



AEROSPACE MATERIAL SPECIFICATION	AMS3277™	REV. L
	Issued 1995-04 Revised 2024-06	
	Superseding AMS3277K	
Sealing Compound, Polythioether Rubber Fast Curing for Integral Fuel Tanks and General Purpose, Intermittent Use to 360 °F (182 °C)		

RATIONALE

Five-Year Review. Remove Class C material requirements since this Class is not utilized due to incompatibility between required work life and material chemistry. Change reference testing fluid from AMS3020 to AMS3400 and AMS3021 to AMS3023, including general specification editorial updates.

1. SCOPE

1.1 Form

This specification covers polythioether rubber fuel-resistant sealing compounds supplied as a two-component system that cures at room temperature.

1.2 Application

This product is intended for use in aircraft integral fuel tanks for repair of fillet and fastener seals and faying surface seals as well as initial sealing of faying surfaces, overcoating of fasteners, and sealing of seams and joints for service from - 80 to +320 °F (-62 to +160 °C), with short-term recurring exposures (approximately 6 hours) up to 360 °F (182 °C), but usage is not limited to such applications. This product is not recommended for use on aircraft windshields or canopies or other applications where crazing or degradation of plastic components may occur. Sealing compound should be applied at temperatures above 50 °F (10 °C) but will cure at lower temperatures.

1.2.1 Notice

This material is mix-ratio sensitive and will cure at temperatures as low as 20 °F (-7 °C). Normal mix/freeze operations used with polysulfide sealants are not adequate as this material requires lower freezer storage temperature (see 3.5.1) for mix/frozen material.

1.3 Classification

Sealing compounds covered by this specification are classified as follows:

Type 1 - Sealing compound requiring an adhesion promoter for proper adhesion. An adhesion promoter is supplied with Type 1 material and must be applied prior to the sealing compound.

Type 2 - Sealing compound not requiring an adhesion promoter for proper adhesion.

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1.3.1 Grades

The material shall be supplied in the following grades:

Grade 1 – Cured specific gravity of 1.35 to 1.50

Grade 2 - Cured specific gravity of 1.16 to 1.34

Grade 3 - Cured specific gravity of 1.15, maximum

NOTE: Grade 3 material should not be used for sealing of fay joints.

1.3.2 Classification

Both Type 1 and Type 2 sealing compounds may be supplied in the following classes:

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

A-1/4

A-1/2

A-1

A-2

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

B-1/4

B-1/2

B-2

B-4

B-6

B-12

1.4 Safety - Hazardous Materials

Shall be in accordance with AS5502, 1.1.

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.

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

AMS3023 Fluid, Reference for Testing Polyol Ester (and Diester) Resistant Material

AMS3276 Sealing Compound, Integral Fuel Tanks and General Purpose, Intermittent Use to 360 °F (182 °C)

AMS3400 Fluid, Reference for Testing Polyalphaolefin (PAO) Resistant Material

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 (302), 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 Sealant Test Specimens
AS5127/1	Aerospace Standard 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-PRF-23377 Primer Coating, Epoxy High Solids

MIL-PRF-83282 Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base Metric, NATO Code Number H-537

MIL-PRF-85285 Coating, Polyurethane, Aircraft and Support Equipment

MIL-PRF-85582 Primer Coatings: Epoxy, Waterborne

2.3 PRI Publications

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

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

PRI-QPL-AMS3277 Products Qualified Under AMS3277

2.4 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 D4214 Standard Test Method for Evaluating the Degree of Chalking of Exterior Paint Films

3. TECHNICAL REQUIREMENTS

3.1 Materials

The basic ingredient shall be polythioether 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 compound shall contain no lead compounds. The curing agent shall possess enough color contrast to the 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.

3.2 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 when stored between 60 °F and 80 °F (16 °C and 27 °C). 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 -80 °F (-62 °C) or lower 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, when mixed in accordance with the manufacturer's instructions and cured as in 4.5.4.5, shall conform to the requirements shown in Table 1, determined in accordance with specified test methods.

