



Sealer - Pumpable, 300% Expandable, Weld-Through

1 Scope

1.1 Material Description. This specification details the requirements of a high bake, non-paintable, 300% expanding, fuel resistant, weld-through sealer capable of being pumped at ambient temperatures. The material is intended for use in the Body Shop to seal body joints against water, dust and air intrusion. The material must also have very even and controlled expansion characteristics to prevent gapping around the fuel filler pocket.

1.1.1 The material must be a smooth and homogeneous mixture free of air, lumps, unmixed particles and foreign materials. It must be capable of being dispensed with standard production pumping equipment.

1.1.2 The material must adhere to oily steel. It must have good weatherability and must not accelerate rusting of steel over which it is applied.

1.2 Symbols. Not applicable.

1.3 Applicability. Used in Body Shop to seal joints that are subsequently welded.

1.4 Remarks. Note: This is NOT a “global” material and is, therefore, NOT for release on new vehicle programs.

2 References

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

2.1 External Standards/Specifications.

ASTM D92	ASTM D1475	SAE J1524	SAE J1864
ASTM D638	ASTM D2369		

2.2 GM Standards/Specifications.

GMW3059	GMW14124	GMW16700	GMW16723
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2.3 Additional References.

Environmental Protection Agency (EPA) Method 24, Section 2.2 using ASTM D2369, Procedure B
GM Global Welding Standard GWS-5K, Welding Performance of Weld-Through Sealer & Adhesive (Steel)

3 Requirements

Specific material requirements are listed under 3.1 Physical Properties.

3.1 Physical Properties.

3.1.1 Specific Gravity (ASTM D1475). Typically 1.1 to 1.5. However, an individual specific gravity range for each approved source will be set at the time of approval to this specification. That range will then become a requirement for the material. This information shall be included in the material approval submission package.

3.1.2 Solids Content. Ninety-five percent (95%) minimum.

3.1.3 Volatile Organic Compound (VOC) Determination (EPA Method 24, Section 2.2 using ASTM D2369, Procedure B). Report the final VOC as well as all weights and calculations as data.

3.1.4 Viscosity (SAE J1524).

- Orifice 1.32 mm
- Pressure 275 kPa
- Sample Weight 20 g

Viscosity shall be recorded in seconds. A range shall be determined for each source and will become a requirement for that material at the time of approval.

3.1.5 Odor. The material must not have a toxic or noxious odor. After curing, the material must be relatively non-odorous.

3.1.6 Toxicity. The material must not adversely affect personnel handling it.

3.2 Performance Requirements.

3.2.1 Adhesion. The material must adhere to oily cold rolled steel (CRS), as well as electro and hot dip galvanized. Three sets of test panels shall be prepared and baked as follows:

- Low E-Coat bake – 20 minutes @158 °C + 25 minutes @157 °C + 25 minutes @ 115 °C
- Low E-Coat bake – 20 minutes @158 °C + 25 minutes @115 °C + 25 minutes @ 115 °C
- Target E-Coat bake – 30 minutes @163 °C + 25 minutes @157 °C + 25 minutes @ 115 °C
- Target E-Coat bake – 30 minutes @163 °C + 25 minutes @115 °C + 25 minutes @ 115 °C
- High bake E-Coat – 90 minutes @177 °C + 25 minutes @157 °C + 25 minutes @ 115 °C
- High bake E-Coat – 90 minutes @177 °C + 25 minutes @115 °C + 25 minutes @ 115 °C

3.2.1.1 Sealer bakes as described in 3.2.1 shall not crack or lose adhesion to the substrates during or after the following conditions:

- Initial – after cooling to ambient temperatures
- Exterior Cycle (Cycle “F”) – 12 cycles
- Heat Aging – 336 h @ 70 °C
- Humidity – 168 h @ 38 °C, 100% relative humidity (RH)
- Cold Slam – 10 slams at -30 °C

3.2.2 Tensile (ASTM D638). Material baked as described in 3.2.1 must have a minimum tensile strength of 6 kPa. The test pull speed shall be 2 mm/s.

3.2.3 Corrosion Resistance. Apply 2 beads of sealer (3 mm x 40 mm x 200 mm) to the surface of a phosphated steel panel. Bake the panel 1 h @ 200 °C. After bake, remove panel from oven and allow to cool.

3.2.3.1 Initial Observation. Remove one sealer bead from the panel and inspect the panel. There must not be any corrosion on the panel where the sealer had been.

3.2.3.2 After Humidity. Expose the panel with the remaining sealer bead to 38 °C, 100% RH for 168 h. Then remove the remaining bead and inspect the panel. There must be no corrosion on the panel where the sealer had been.

3.2.4 Expansion. Material baked as described in 3.2.1 shall have the following expansion performance: 300% ± 50%.

3.2.5 Shrinkage. Material baked as described in 3.2.1 shall exhibit no more than 5% shrinkage.

3.2.6 Fuel Resistance (GMW14124 Cycle L). The material must be able to withstand 5 cycles. There must be no loss of adhesion to the substrate or degradation of the material.

3.3 Process Requirements.

3.3.1 Sag. Material shall exhibit no “sag” or slide when “worked” and a 3 mm x 40 x mm 200 mm bead is applied to an oily steel panel which is then set on end.

3.3.2 Pressure Stability (SAE J1864). The material must be capable of withstanding pumping pressure of 22 400 kPa for 72 h without caking or separation of fluids.

3.3.3 Smoke. The material must not smoke up to 200 °C.

3.3.4 Flash Point (ASTM D92). Two hundred degrees Celsius (200 °C) minimum flashpoint.

3.3.5 Flame Resistance (GMW16723). The material shall resist 50 passes with an open flame and be self-extinguishing.

3.3.6 Wash Off Resistance (GMW16700 Method B). The material must provide a rating of 3 or higher.

3.3.7 Weldability (GWS-5K). Run test as specified in the procedure and report results.

3.3.8 E-Coat Compatibility. Material must not cause E-Coat to crater.