AEROSPACE MATERIAL SPECIFICATION

AMS-S-8802™	REV. F

Issued 1999-05
Revised 2022-10

Superseding AMS-S-8802E

Sealing Compound, Fuel-Resistant, Integral Fuel Tanks and Fuel Cell Cavities

RATIONALE

Five-Year Review. Changed term “standard cure time” to “cure time to hardness.” Added additional informational clarifications.

1. SCOPE

1.1 Form

This specification covers fuel-resistant, two-component polysulfide synthetic rubber compounds which cure at room temperature.

1.2 Application

This sealing compound has been used typically for sealing and repairing integral fuel tanks, cabin pressure sealing, and aerodynamic smoothing, but usage is not limited to such applications. It may be used for faying surface sealing, for wet installation of fasteners, for overcoating fasteners, and for sealing joints and seams. The sealing compound can be used in fuel areas as well as in non-fuel areas. It may, in some cases, be used as a non-structural adhesive. The sealant is capable of continuous service use from -65 to +250 °F (-54 to 121°C). AMS3100 adhesion promoter may be applied prior to application of the sealant.

1.3 Classification

1.3.1 Types

Sealing compounds covered by this specification are classified as follows:

Type 1 - Dichromate Cured Sealant. Material with a dichromate curing agent.
Type 2 - Manganese Dioxide Cured Sealant. Material with a manganese dioxide curing agent.

1.3.2 Classes

The following classes apply to both Type 1 and Type 2 sealing compounds:

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

A-1/2
A-1
A-2

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For more information on this standard, visit
https://www.sae.org/standards/content/AMSS8802F/

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

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

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

Notation: ( ) Assembly time, in hours:

C-8(20)
C-8(48)
C-24(80)

1.4 Safety - Hazardous Materials

Shall be in accordance with AS5502 (1.1).

2. APPLICABLE DOCUMENTS

Shall be in accordance with AS5502 (Section 2).

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2629	Fluid, Jet Reference
AMS3100	Adhesion Promoter for Polysulfide Sealing Compounds
AMS4045	Aluminum Alloy Sheet and Plate, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr, 7075: (-T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated
AMS4911	Titanium Alloy, Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS5516	Steel, Corrosion-Resistant, Sheet, Strip, and Plate, 18Cr - 9.0Ni (SAE 30302), Solution Heat Treated
AMS-C-27725	Coating, Corrosion Preventative, for Aircraft Integral Fuel Tanks for Use to 250 °F (121 °C)
AS5127	Aerospace Standard Test Methods for Aerospace Sealants Methods for Preparing Aerospace Sealants Test Specimens
AS5127/1	Test Methods for Aerospace Sealants, Two-Component Synthetic Rubber Compounds
AS5502	Standard Requirements for Aerospace Sealants and Adhesion Promoters

2.2 U.S. Government Publications

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

MIL-DTL-81706	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-PRF-23377	Primer Coatings: Epoxy, High Solids

2.3 PRI Publications

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

OP 2007 Appendix G9 Additional Requirements for the Aerospace Sealants and Associated Materials (G9) QPG

PRI-QPL-AMS-S-8802 Products Qualified Under AMS-S-8802

3. TECHNICAL REQUIREMENTS

3.1 Materials

The basic ingredient used in the manufacture of these products shall be polysulfide synthetic rubber. 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 or leachable chromate 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.

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 per 4.3.3.

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 the date of mix/freeze. Recommendations for longer storage lives at lower temperatures may be provided by the manufacturer. The date of mix/freeze shall be within the shelf life of the unmixed material.

3.6 Properties

With the exception of viscosity testing, the base compound and the curing agent, when mixed in accordance with manufacturer's instructions and cured as in 4.5.3.5, shall conform to the requirements shown in Table 1, when determined in accordance with the specified test methods.

