Class B (Use No. 7 spindle @ 2rpm)	9000 to 16000 poises (900 to 1600 Pa•S)	
	Class C (Use No. 6 spindle @ 2 rpm)	1000 to 4000 poises (100 to 400 Pa•S)	
	Class D (Use No. 7 spindle @ 2 rpm)	20,000 to 30,000 poises (2000 to 3000 Pa•S)	
	Class E (Use No. 7 spindle @ 10 rpm)	300 to 800 poises (30 to 80 Pa•S)	
3.6.4	Viscosity of Curing Agent (Use No. 7 spindle @ 10 rpm)	700 to 2500 poises (70 to 250 Pa•S)	AS5127/1 (5.4)
3.6.5	Flow		AS5127/1 (5.5)
	Class B (Class B-2: see Notes 1 and 2.)	0.1 to 0.75 inches (2.5 to 19.0 mm)	AS5127/1 (5.5.1)
	Class C	0.010 inch (0.25 mm), min	AS5127/1 (5.5.2)
	Class D	0.20 inch (5.1 mm), min	AS5127/1 (5.5.1)

TABLE 1 – Properties (Continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.6	Application Time, min		AS5127/1 (5.6)
	Class A – From the beginning of mixing, the viscosity shall not exceed 2500 poise (250 Pa•S), (Use No. 7 spindle @ 10 rpm)		AS5127/1 (5.6.1)
	Class A-1/2	1/2 hour	
	Class A-2	2 hours	
	Class A-4	4 hours	
	Class B – From the beginning of mixing, not less than 15 grams per minute shall be extruded.		AS5127/1 (5.6.2)
	Class B-1/4	1/4 hour	
	Class B-1/2	1/2 hour	
	Class B-1	1 hour	
	Class B-2 (see Notes 1 and 2)	2 hours	
	Class B-4	4 hours	
	Class B-6	6 hours	
	Class B-12	12 hours	
	Class C – From the beginning of mixing, not less than 30 grams per minute shall be extruded.		AS5127/1 (5.6.2)
	Class C-1/2	1/2 hours	
	Class C-2	2 hours	
	Class C-8(20)	8 hours	
	Class D – From the beginning of mixing, not less than 15 grams per minute shall be extruded.		AS5127/1 (5.6.2)
	Class D-1/4	1/4 hour	
	Class D-1/2	1/2 hour	
	Class E – From the beginning of mixing, the viscosity shall be between 800 to 1100 poise (80 to 110 Pa•S), (Use No. 7 spindle @ 10 rpm)		AS5127/1 (5.6.1)
	Class E-6	6 hours	

TABLE 1 – Properties (Continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.7	Assembly Time (Class C only) Class C-8(20)	20 hours	AS5127/1 (5.7)
3.6.8	Tack-Free Time (Measured from beginning of mixing), hours, max		AS5127/1 (5.8)
	Class A-1/2	10	
	Class A-2	24	
	Class A-4	36	
	Class B-1/4	6	
	Class B-1/2	10	
	Class B-1	12	
	Class B-2 (See Notes 1 and 2)	24	
	Class B-4	36	
	Class B-6	48	
	Class B-12	120	
	Class C-1/2	10	
	Class C-2	24	
	Class C-8(20)	96	
	Class D-1/4	6	
	Class D-1/2	10	
	Class E-6	120	
3.6.9	Standard Cure Time (time to reach 35 Durometer A), hours, max		AS5127/1 (5.9)
	Class A-1/2	30	
	Class A-2	72	
	Class A-4	90	
	Class B-1/4	16	
	Class B-1/2	30	
	Class B-1	36	
	Class B-2 (See Notes 1 and 2.)	72	
	Class B-4	90	
	Class B-6	120	
	Class B-12	240	
	Class C-1/2	30	
	Class C-2	72	
	Class C-8(20)	336	
	Class D-1/4	16	
	Class D-1/2	30	
	Class E-6	240	

