GM ENGINEERING STANDARDS	Material Specification	9984219

Sealer - Low Bake, Low Density Sprayable PVC

1 Scope

This specification covers the requirements of a low bake, low density, non-paintable, sprayable polyvinyl chloride (PVC) sealer. The material is intended to seal non-"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.

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

2 References

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 1.02 maximum. 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 415 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.

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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
- 25 minutes @115 °C
- +25 minutes @ 115 °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 – 10 slams @ -30 °C

3.2.2 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.

3.2.3 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.

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

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

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

3.2.7 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.

3.2.7.1 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.

3.2.7.2 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.

3.2.8 Topcoat Compatibility. While this is not an appearance material, the sealer must not adversely affect the cure of primer or topcoat applied over it. The material shall be checked under primer surfacer followed by topcoat as well as under 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. The prepared samples shall be subjected to the following environments:

- Initial
- Heat Aging – 336 h @ 70 °C
- Cycle Test – 13 cycles of Cycle "K"

There should be no transfer of color from the panel to hand. Slight blacklining, yellowing, loss of gloss or mottle are allowed.

3.3 Process Requirements.

3.3.1 Sag. Material shall exhibit no sag when "worked" and a 3 x 40 x 200mm bead is applied to a 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 Elevated Temperature Stability. The sealer as shipped must be capable of withstanding 72 h @ 54 °C and pass all requirements of this specification.

3.3.4 Storage Stability. The shelf life of the material shall be 60 days at temperatures not to exceed 35 °C. The shelf life of the material commences upon receipt of the material from the manufacturer.

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