



# 3M™ Structural Adhesive SA9860

## Technical Data Sheet

### Description

3M™ Structural Adhesive SA9860 is a two-component paste adhesive which provides good adhesion and high impact peel performance to prepared surfaces such as passivated and E-coated aluminum typically used for Automotive structural bonding applications.

3M™ Structural Adhesive SA9860 delivers a robust, fatigue resistant structural joint with good bond strengths. This adhesive delivers high impact resistance when cured at room temperatures, eliminating the need for oven processing, reducing energy and associated costs. It is suitable for applications where oven curing is not desired. This product also facilitates multi-material bonding - including composites - enabling light-weighting of structures.

### Product Features and Benefits

- Reaches handling strength (1 MPa) in less than 2 hours when cured at room temperature
- Offers non-sag, thixotropic properties
- Provides good mechanical performance and long-term durability in a wide temperature range, maintaining structural strength and a durable bond under various environmental conditions
- Can be dispensed with automated dispensing equipment



### Product Characteristics

Packaging	400 mL, 18 L, 50 L and 182 L	
Base	Epoxy (B)	Amine (A)
Density (approx.) g/mL (EN 542)	0.94 to 0.99	0.99 to 1.02
Color	Off white	Black
Density cured g/cm <sup>3</sup> (EN 542)	0.99 ± 0.03	

Bulk dispensing information, rheology data, and a material data card for CAE modelling are available on request. Please consult with 3M application engineering for specific details for your application.

### Handling / Process Properties

Storage (Standard Container Sizes)	Part B	Part A
Drums	182 L in 200 L	182 L in 200 L
Pails	18 L in 20L 50 L in 50 L	18 L in 20L 50 L in 50 L
Dual-Pack Cartridges	400 ml	
Dispensing	Mixed Adhesive	
Design Mix Ratio (B:A) by Weight	1.88 B	1.0 A
Design Mix Ratio (B:A) by Volume	2.0 B	1.0 A

### Performance Characteristics

Typical performance is shown below. These values are for reference only and should not be used for specification purposes.

3M understands that development of automotive applications is typically driven by specification requirements and performance. Each

OEM has their own unique criteria and 3M continues to develop suitable products to meet those demands. Please contact your 3M application engineer for support and to obtain specific test data.

The test specimens used to generate the data below were cured at 23°C for 72 hours, except for the passivated 6082 aluminum which was cured at 180°C for 30 minutes. Bond gap used was 0.25 mm.

#### Tensile Lap-Shear Strength (SAE1523) – Overlap Shear (OLS)

Substrate and Pre-treatment	Test Conditions	Shear Strength	Failure mode *
6063 Aluminum e-coated	@ 23°C	>20 MPa	CF
	@ 80°C	>8 MPa	CF
	@ -20°C	>20 MPa	CF+SF
A356 Aluminum e-coated	@ 23°C	>20 MPa	CF
	@ 80°C	>8 MPa	CF
	@ -20°C	>20 MPa	CF+AF
6082 Alodine passivation	@ 23°C	>20 MPa	CF
	@ 80°C	>8 MPa	CF
	@ -20°C	>20 MPa	CF
CFRP Composite abraded	@ 23°C	>20 MPa	SF
	@ 80°C	>8 MPa	CF
	@ -20°C	>20 MPa	CF+SF

\*Failure mode EN ISO 10365

#### Tensile Lap-Shear Strength (SAE1523) after Ageing

Substrate and Pre-treatment	Test Conditions	Shear Strength	Failure mode
2024T3 Aluminum P2 etched	OLS strength @ 23°C after 14 Day Cataplasma	> 70% strength retention	CF
6063 Aluminum e-coated		> 70% strength retention	CF
A356 Aluminum e-coated		> 70% strength retention	CF
CFRP Composite abraded		> 70% strength retention	CF/SF

#### Wedge Impact Peel Strength (ISO 11343)

Substrate and Pre-treatment	Curing Conditions	Test Conditions	Impact Strength	Failure mode
Steel, abraded	1 week @ 23°C	@23°C	>18 KN/m	CF
Steel, abraded		@-20°C	>15 KN/m	CF

Substrate: symmetric wedge. sanded steel DX56D+Z. 20mm width / 0.8mm thickness

Testing velocity: 2 m/s

#### Fatigue Testing (ASTM D3166)

Cyclic loading of 1KN (R=0.1) can be applied to overlap shear test joints while simultaneously exposing the test joints to 50°C/95%RH during the whole test cycle. This type of fatigue testing in “hot/wet” conditions is a key discriminator of both adhesive and mechanical performance. All the test joints prepared with e-coated and etched aluminum survived at least 6 million cycles and were then tested to destruction in an Instron with high levels of strength retention. Please contact 3M application engineering for more details for your specific requirements.

#### Cure Speed

3M™ Structural Adhesive SA9860 achieves a 1MPa handling strength in 2 hours at 23°C. More data is available on request.

#### Induction Cure

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Heat acceleration profiles obtained by induction treatment are available from 3M application engineering on request.

## Shelf Life

Current shelf-life study shows stability for 12 months from date of manufacturing when stored at room temperature.

## Regulatory Information

Please refer to the product label and Safety Data Sheet (SDS) for health and safety information before using. The SDS can be found on [https://www.3m.com/3M/en\\_WW/sds-search-select-location/](https://www.3m.com/3M/en_WW/sds-search-select-location/).

## Contact Information

The information provided in this technical document is intended as a guide for these products. For more information or help in selecting a 3M product for an application, please contact your 3M technical service representative or call 1-800-328-1684.

**Intended Use:** These products are intended for use in general bonding and joining assembly, structural bonding assembly, bonding of dissimilar materials, and battery enclosure sealing in automotive, off-highway, industrial and marine applications. Since there are many factors that can affect a product's use, the customer remains responsible for determining whether the 3M product is suitable and appropriate for the customer's specific application and system, including customer conducting an appropriate risk assessment and evaluating the 3M product in customer's application and system. **Restricted Use:** 3M advises against the use of this 3M product in any application other than the stated intended use(s), since other applications have not been evaluated by 3M and may result in an unsafe or unintended condition.

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