Table 1 - Properties

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.1	Nonvolatile Content, by Weight, Minimum		AS5127/1 (5.1)
	Class A	84%	
	Class B	90%	
	Class C	90%	
3.6.2	Viscosity of Base Compound		AS5127/1 (5.3)
	Class A (Use No. 6 Spindle at 10 rpm)	100 to 500 poises (10 to 50 Pa•s)	
	Class B (Use No. 7 Spindle at 2 rpm)	9000 to 14000 poises (900 to 1400 Pa•s)	
	Class C (Use No. 6 Spindle at 2 rpm)	1000 to 4000 poises (100 to 400 Pa•s)	
3.6.3	Flow		AS5127/1(5.5)
	Class B	0.75 inch (19 mm), Max	AS5127/1 (5.5.1)
	Class C	0.010 inch (0.25 mm), Min Measurement taken after assembly time	AS5127/1 (5.5.2)
3.6.4	Application Time, Minimum		AS5127/1 (5.6)
	Class A from Beginning of Mixing the Viscosity Shall Not Exceed 2500 Poise (250 Pa•s) (Use No. 7 Spindle at 10 rpm)		AS5127/1 (5.6.1)
	A-1/2	1/2 hour	
	A-1	1 hour	
	A-2	2 hours	
	Class B from Beginning of Mixing, Not Less Than 15 Grams per Minute Shall Be Extruded		AS5127/1 (5.6.2)
	B-1/2	1/2 hour	
	B-1	1 hour	
	B-2	2 hours	
	B-4	4 hours	
	Class C from Beginning of Mixing, Not Less Than 30 Grams per Minute Shall Be Extruded		AS5127/1 (5.6.2)
	C-8(20)	8 hours	
	C-8(48)	8 hours	
	C-24(80)	24 hours	
3.6.5	Assembly Time (Class C Only), Minimum		AS5127/1 (5.7)
	C-8(20)	20 hours	
	C-8(48)	48 hours	
	C-24(80)	80 hours	

Table 1 - Properties (continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.6	Tack-Free Time (Measured from Beginning of Mixing), Maximum		AS5127/1 (5.8)
	A-1/2	10 hours	
	A-1	20 hours	
	A-2	40 hours	
	B-1/2	10 hours	
	B-1	20 hours	
	B-2	40 hours	
	B-4	48 hours	
3.6.7	Cure Time to Hardness, Maximum (Time to Reach 30 Type A Durometer)		AS5127/1 (5.9)
	A-1/2	40 hours	
	A-1	55 hours	
	A-2	72 hours	
	B-1/2	30 hours	
	B-1	55 hours	
	B-2	72 hours	
	B-4	90 hours	
	C-8(20)	168 hours	
	C-8(48)	336 hours	
	C-24(80)	4 weeks	
3.6.8	Fluid Immersion Cure Time, Minimum (Classes A-1/2 and B-1/2 Only)		AS5127/1 (5.11)
	After 48 hours	25 Type A Durometer	
	After 120 hours	35 Type A Durometer	
3.6.9	Specific Gravity, Maximum Average	1.65	AS5127/1 (6.1)
3.6.10	Hydrolytic Stability, Minimum	30 Type A Durometer	AS5127/1 (6.6)
3.6.11	Chalking, Maximum (Use AMS2629 Type 2)	Slight	AS5127/1 (7.1)
3.6.12	Resistance to Thermal Rupture Oven Air Aging at 250 °F (121 °C), 10 psi ± 1 psi (69 kPa ± 6.9 kPa), 60 Minutes	No blistering or sponging, 0.125 inch (3.2 mm), Max	AS5127/1 (7.2)
3.6.13	Weight Loss and Flexibility		AS5127/1 (7.4)
	Weight Loss, Maximum	8%	
	Flexibility	No cracking or checking	
3.6.14	Low Temperature Flexibility	No visual evidence of cracking or checking, no loss of adhesion	AMS-S-8802 (4.6.1) and AS5127/1 (7.6)