TABLE 1 – Properties (Continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.10	Fluid Immersion Cure Time, min (Classes A-1/2, B-1/4, B-1/2 only) After 48 hours After 120 hours	25 Shore A 35 Shore A	AS5127/1 (5.11)
3.6.11	Specific Gravity, max average	1.65	AS5127/1 (6.1)
3.6.12	14-Day Hardness, min (Note 3)	40 Durometer A	AS5127/1 (6.2)
3.6.13	Radiographic Density		AS5127/1 (6.3)
	Difference between plate and plate plus sealant, max	1.00	
	Through sealant in the slot, approximately	3.00	
3.6.14	Resistance to Thermal Expansion	Sealant flush with groove within +0.010 and -0.003 inch (+0.25 and -0.08 mm) at the wide end of the test block and within +0.005 and -0.003 inch (+0.13 and -0.08 mm) at the narrow end.	AS5127/1 (6.4)
3.6.15	Heat Reversion Resistance (Classes B, C and E only)	The sealant shall not revert to a liquid or paste- like consistency, nor shall it become brittle or lose adhesion.	AS5127/1 (6.5)
3.6.16	Hydrolytic Stability	30 Durometer A	AS5127/1 (6.6)
3.6.17	Shaving and Sanding (Class B only)	No rolling or tearing of the sealant, smooth finish	AS5127/1 (6.7)
3.6.18	Paintability	No separation from sealant	AS5127/1 (6.8)

TABLE 1 – Properties (Continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.19	Weathering	No cracking, chalking, peeling or loss of adhesion	AS5127/1 (6.9)
3.6.20	Chalking	Slight	AS5127/1 (7.1)
3.6.21	Resistance to Thermal Rupture, max (Class A and B only), Oven air aging at 300 °F (149 °C), 10 psi (69 kPa), 30 minutes	0.156 inch (3.96 mm) No blistering or sponging	AMS 3276 (4.6.1) and AS5127/1 (7.2)
3.6.22	Weight Loss & Flexibility Weight Loss, Max Flexibility	8% No cracking or checking	AS5127/1 (7.4)
3.6.23	Volume Swell	5 to 15%	AS5127/1 (7.5)
3.6.24	Low Temperature Flexibility	No visual evidence of cracking or checking. No loss of adhesion	AMS 3276 (4.6.2) and AS5127/1 (7.6)
3.6.25	Tensile Strength and Elongation, min (Classes B, C-1/2, C-2, C-6, D-1/4, and D-1/2)		AS5127/1 (7.7)
3.6.25.1	Standard Cure	250 psi (1724 kPa), 250% elongation	
3.6.25.2	Standard Cure + 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 – Properties (Continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.25.3	Standard Cure + 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, + 24 hours at 120 °F (49 °C), followed by Standard Heat Cycle in Air as in 4.5.3	125 psi (862 kPa), 25% elongation	
3.6.25.4	Standard Cure + Standard Heat Cycle as in 4.5.3	100 psi (689 kPa), 25% elongation	
3.6.25.5	Standard Cure + 2 hours at Standard Conditions in AMS 3021	125 psi (862 kPa), 100% elongation	
3.6.25.6	Standard Cure + 72 hours at Standard Conditions in AMS 3020	125 psi (862 kPa), 100% elongation	
3.6.26	Shear Strength, min (Classes C and E only)	200 psi (1379 kPa), 100% cohesive failure	AS5127/1 (7.8)
3.6.27	Corrosion Resistance	No corrosion under sealant or signs of deterioration	AS5127/1 (7.9)
3.6.28	Peel Strength, min (All Classes except C-8(20))	20 lbf/inch (3503 N/m) /100% cohesive failure	AMS 3276 (4.6.4)
3.6.28.1	Peel Strength for Repair Material, min	10 lbf/inch (1751 N/m) /100% cohesive failure	AMS 3276 (4.6.4.4)
3.6.29	Repairability, min	5 lbf/inch (876 N/m) /100% cohesive failure	AMS 3276 (4.6.5)

TABLE 1 – Properties (Continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.30	Storage Stability		
3.6.30.1	Accelerated Storage		AS5127/1 (9.1)
	Viscosity of Base Compound	Same as 3.6.3	
	Viscosity of Curing Agent	Same as 3.6.4	
	Flow	Same as 3.6.5	
	Application Time	Same as 3.6.6	
	Assembly Time	Same as 3.6.7	
	Tack Free Time	Same as 3.6.8	
	Peel Strength:	20 lbf/inch (3503 N/m)	AS5127/1 (8.1)
	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	100% cohesive failure	
3.6.30.2	Long Term Storage		AS5127/1 (9.2)
	Application Time	Same as 3.6.6	
	Tack-Free Time, hours, max		
	Class A-1/2	20	
	Class A-2	48	
	Class A-4	72	
	Class B-1/4	16	
	Class B-1/2	20	
	Class B-1	24	
	Class B-2	48	
	Class B-4	72	
	Class B-6	96	
	Class B-12	180	
	Class C-1/2	20	
	Class C-2	48	
	Class C-8(20)	144	
	Class D-1/4	16	
	Class D-1/2	20	
	Class E-6	180	

