

ADHESIVE, ONE PART, ANTI-FLUTTER, MEDIUM EXPANSION, MEDIUM STRENGTH

9986109

1 SCOPE. This specification covers a pumpable one-part adhesive suitable for bonding exterior automotive body panels for stiffening, and/or anti-flutter applications (i.e. Roof Panel to Roof Bows).

1.1 This material shall be compatible with production phosphatizing, ELPO, and top coat systems, and shall not be adversely affected by bake temperatures up to 204°C.

1.2 This material shall expand and cure in the heat of the ELPO (and subsequent) paint ovens. The amount of volumetric expansion exhibited by the material shall be approximately 300%. The resulting bond provided by the curing reaction shall render an adhesive strength, between the adhesive and the substrate, that is greater than the cohesive strength of the material.

2 REFERENCED STANDARDS.

GM1000M	GM9828P	SAE J243
GM3640M	ASTM D570	SAE J1524
GM9037P	ASTM D1875	SAE J1864
GM9010P	ASTM D4339	
GM9763P	ASTM E502	

3 REQUIREMENTS.

3.1 RESTRICTED AND REPORTABLE CHEMICALS (GM1000M). All materials supplied to this specification must comply with the requirements listed in GM1000M, "Restricted and Reportable Chemicals."

3.2 TOXICITY. The toxicity shall be disclosed in kind and magnitude, as required, by the GM Material Safety Data Sheet. In addition, the material must have full approval of the appropriate medical department prior to production use.

3.3 STABILITY (GM9763P). Material conditioned using potential storage conditions must be capable of passing all the requirements of this specification.

3.3.1 Elevated Temperature Stability. As shipped, the adhesive must be capable of withstanding a temperature of 55°C for 72 h, without separation or caking.

3.3.2 Low Temperature Stability. As shipped, the adhesive must be capable of withstanding 3 cycles of the applicable cycle schedule outlined in A2 of GM9763P.

3.3.3 Storage Stability. The shelf life of the material in closed containers shall be 90 days at a temperature not to exceed 35°C. Shelf life of the material commences upon the receipt of the material from the manufacturer.

3.4 PRESSURE STABILITY (SAE J1864). As shipped, the adhesive must not separate or cake.

3.5 NONSMOKING (GM9828P). The adhesive shall not smoke up to 177°C and shall not be classified greater than a slight smoker at 191°C.

3.6 MATERIAL PROPERTIES - UNCURED ADHESIVE. See Table 1.

TABLE 1

Properties	Values	Test Methods
Color	Off White	Visual
Odor	The material shall not have a noxious odor in either cured or uncured condition.	ASTM D4339
Sag Resistance	No sag or slide at room temperature or during bake	SAE J243, ADS-10, C
VOC	< or equal to 0.6 %	
Solids Content	98% min by weight	GM9010P
Viscosity	85 ± 10 s	SAE J1524
Density	1.33 ± 0.1 g/cm ³	ASTM D1875
Flash Point	> 200°C	ASTM E502
Homogeneity	Material must be homogeneous and free of lumps or air bubbles.	
Volumetric Expansion	300 ± 30%	GM9037P

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3.7 MATERIAL PROPERTIES - CURED ADHESIVE.

See Table 2.

TABLE 2

Properties	Values	Test Methods
Moisture Absorption	< 4% by weight	ASTM D570
Compression/Deflection	110 kPa @ 25%	
	420 kPa @ 50%	
Bondline Readthrough	No perceivable bondline readthrough.	

4 ADHESIVE PROPERTIES. Test specimens, prepared as specified in the designated procedures, must meet the requirements of the following specification GM3640M (Medium Strength).

4.1 This procedure must be repeated for each bonding system under consideration for the application.

5 OTHER TESTS MAY BE REQUIRED TO VALIDATE THE SPECIFIC APPLICATION.

6 INITIAL SOURCE APPROVAL. No shipment shall be made by any supplier until a submission of representative initial production samples to the purchaser's laboratory and/or engineering department has been approved as meeting the requirements of this specification.

6.1 Completed copies of the Material Safety Data Sheet meeting GM information requirements must be submitted with any new submissions or whenever a composition change has occurred.

7 INSPECTION AND REJECTION. All shipments of material or parts under contract or purchase order manufactured to this specification shall be equivalent in every respect to the initial samples approved by the purchaser. There shall be no changes in either formulation or manufacturing processes permitted without prior notification and approval by the purchaser. Lack of notification by the supplier constitutes grounds for rejection of any shipment. While samples may be taken from incoming shipments and checked for conformance to this specification, the supplier shall accept the responsibility for incoming shipments meeting this specification without dependence upon purchaser's inspection.

8 APPROVED SOURCES. Engineering qualification of an approved source is required for this specification. Only sources listed in the GM Corporate Materials File under this specification number have been qualified by the control division as meeting the requirements of this specification. Sources are available through the on-line MATSPC System.

9 GENERAL INFORMATION. This standard was originated by MCD and approved by the Adhesives Committee in February 1996.

Rev	Date	Description
A	2/96	Complete Revision