Table 1 - Properties

Paragraph	Property	Requirement	Test Method
3.6.1	Nonvolatile Content, (% by weight), minimum Class A Class B	84% 96%	AS5127/1, 5.1
3.6.2	Viscosity of Base Compound Class A Class B	100 to 600 poises (10 to 60 Pa·s) 9000 to 18000 poises (900 to 1800 Pa·s)	AS5127/1, 5.3 Use No. 6 spindle at 10 rpm Use No. 7 spindle at 2 rpm
3.6.3	Flow Class B, maximum	0.75 inch (19.0 mm)	AS5127/1, 5.5.1
3.6.4	Application Time, minimum		AS5127/1, 5.6
3.6.4.1	Class A - From the beginning of mixing, the viscosity shall not exceed 2500 poises. (250 Pa·s). A-1/4 A-1/2 A-1 A-2	1/4 hour 1/2 hour 1 hour 2 hours	AS5127/1, 5.6.1 Use No. 7 spindle at 10 rpm
3.6.4.2	Class B - From the beginning of mixing, not less than 15 grams per minute shall be extruded. B-1/4 B-1/2 B-2 B-4 B-6 B-12	1/4 hour 1/2 hour 2 hours 4 hours 6 hours 12 hours	AS5127/1, 5.6.2
3.6.5	Tack Free Time (Measured from the beginning of mixing), maximum		AS5127/1, 5.8

Table 1 - Properties (continued)

Paragraph	Property	Requirement	Test Method
3.6.5.1	Standard Conditions Class A-1/4, B-1/4 Class A-1/2, B-1/2 Class A-1 Class A-2, B-2 Class B-4 Class B-6 Class B-12	1 hour 3 hours 6 hours 12 hours 48 hours 72 hours 96 hours	
3.6.5.2	Low Temp, 20 °F (-7 °C) Class A-1/4, B-1/4 Class A-1/2, B-1/2 All other classes/application times	8 hours 24 hours N/A	
3.6.5.3	Low Temp, 40 °F (4 °C) Class A-1/4, B-1/4 Class A-1/2, B-1/2 All other classes/application times	4 hours 12 hours N/A	
3.6.6	Cure Time to Hardness (time to reach 25 Durometer Type A), max.		AS5127/1, 5.9
3.6.6.1	Standard Conditions Class A-1/4, B-1/4 Class A-1/2, B-1/2 Class A-1 Class A-2, B-2 Class B-4 Class B-6 Class B-12	2 hours 4 hours 8 hours 16 hours 48 hours 72 hours 96 hours	AS5127/1, 5.9
3.6.6.2	Low Temp 20 °F (-7 °C) Class A-1/4, B-1/4 Class A-1/2, B-1/2 All other classes/application times	12 hours 24 hours N/A	AS5127/1, 5.10
3.6.6.3	Low Temp 40 °F (4 °C) Class A-1/4, B-1/4 Class A-1/2, B-1/2 All other classes/application times	6 hours 12 hours N/A	AS5127/1, 5.10
3.6.7	Fluid Immersion Cure Time, max (Shore A 25 or equivalent, min) Class A-1/4, B-1/4 Class A-1/2, B-1/2 All other classes/application times	3 hours 6 hours N/A	AS5127/1, 5.11, except measure hardness after 3 hours cure plus 1 hour in fluid for A-1/4, B-1/4; and after 6 hours cure plus -4 hours in fluid for A-1/2, B-1/2
3.6.8	Specific Gravity, Grade 1 Grade 2 Grade 3	1.35 - 1.50 1.16 - 1.34 1.15 max	AS5127/1, 6.1
3.6.9	7-Day Hardness, minimum	30 Durometer Type A Hardness, or equivalent	AS5127/1, 6.2
3.6.10	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 Standard Heat Cycle in accordance with 4.5.3

Table 1 - Properties (continued)