TABLE 1 – Properties (Continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
	Standard Cure Time, hours, max		
	Class A-1/2	40	
	Class A-2	72	
	Class A-4	114	
	Class B-1/4	24	
	Class B-1/2	40	
	Class B-1	54	
	Class B-2	72	
	Class B-4	114	
	Class B-6	144	
	Class B-12	264	
	Class C-1/2	40	
	Class C-2	72	
	Class C-8(20)	360	
	Class D-1/4	24	
	Class D-1/2	40	
	Class E-6	144	
Note 1: Two cartridges of freshly mixed Class B-2 sealing compound shall be held at Standard Conditions to be tested for Flow, Application Time, 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). Note 3: Does not apply for longer work life sealants including Classes B-12; C- 8 (20)			

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

Shall be in accordance with AS5502 (4.1).

4.1.1 Source Inspection: Shall be in accordance with AS5502 (4.1.1).

4.1.2 Sampling: Shall be in accordance with AS5502 (4.1.2).

4.2 Classification of Tests:

Shall be in accordance with AS5502 (4.2).

- 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 lot of the sealing compound prior to shipment to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4, 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-AMS3276. The qualified products list shall be in accordance with PD 2000: See AS5502 (2.1). Class B-2 shall be the first material that is qualified for each supplier of sealing compound in accordance with (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 5, or as defined by purchaser or QPL agency.
- 4.2.2 Initial Acceptance Tests: Requirements shown in Table 2 are initial acceptance tests and shall be performed on each batch.
- 4.2.3 Final Acceptance Tests: Requirements shown in Table 3 are final acceptance tests and shall be performed on each lot. Acceptance tests of the final packaged product shall consist of the following:
- 4.3 Sampling and Testing:
- Shall be in accordance with AS5502 (4.3)
- 4.3.1 Acceptance Tests: Shall be in accordance with AS5502 (4.3.1)
- 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.

TABLE 2 - Acceptance Tests

Test	Requirement Paragraph
Nonvolatile Content	3.6.1
Viscosity of the Base Compound <u>1/</u>	3.6.3
Viscosity of the Curing Agent <u>1/</u>	3.6.4
Flow (Class B only)	3.6.5
Application Time	3.6.6
Assembly Time (C-4(4) only)	3.6.7
Tack-Free Time	3.6.8
Standard Cure Time	3.6.9
14-Day Hardness	3.6.11
Shear Strength (Class C only)	3.6.21
Peel Strength	3.6.28

1/ Testing need not be performed on material packaged in sectionalized containers or small size containers less than eight ounces (235 mL).

TABLE 3 - Final Acceptance Tests

Test	Requirement Paragraph
Air Content	3.6.2
Application Time	3.6.6
Tack-Free Time	3.6.8
Standard Cure Time	3.6.9

- 4.3.1.2 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: Shall be in accordance with AS5502 (4.3.1.3)

4.3.1.5 Cans, Pails, and Drums: Shall be in accordance with AS5502 (4.3.1.4)

4.3.1.6 Both Type Containers: Shall be in accordance with AS5502 (4.3.1.5)

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 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 agent, 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, INTEGRAL FUEL TANKS AND GENERAL PURPOSE,
INTERMITTENT USE TO 360 °F (182 °C)

AMS 3276D Class

MANUFACTURER'S IDENTIFICATION _____

BATCH/LOT NUMBER _____

DATE OF PACKAGING _____

SHELF LIFE EXPIRATION DATE _____

STORE BELOW 80 °F (27 °C)

4.3.4 Shelf Life Surveillance and Updating:

4.3.4.1 Sampling: Shall be in accordance with AS5502 (4.1.2)

4.3.4.2 Shelf-Life Testing: The inspections to be conducted for shelf-life surveillance and updating are listed in Table 4.

TABLE 4 – Shelf-Life Testing

Test	Requirement Paragraph
Appearance	3.4
Viscosity of Base Compound <u>1/</u>	3.6.3
Viscosity of Curing Agent <u>1/</u>	3.6.4
Application Time	3.6.6
Tack-Free Time	3.6.8
Standard Cure Time	3.6.9
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).	3.6.28
<u>1/</u> Not possible with sectional-type containers.	

4.3.4.3 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:

Shall be in accordance with AS5502 (4.4).

4.4.1 Purchaser Approval: Shall be in accordance with AS5502 (4.4.1).

4.4.2 Methods of Inspection: Shall be in accordance with AS5502 (4.4.2).

4.5 Test Methods:

4.5.1 Standard Tolerances: Unless otherwise specified herein, standard tolerances of AS5127 (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 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 conditions in accordance with AS5127 (4).

