GM ENGINEERING STANDARDS	Material Specification	9985870

Adhesive, Two-Part, Acrylic, Resin

1 Scope

This specification is for the resin component, of a two-part adhesive for hem flange bonding. Sheet metal substrates include oily steels (galvanized and cold rolled) and aluminum. The resin component contains glass beads to maintain bondline thickness and minimize adhesive squeeze-out.

1.1 Material Description. The adhesive system is comprised of a resin component; 9985870 and a hardener component; 9985871. The mixture of 9985870 and 9985871 is identified as 9985872.

1.2 Symbols. Not applicable.

1.3 Applicability. The mixture of the resin and the hardener components when mixed in the correct ratio will result in an adhesive that is suitable for bonding the hems of vehicle closures or other hemmed structures.

1.4 Remarks. This system must 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 205 °C.

2 References

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

2.1 External Standards/Specifications.

ASTM D1875	ASTM D4339	ASTM E502	SAE J1524
ASTM D2369			

2.2 GM Standards/Specifications.

9985871	GMW3059	GMW14444	GMW16853
9985872	GMW14270	GMW15735	

2.3 Additional References. None.

3 Requirements

3.1 Requirements on Delivery.

3.1.1 Chemical Requirements.

3.1.1.1 Toxicity. The adhesive must not have any adverse effects on the personnel handling it. In addition, the supplier must submit a GM Material Safety Data Sheet (MSDS), receive approval from all medical, safety and industrial hygiene departments before the material can be used in production.

3.1.1.2 Color. The two components shall be in contrasting colors. The colors shall be so picked, that, in instances of improper mixing, color striations shall be visible in the dispensed bead.

3.2 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.

3.3 Physical Requirements.

3.3.1 Homogeneity. The material must be homogeneous and free of lumps and air bubbles.

3.3.2 Material Properties. See Table 1.

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Table 1: Material Properties

Properties	Values	Test Methods
Color (see 3.1.1.2)	White	Visual
Odor	The material shall not have a noxious odor in either the cured or uncured state.	ASTM D4339
Solids Content	85.9%	ASTM D2369
Viscosity	161 000 cps to 521 000 cps	SAE J1524, method: (VIS-1, HAT, TD) at 5 rpm, 25 °C.
Press Flow	2.1 s to 6.0 s	SAE J1524, method: (VIS-2), 2.64 mm orifice, 550 kPa, 25 °C.
Density	1.14 kg/L to 1.25 kg/L	ASTM D1875
Flash Point	> 93 °C	ASTM E502, SETAFLASH

3.3.3 Additional Requirements. The manufacturer shall supply an Infra-red spectrum and a Thermo-gravimetric scan of the material.

4 Manufacturing Process

4.1 Stability (GMW15735). Store in airtight containers (to prevent moisture curing effects) away from heat and sunlight.

4.2 Elevated Temperature. As shipped, the material must be capable of withstanding a temperature of 55 °C. Shelf life of the material commences upon the receipt of the material from the manufacturer.

4.3 Low Temperature. As shipped, the material must be capable of withstanding three (3) cycles of the applicable low temperature stability cycle outlined in GMW15735.

4.4 Storage. 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.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. Samples of components or materials released to a GM material specification shall be tested for conformity with the requirements of this material specification and approved by the responsible Engineering department prior to commencement of delivery of bulk supplies.

A new approval must be received for any changes, e.g., properties, manufacturing process, location of manufacture, etc. If not otherwise agreed, all testing and documentation normally required for initial release must be completed.

It is the responsibility of the supplier to inform the customer in a timely manner, without solicitation, and to include documentation of all modifications of materials and/or processes and to apply for a new release.

5.4 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements.

5.5 All materials supplied to this standard must comply with the requirements of the International Material Data System (IMDS) and GMW3059, **Restricted and Reportable Substances.**

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