Table 1 - Properties (continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.15	Tensile Strength and Elongation, Minimum (Class B Only)		AS5127/1 (7.7)
3.6.15.1	Cure per 4.5.3.5	200 psi (1379 kPa), 200% elongation	
3.6.15.2	Cure per 4.5.3.5 + 14 Days at 140 °F (60 °C) in AMS2629 Type 1	50 psi (345 kPa), 200% elongation	
3.6.15.3	Cure per 4.5.3.5 + 7 Days at 250 °F ± 5 °F (121 °C ± 3 °C) in Air	125 psi (862 kPa), 100% elongation	
3.6.15.4	Cure per 4.5.3.5 + 72 Hours at 140 °F (60 °C) in AMS2629 Type 1 + 72 Hours at 120 °F (49 °C) in Air + 7 Days at 250 °F ± 5 °F (121 °C ± 3 °C) in Air	200 psi (1379 kPa), 75% elongation	
3.6.15.5	Cure per 4.5.3.5 + 24 Hours at 250 °F ± 5 °F (121 °C ± 3 °C) + 7 Days at 140 °F (60 °C) in AMS2629, Type 1	100 psi (689 kPa), 150% elongation	
3.6.16	Shear Strength, Minimum (Class C Only)	200 psi (1379 kPa), 95% cohesive failure	AS5127/1 (7.8)
3.6.17	Corrosion Resistance	No corrosion under sealant or signs of deterioration	AS5127/1 (7.9)
3.6.18	Peel Strength, Minimum	All 100% cohesive failure	AMS-S-8802 (4.6.2)
3.6.18.1	Classes A and B		
	After 7 Day Exposure	20 lbf/inch (3500 N/m)	
	After 70 Day Exposure	7 lbf/inch (1225 N/m)	
3.6.18.2	Class C		
	After 7 Day Exposure	15 lbf/inch (2625 N/m)	
	After 70 Day Exposure	7 lbf/inch (1225 N/m)	
3.6.19	Fluid Immersed Peel Strength, Minimum (Classes A-1/2 and B-1/2 Only)	10 lbf/inch (1750 N/m)	AS5127/1 (8.1.3)
3.6.20	Repairability, Minimum On Itself and Other Qualified AMS-S-8802 Sealants	10 lbf/inch (1750 N/m) /100% cohesive failure	AS5127/1 (8.2)

Table 1 - Properties (continued)

Paragraph	Property	Requirement	Test Procedures (Paragraph)
3.6.21	Storage Stability		
3.6.21.1	Accelerated Storage		AS5127/1 (9.1)
3.6.21.1.1	Appearance	No skinning, hardening or separation that cannot be restored by normal agitation	
3.6.21.1.2	Flow	Same as 3.6.3	
3.6.21.1.3	Application Time	Same as 3.6.4	
3.6.21.1.4	Assembly Time	Same as 3.6.5	
3.6.21.1.5	Tack Free Time	Same as 3.6.6	
3.6.21.1.6	Cure Time to Hardness	Same as 3.6.7	
3.6.21.1.7	Peel Strength: Minimum, Two Aluminum Panels, Sulfuric Acid Anodized in Accordance with AS5127 (6.3) and Coated with AMS-C-27725 Type 2, After 7 Days Immersion in AMS2629 Type 1/3% Salt Water at 140 °F (60 °C)	20 lbf/inch (3500 N/m) /100% cohesive failure	AS5127/1 (8.1)
3.6.21.2	Long-Term Storage		AMS-S-8802 (4.6.3) and AS5127/1 (9.2)
3.6.21.2.1	Appearance	No skinning, hardening or separation that cannot be restored by normal agitation	
3.6.21.2.2	Application Time	Same as 3.6.4	
3.6.21.2.3	Tack-Free Time, Maximum		
	A-1/2	16 hours	
	A-1	30 hours	
	A-2	64 hours	
	B-1/2	16 hours	
	B-1	30 hours	
	B-2	64 hours	
	B-4	72 hours	
3.6.21.2.4	Cure Time to Hardness, Maximum (Time to Reach 30 Type A Durometer)		
	A-1/2	64 hours	
	A-1	78 hours	
	A-2	112 hours	
	B-1/2	45 hours	
	B-1	78 hours	
	B-2	112 hours	
	B-4	136 hours	

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 and Testing

Shall be in accordance with AS5502 (4.3).

4.2 Classification of Tests

Shall be in accordance with AS5502 (4.2).

4.2.1 Qualification Tests

Shall be in accordance with AS5502 (4.2.1)

4.2.1.1 Qualification Requirements for Class B-2

Class B-2 shall be the first material that is qualified for each supplier of sealing compound. 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 or application times of the sealing compound.

