

ADHESIVE, TWO-PART, EPOXY, STRUCTURAL-METAL**9982142 9982143 9982144**

1 SCOPE. This specification details the performance requirements for a two part epoxy used to bond hem flanges in Fab and also may be used in the Assembly Plant as a fast cure body shop structural adhesive.

The material shall be a 2 part air cure type epoxy which has good adhesion to oily C.R.S., oily galvanized, oily zincrometal and oily aluminum.

Both accelerator and base components shall be supplied in a totally deaired condition, that is, there shall be no entrapment of air or gas bubbles in the supplied containers of part A or part B.

The material shall withstand the power wash cleaning operation of assembly within 90 minutes of application to the autobody in the body shop.

2 REFERENCED STANDARDS.

GM9028P	GM9806P	GM9751P
GM9021P	GM9505P	MDS178
GM9011P	GM9761P	GM4298P
GM9749P	GM9832P	GM4565P

3 REQUIREMENTS.

3.1 COLOR. The color of the individual components must be readily distinguishable from the mix.

3.2 ODOR. As received and prior to curing. The adhesive must not be noxious. Ref.: GM9832P

3.2.1 During Cure. Must have less than 500 odor units, max. ED. 50. Ref.: ITT Research Institute Test Method for the Dynamic Triangle Olfactometer

3.2.2 After Cure. Must be relatively non-odorous. Ref.: GM9832P.

3.3 TOXICITY. The compound must not adversely affect those personnel handling it.

3.4 STABILITY.

3.4.1 Elevated Temperature. As shipped, the material must be capable of withstanding a temperature of 54 C for 72 h. with no adverse effects.

3.4.2 Low Temperature. As shipped, the material must be able to withstand 3 cycles of the appropriate cycle as outlined in Par. A2 of the test method.

3.4.3 Storage Stability. Shelf life of the material shall be 90 days at a temperature of 35 C. Shelf life of material commences upon receipt of material from the manufacturer.

3.5 SOLIDS CONTENT (GM9028P). Base & Accelerator 97% min.

3.6 VISCOSITY FLOW RATE (GM9021P).

Component	Time to Flow 20 g. of Matl. through 2.64 mm (0.104 in.) Orifice & Using 30 & 60 psi
Accelerator (9982143) Base (9982144)	These times will be determined for the individual suppliers & at time of approval they will become part of the specification.

3.7 MIX RATIO. Mix ratio of individual suppliers will be determined and at the time of approval will become part of the specification.

3.8 WORKING POT LIFE. Working pot life of the system will have a min of 20 minutes.

3.9 SAG RESISTANCE (GM9749P). The material shall not exhibit any perceptible slump or movement when tested with a 9.5 mm diameter bead applied over an oiled panel. When sandwiched between 2 oily pieces of steel 6.0 mm apart, the material must not run or flow out during cure or production baking operations.

3.10 POWER WASH OFF RESISTANCE. A 9.0 mm bead of mixed material applied to an oily steel panel will be subjected to a 1500 psi spray of room temperature water at a distance of 8 inches from the nozzle.

3.10.1 This test will be performed 90 min. after dispensing the bead to the panel at room temperature.

3.10.2 There shall be no wash off of the 2 part material.

3.10.3 After materials pass this Laboratory test they will be tested at National Liquid Blaster Corp. for final qualification.

3.11 STRENGTH REQUIREMENTS.

3.11.1 Sample Preparation (GM9806P).

- Samples air cured min. 24 h.
- Samples baked according to TM 45-132?

3.11.2 Overlap Shear Strength.

Room Temperature 18.6 MPa.
At any environment 13.8 MPa.
24 h. recovery 2500 psi. 17.2 MPa.

3.12 AGING CHARACTERISTICS. Overlap shear samples, after two weeks at 70 C (158 F) shall meet the min. environmental strength requirements as stated in this specification (shear and impact).

3.13 HUMIDITY RESISTANCE (GM4565P). Overlap shear samples, after being subjected to eight week exposure to 37 C and 100% RH, shall maintain the specified load requirements.

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3.14 SALT SPRAY ENVIRONMENT (GM4298P).

Overlap shear samples, after being subjected to 500 h. N.S.S., shall maintain the specified load requirements.

3.15 THERMAL STRESS CYCLE. Overlap shear samples, after being subjected to 8 week cycle of GM9505P Cycle E, shall maintain the specified load.

One set of samples will be pulled at the end of 8 week cycle.

3.16 WELDABILITY (MDS178). The adhesive must meet the requirements of Section 3.2 & 3.3a. of Test Method MDS-178.

The adhesive must be weldable for a min of 30 min. after mix.

3.17 PRESSURE STABILITY (GM9761P). Both parts of the adhesive system (Accelerator + Base) must be capable of withstanding pumping pressures without adversely affecting their flow characteristics. The materials shall not cake or separate after being subjected to 13 790 KPa. for 24 h.

3.18 COLD SHOCK RESISTANCE (GM9011P).

An assembly of a 101.6 (4 in.) x 101.6 (4 in.) x 0.9 mm (0.035 in.) steel panel bonded to a 254 (10 in.) x 254 (10 in.) x 0.9 mm (0.035 in.) oily steel panel with 72 h. air cure followed by the production bake as outlined in TM 45-132, must not separate after two 2.82 joules (25 in.lbs) reverse side impacts at -29 C (-20 F). Bond line thickness should be 3 mm (0.125 in.).

4 INITIAL SOURCE APPROVAL. No shipment shall be made by any supplier until representative initial production

samples have been approved by engineering as meeting the requirements of this specification.

4.1 Completed copies of the GM Material Safety Data Sheet and Critical Material Register (available from the engineering department or laboratory) must be submitted with any new submissions or where a composition change has occurred.

5 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 engineering. There shall be no changes in either formulation or manufacturing processes permitted without prior notification and approval by engineering. 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.

6 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.

7 GENERAL INFORMATION. This standard was issued by Fisher Body in November 1982. The latest revision includes the following: April 1989 editorial changes.