



Sealer - Low Bake, Paintable, Pumpable PVC

1 Scope

This specification covers the requirements of a low bake, appearance paintable, pumpable sealer. The material is intended to seal class A body joints against water, dust and air intrusion.

1.1 Material Description. 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.

The material must adhere to all production E-Coats. It must have good durability and must not accelerate the rusting of steel over which it is applied.

1.2 Symbols. Not applicable.

1.3 Applicability. Typically used for sealing interior body joints

1.4 Remarks. 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 D638	ASTM D1475	SAE J1524
ASTM D1002	ASTM D2369	SAE J1864

2.2 GM Standards/Specifications.

GMW3059

2.3 Additional References.

Environmental Protection Agency (EPA) Method 24, Section 2.2

3 Requirements.

Specific material requirements are listed under 3.1 Physical Properties. (All bake schedules are specified in time at metal temperatures.)

3.1 Physical Properties.

3.1.1 Specific Gravity (ASTM D1475). Typically 1.0 to 1.8. 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 2.64 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 Particle Size. The material must be capable of passing through a 60 mesh screen.

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

3.2 Performance Requirements.

3.2.1 Adhesion. One set of test panels for each current production E-coat shall be prepared and baked as follows:

- Low Bake Systems
- Nominal Primer/Topcoat – 25 minutes @ 121 °C + 25 minutes @ 121 °C
- Minimum Primer/Topcoat - 25 minutes @ 115 °C + 25 minutes @ 115 °C
- Maximum Primer/Topcoat – 90 minutes @ 135 °C + 90 minutes @ 135 °C

3.2.1.1 The material, when baked as previously described, must not crack or lose adhesion to the substrate 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 – 2 impacts of 1.7 J

3.2.2 Appearance. A full set of panels shall be prepared using a representative production topcoat technology from each of the major paint suppliers. The panels shall be prepared using the nominal bake schedule called out in section 3.2.1, unless a plant-specific bake schedule is called out by the appropriate GM engineer. In addition, two “partial” sets should be prepared using the minimum and maximum bake schedules in section 3.2.1. The material shall be checked under primer surfacer followed by topcoat as well as under primer only and topcoat only. Colors used for testing are: White, Black, Red and a Lt. Metallic. The application of primer over the sealer shall be wet-on-wet unless otherwise agreed upon by the appropriate engineering group and must not exhibit any cracking or stickiness after the primer bake (a slight amount of “drag” is permissible). The topcoat must not exhibit any loss of gloss, cracking, discoloration, tack, stickiness, or color transfer upon touch. The prepared samples shall be subjected to the following environments and must not exhibit any loss of adhesion after bake or exposure to environments:

- Initial
- Heat Aging – 336 h @ 70 °C
- Cycle Test – 13 cycles of Cycle “F”

3.2.3 Tensile (ASTM D638). Material baked as described in section 3.2.1 must have a minimum tensile strength of 700 kPa. The test pull speed shall be 2 mm/s.

3.2.4 Shear (ASTM D1002). Material baked as described in section 3.2.1 must have a minimum shear strength of 1000 kPa. Test pull speed shall be 2 mm/s.

3.2.5 Elongation. Material baked as described in section 3.2.1 must have a minimum elongation of 100%.

3.2.6 Shrinkage. Material baked as described in section 3.2.1 must have a maximum shrinkage of 5%.

3.2.7 The material must show no signs of trapped air from either an external observation or a sectional view, before or after baking.

3.2.8 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 @ 150 °C. After bake, remove panel from oven and allow to cool.

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

3.2.8.2 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.

3.2.9 Porosity. The material must show no sign of trapped air from either an external observation or a sectional view after curing.

3.3 Process Requirements.

3.3.1 Sag. Material shall exhibit a maximum of 5 mm “sag” when “worked” and a 3 mm x 40 mm x 200 mm bead is applied to a panel which is then set on end.