



AEROSPACE MATERIAL SPECIFICATION

AMS3278™**REV. C**Issued 2004-07
Revised 2022-11

Superseding AMS3278B

Sealing and Coating Compound, Polyurethane (PUR)
Fuel Resistant, High Tensile Strength/Elongation
for Integral Fuel Tanks/Fuel Cavities/General Purpose

RATIONALE

AMS3278C results from a Five-Year Review and updates the test requirements to match the application of this sealant.

1. SCOPE

1.1 Form

This specification covers polyurethane (PUR) in the form of two-component sealing compounds.

1.2 Application

This product has been used typically for contact with fuels, but usage is not limited to such applications. Each application should be considered separately. This polyurethane (PUR) has a service temperature range of -65 to +250 °F (-54 to +121 °C) with a continuous fuel service temperature range of -65 to +160 °F (-54 to +71 °C). It may be used for faying surface sealing, wet-installation of fasteners, overcoat of fasteners, sealing joints and seams and, in some cases, as a non-structural adhesive.

NOTE: The use of the manufacturer's recommended adhesion promoter may be required to obtain proper adhesion.

1.3 Classification

Sealing compounds covered by this specification are classified as follows:

1.3.1 Types

Type 1 - Non-corrosion inhibiting

Type 2 - Corrosion inhibiting

1.3.2 Classes

Class A - For application by brush or spray. Available in the following application times:

A-4

Class B - For application by extrusion gun or spatula. Available in the following application times:

B-1/2

B-1

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Documents

Document Sharing Hub

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.

AMS3276	Sealing Compound, Integral Fuel Tanks and General Purpose, Intermittent Use to 360 °F (182 °C)
AMS3277	Sealing Compound, Polythioether Rubber Fast Curing for Integral Fuel Tanks and General Purpose, Intermittent Use to 360 °F (182 °C)
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-S-8802	Sealing Compound, Fuel Resistant, Integral Fuel Tanks and Fuel Cell Cavities
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 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 D1319	Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption
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2.3 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-DTL-83133	Turbine Fuel, Aviation, Kerosene Types, JP-8 (NATO F-34), NATO F-35, and JP-8+100 (NATO F-37)
MIL-PRF-23377	Primer Coatings: Epoxy, High Solids
MIL-PRF-85285	Coating, Polyurethane, Aircraft and Support Equipment
MIL-PRF-85582	Primer Coatings: Epoxy, Waterborne

2.4 PRI Publications

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

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

PRI-QPL-AMS3278 Products Qualified Under AMS3278

3. TECHNICAL REQUIREMENTS

3.1 Materials

The basic ingredient shall be synthetic rubber of the polyurethane type. The sealing compound shall cure by the addition of a curing agent. 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 4.3.2.

3.6 Properties

The sealing compound, when mixed in accordance with the manufacturer's instructions and cured as specified in 4.5.3.5, shall conform to the requirements shown in Table 1, determined in accordance with the specified test methods. If the material requires an adhesion promoter, the manufacturer's recommended adhesion promoter shall be applied per 4.5.3.3 for resistance to thermal rupture (3.6.10), low temperature flexibility (3.6.13), shear strength (3.6.15), corrosion (3.6.16), peel strength (3.6.17), and repairability (3.6.18 and 3.6.19) testing. If used, adhesion promoter—including number of coats—must be noted in the test report and included on the PRI-QPL-AMS3278.

Table 1 - Properties

Paragraph	Property	Requirement	Test Method
3.6.1	Nonvolatile Content by Weight, Minimum		AS5127/1 (5.1)
	Class A-4	55%	
	Classes B-1/2 and B-1	85%	
3.6.2	Viscosity of Base Compound		AS5127/1 (5.3)
	Class A-4	5 to 100 poises (0.5 to 10 Pa•s)	Use No. 4 spindle at 20 rpm
	Classes B-1/2 and B-1	5000 to 10000 poises (500 to 1000 Pa•s)	Use No. 7 spindle at 4 rpm
3.6.3	Flow (Initial), Maximum		AS5127/1 (5.5)
	Class B only	0.75 inch (19.0 mm)	AS5127/1 (5.5.1)
3.6.4	Application Time, Minimum		AS5127/1 (5.6)
	Class A - From the beginning of mixing, the viscosity shall not exceed 2000 poises (200 Pa•s)		AS5127/1 (5.6.1)
	A-4	4 hours	
	Class B - From beginning of mixing, not less than 15 g/min shall be extruded		Use No. 5 spindle at 2 rpm
	B-1/2	1/2 hour	AS5127/1 (5.6.2)
	B-1	1 hour	
3.6.5	Tack-Free Time, Measured from the Beginning of Mixing, Maximum		AMS3278 (4.6.4)
	Class A-4	2.5 hours	
	Class B-1/2	3.5 hours	
	Class B-1	4 hours	
3.6.6	Cure Time to Hardness, Time to Reach 50 Durometer A, Maximum		AS5127/1 (5.9)
	Class A-4	24 hours	
	Class B-1/2	18 hours	
	Class B-1	20 hours	
3.6.7	Specific Gravity, Maximum	1.2	AS5127/1 (6.1)
3.6.8	14-Day Hardness, Minimum	50 Shore A	AS5127/1 (6.2)
3.6.9	Hydrolytic Stability, Minimum	30 Durometer A	AS5127/1 (6.6)
3.6.10	Resistance to Thermal Rupture		
	Class B only	No blistering or sponging	AS5127/1 (7.2)
	Fluid immersion shall be in adjusted JP-8 (4.6.2)	0.125 inch (3.18 mm), maximum	250 °F ± 5 °F (121 °C ± 3 °C) at 10 psi (69 kPa) for 60 minutes
3.6.11	Weight Loss and Flexibility		AS5127/1 (7.4)
	Weight loss, maximum	8%	
	Flexibility	No cracking or checking	
3.6.12	Volume Swell, Maximum	35%	AS5127/1 (7.5)
	In adjusted JP-8 (4.6.2)		
3.6.13	Low Temperature Flexibility		
	In adjusted JP-8 (4.6.2) for 14 days at 160 °F (71 °C)	No cracking or checking No loss of adhesion	AS5127/1 (7.6)