4.2.1.2 Qualification Requirements for Other Classes and Application Times

Once qualification for Class B-2 has been obtained, other classes of the sealing compound and additional application times of qualified classes may be qualified. The formulation for other classes, and for other application times of qualified classes, 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. Other classes of the sealing compound need only to be tested to the initial acceptance tests listed in 4.2.2, resistance to thermal rupture (see 3.6.12), all peel strength tests listed in Table 5, and other tests as defined by the QPL agency. Application times of qualified classes need only to be tested to the initial acceptance tests listed in 4.2.2 and other tests as defined by the QPL agency. Any unique qualification tests for the sealant's class and application time shall also be tested per OP 2007 Appendix G9.

4.2.2 Initial Acceptance Tests

Requirements shown in Table 2 are initial acceptance tests and shall be performed on each batch in accordance with AS5502 (4.2.2.1).

Table 2 - Initial acceptance tests

Test	Requirement Paragraph
Nonvolatile Content	3.6.1
Viscosity of Base Compound[1]	3.6.2
Flow (Class B Only)	3.6.3
Application Time	3.6.4
Assembly Time (Class C Only)	3.6.5
Tack-Free Time (Classes A and B Only)	3.6.6
Cure Time to Hardness	3.6.7
Fluid Immersion Cure Time (Classes A-1/2 and B-1/2 Only)	3.6.8
Shear Strength (Class C Only)	3.6.16
Peel Strength:	3.6.18
Two Aluminum Panels, AMS4045, Sulfuric Acid Anodized in Accordance with AS5127 (6.3), and Coated with AMS-C-27725 Type 2; Condition for 7 days in AMS2629 Type 1/3% Salt Water)	

[1] Testing is not required if material is provided in sectional-type containers for initial acceptance testing.

4.2.3 Final Acceptance Tests

Requirements shown in Table 3 are final acceptance tests and shall be performed on each lot of the final packaged product in accordance with AS5502 (4.2.2.2).

Table 3 - Final acceptance tests

Test	Requirement Paragraph
Flow (Class B Only)	3.6.3
Application Time	3.6.4
Tack-Free Time (Classes A and B Only)	3.6.6
Cure Time to Hardness	3.6.7

4.3 Sampling and Testing

Shall be in accordance with AS5502 (4.3).

4.3.1 Qualification Tests

Sample batches shall be produced using production scaled equipment. Enough material shall be supplied to perform all required tests.

Samples shall be identified as follows:

Sealing Compound, Fuel-Resistant, Integral Fuel Tanks and Fuel Cell Cavities
AMS-S-8802F Type and Class
MANUFACTURER'S IDENTIFICATION _____
BATCH/LOT NUMBER _____
DATE OF PACKAGING _____
SHELF LIFE EXPIRATION DATE _____
STORE BELOW 80 °F (27 °C)

4.3.2 Acceptance Tests

Shall be in accordance with AS5502 (4.3.1).

4.3.2.1 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.

4.3.2.2 Initial and Final Acceptance Tests

Sufficient material of each batch shall be prepared for initial and final acceptance testing and shall be packaged in the same type containers that are being procured. After successful completion of the initial acceptance tests listed in Table 2, the batch shall be released for final packaging. During packaging, test kits from each lot 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 Table 3.

4.3.2.3 Final Acceptance Tests for Different Types and/or Size Containers

If a 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.

4.3.3 Shelf-Life Extension

4.3.3.1 Shelf-Life Testing

The tests to be conducted for shelf-life extensions are listed in Table 4.

Table 4 - Shelf-life testing

Test	Requirement Paragraph
Viscosity of Base Compound[1]	3.6.2
Flow (Class B Only)	3.6.3
Application Time	3.6.4
Assembly Time (Class C Only)	3.6.5
Tack-Free Time (Classes A and B Only)	3.6.6
Cure Time to Hardness	3.6.7
Peel Strength Two Aluminum Panels, AMS4045, Sulfuric Acid Anodized in Accordance with AS5127 (6.3), Coated with AMS-C-27725 Type 2, and Aged in AMS2629 Type 1 for 7 days at 140 °F (60 °C)	3.6.18

[1] Testing is not required if material is provided in sectional-type containers.

4.3.3.2 Time and Limits of Shelf Life Extensions

If tests are being performed at the end of the stated shelf life to extend the shelf-life of the sealing compound, and all tests are passed, the shelf-life may be extended an additional 3 months. A maximum of three extensions are allowed.

4.4 Approval

Shall be in accordance with AS5502 (4.4).