- 4.5.3 Standard Heat Cycle: When directed herein, the Standard Heat Cycle to which sealants shall be exposed shall be performed six times:

Standard Heat Cycle:

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).

- 4.5.4.1 Cleaning of Test Panels: Test panels shall be cleaned in with AS5127 (6).

- 4.5.4.2 Preparation of Peel Strength Test Panels: Test panel configuration shall be in accordance with AS5127/1 (8.) "Peel Strength Properties" and (8.1) "Peel Strength Testing" and as in Figure 22 "Five-Inch Peel Specimen Configuration".

- 4.5.5 Preparation of Sealing Compound: Sealing compound shall be prepared in accordance with AS5127/1 (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".

- 4.5.6 Application of Adhesion Promoter: AMS 4911, AMS 5516, AMS-C-27725, MIL-PRF-85285 and MIL-PRF-85582 panels shall be treated with AMS 3100 adhesion promoter in accordance with AS5127 (6.7) "Application of Adhesion Promoter".

- 4.5.7 Application of Sealing Compound: Unless otherwise specified herein, freshly mixed sealing compound shall be applied to test panels in accordance with AS5127 (6.8) "Application of Sealing Compound". For Class A material, a time equal to the application life shall be used between the three applications to permit release of solvents.

- 4.5.8 Curing of Sealing Compounds: Shall be in accordance with AS5127 (6.9) "Curing of Sealing Compounds." For Qualification testing, Classes A and B sealing compounds shall be cured for 14 days at Standard Conditions. For Acceptance testing, Classes A and B sealing compounds may be given an accelerated cure for 48 hours at Standard Conditions followed by 24 hours at 140 °F (60 °C). For Qualification testing and Acceptance testing of Class C sealing compounds, accelerated cure shall be 48 hours at Standard Conditions, followed by 24 hours at 140 °F (60 °C).

- 4.6 Test Procedures:

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

4.6.1 Resistance to Thermal Rupture:

4.6.1.1 Resistance to Thermal Rupture shall be conducted in accordance with AS5127/1 (7.2). The air circulating oven shall be preset at 250 °F (121 °C) and the clamp fixture shall be placed in the oven at 10 psi +1, -0 (69 kPa +6.9, -0) for 30 minutes.

4.6.2 Low Temperature Flexibility: Low temperature flexibility shall be conducted in accordance with AS5127/1 (7.6). At the end of the standard cure in accordance with 4.5.8, two panels shall be immersed in AMS 2629, Type I for 120 hours at 140 °F (60 °C) followed by 60 hours at 160 °F (70 °C) and 6 hours at 180 °F (80 °C). At the completion of the fluid exposure, the specimens shall be removed from the fluid. All four specimens shall be exposed to the standard heat cycle as in 4.5.3, after which all four panels shall be immediately placed in a low temperature flexibility fixture and tested in accordance with AS5127/1 (7.6).

4.6.4 Peel Strength:

4.6.4.1 The type and quantity of panels listed in AMS 3276, Table 5 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 5. 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, AMS 3100 adhesion promoter shall be applied per 4.5.6.

4.6.4.2 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 8.

4.6.4.3 Fuel/Saltwater Heat Cycle: A total of six fuel/saltwater heat cycles shall be performed. One cycle shall consist of 100 hours at 140 °F (60 °C) in AMS 2629 Type I / 3% saltwater, plus 10 hours at 160 °F (71 °C) in AMS 2629 Type I / 3% saltwater, plus 1 hour at 180 °F (82 °C) in AMS 2629 Type I / 3% saltwater. After each cycle, the panels shall be cooled to room temperature and shall be directly transferred to fresh test fluid for each succeeding cycle.

4.6.4.4 Peel Strength for Repair: For Classes A-1/4, A-1/2, B-1/4, and B-1/2, two 0.040 x 2.75 x 6 inch (1.02 x 69.8 x 152 mm) AMS 4045 aluminum alloy panels shall be anodized in accordance with AMS 2471 and coated with AMS-C-27725. Apply sealing compound as in 4.5.7. After curing at standard conditions for one hour, immerse the panels in AMS 2629, Type I JRF at 77 °F (25 °C) for seven days. Test the panels in accordance with AS5127/1 (8.)

4.6.4.5 Acceptance Tests (only): Prepare two AMS 4045 aluminum alloy panels measuring 2.75 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 corrosion preventative coating (see 8.6), and aged in AMS 2629, Type I for 7 days at 140 °F (60 °C).