



Adhesive, Two-Part, Urethane, FRP-SMC

1 Scope

This specification describes the mixture of a two (2)-part adhesive for primerless bonding of Fiber Reinforced Plastic (FRP) panels or Sheet Molding Composite (SMC) to FRP, primed steel or primed aluminum.

1.1 Material Description. The adhesive system is comprised of a resin component 9986131 and a hardener component 9982264. The mixture of 9986131 and 9982264 is identified as 9982265.

1.2 Symbols. Not applicable.

1.3 Applicability. The mixture of the hardener component 9982264 with the resin component 9986131 when mixed in the correct ratio will result in an adhesive that is suitable for bonding vehicle structures.

1.4 Remarks. This system shall be capable of being metered, mixed and dispensed with current production equipment. It shall be compatible with production paint systems and cannot be adversely affected by paint oven temperatures reaching 130 °C.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D570	ASTM D1144	ASTM D3418	ASTM E831
ASTM D638	ASTM D1338	ASTM D4065	ISO 294
ASTM D790	ASTM D2240	ASTM D4092	SAE J1756
ASTM D792	ASTM D2369	ASTM D4339	SAE J2443

2.2 GM Standards/Specifications.

9982264	GMW3059	GMW14444	GMW15921
9986131	GMW14270	GMW15735	GMW16853

3 Requirements

3.1 Material Properties; Uncured Adhesive. See Table 1.

3.2 Color. The two (2) components shall be in contrasting colors. The colors shall be so chosen, that, in instances of improper mixing, color striations shall be visible in the dispensed bead.

Table 1: Material Properties; Uncured Adhesive

Properties	Values	Test Methods
Odor	The material shall not have a noxious odor either cured or uncured condition	ASTM D4339
Homogeneity	The material shall be homogeneous and free of lumps or air bubbles	Visual
Sag Resistance	< 5 mm	SAE J2443, ADS-10

Properties	Values	Test Methods
Working Time	2.5 minutes, minimum	ASTM D1338, Method A, 23 °C, dew point > 10 °C, 10 mm diameter bead
Time to Handling Strength	11 minutes, maximum	ASTM D1144, 23 °C
Time to Peak Exotherm	No peak observed at 23 °C	ASTM D3418
Cure Time, 23 °C	24 h	ASTM D1144
Solids Content	100% Reactive	ASTM D2369

3.3 Emissions Testing of Interior Materials and Parts. For all Code E designated parts per GMW14444, reference GMW16853 for emissions testing of interior materials and parts.

3.4 Additional Requirements. The manufacturer shall supply an Infra-red spectrum, a Differential Scanning Calorimetry scan and a Thermogravimetric scan of the mixed adhesive system.

3.5 Material Properties; Cured Adhesive. See Table 2.

Table 2: Material Properties; Cured Adhesive

Properties	Values	Test Methods
Density	1.26 gm/cm ³	ASTM D792
Hardness	Shore D: 69 nominal	ASTM D2240, Method A
Glass Transition Temperature	-35 °C	ASTM D3418
Coefficient of Thermal Expansion	220 µm/m/ °C	ASTM E831
Moisture Absorption	0.5% maximum	ASTM D570
Elongation	70% minimum	ASTM D638
Tensile Strength ^{Note 1}	Report	ASTM D638
Flexural Strength ^{Note 1}	Report	ASTM D790
Flexural Modulus ^{Note 1}	Report	ASTM D790
Poisson's Ratio ^{Note 1}	Report	ASTM D638
Young's Modulus	Report	ASTM D638
Shear Modulus	Report	ASTM D4065, ASTM D4092
Shrinkage	1% maximum	ISO 294-3/4
Fogging	None	SAE J1756 Photometric Method, bath temperature 85 °C (cooling temperature 38 °C)

Note 1: Measured on cast adhesive coupons.

3.6 Adhesive Properties (GMW15921). The adhesive system, including test specimens, prepared on production representative substrates as specified in the designated procedures, shall meet all the requirements of GMW15921.