



Two Part Sealer, Ambient Cure, Generic Qualification

1 Scope

This specification details the requirements of a two part seam sealer. The material is intended for application over Electrocoated (E-coat) substrates and after all paint ovens. The material must be capable of being manually or robotically applied and is intended to seal body joints against water, dust, air intrusion and corrosion. It must provide a tough durable seal without the use of heat to cure. The material cure rate must provide for; no "material transfer" during trim installation and ensure excellent adhesion before the vehicle leaves the plant.

1.1 Material Description. The material is a two part sealer consisting of a 1:1 mixture of a resin component (9984563) and an accelerator component (9984564). Each component, as well as the mixed material (9984562), must be smooth and homogeneous, free of air, lumps and unmixed particles or foreign materials.

1.1.1 The material must be capable of being applied with approved and validated production displacement pumping and two part dispense application equipment.

1.1.2 It must not have a noxious or toxic odor in either the uncured or cured state.

1.1.3 In addition, the material must not adversely affect the personnel handling it.

1.1.4 The material must adhere to all GM globally approved E-coated metal substrates.

1.2 Symbols. Not applicable.

1.3 Applicability. This material is typically applied to E-coated metal. It is not designed to be baked, it is designed for ambient cure only.

1.4 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

ASTM D412	ASTM D2369	ISO 3219	SAE J1524
ASTM D1475	EPA Method 24	ISO/TS 16949	SAE J1864
ASTM D2196			

2.2 GM Standards/Specifications.

9984562	GMW3025	GMW3235	GMW15634
9984563	GMW3059	GMW14124	GMW15635
9984564	GMW3205	GMW14270	GMW15735
GMW3019	GMW3221	GMW15481	GMW16701

2.3 Additional References.

- Advanced Product Quality Planning (APQP)
- Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) European Union.
- Toxic Substances Control Act (TSCA) United States

3 Requirements

Unless otherwise specified, the following requirements must be met. All testing shall be performed with materials that are representative of production processes.

3.1 Requirements on Test Specimens.

3.1.1 Test Specimen Conditioning. (GMW3221). Test specimens shall be conditioned per GMW3221, Code D.

© Copyright 2017 General Motors Company All Rights Reserved

3.2 Requirements on Delivery. Requirements in this section refer to the uncured material.

3.2.1 Specific Gravity (ASTM D1475). Typically 1.4 sp.g. $\pm$ 0.4 sp.g.

3.2.2 Odor (GMW3205-A-1). Prepare a cured film of sealer that is 3 mm $\pm$ 0.5 mm thick. Cut test specimens from this cured film of material, then condition for seven (7) days at 23 °C $\pm$ 5 °C before initiating test procedure. Evaluate using the wet condition - coding A and volume ratio coding five (5) from Table 1 in GMW3205. The material shall have a tolerable or better odor; minimum rating of six (6).

3.2.3 Fogging (GMW3235-A-Y3-T2 90% Minimum). Prepare a cured film of sealer that is 3 mm $\pm$ 0.5 mm thick. Cut test specimens from this cured film of material, then condition for seven (7) days at 23 °C $\pm$ 5 °C before initiating test procedure. Evaluate using photometric method - method A per GMW3235.

3.2.4 Volatile and Semi-Volatile Organic Compounds (SVOC) from Interior Materials (GMW15634). Prepare a cured film of sealer that is 3 mm $\pm$ 0.5 mm thick. Cut test specimens from this cured film of material, then condition for seven (7) days at 23 °C $\pm$ 5 °C before initiating test procedure. After this conditioning, packaging is done as described for other test materials. Evaluate SVOC using 60 minutes at 120 °C per 4.2.2.1 of GMW15634.

3.2.5 Volatile Organic Compound (VOC) Determination (EPA Method 24, see 2.2 using ASTM D2369 Procedure B). Target is 35.9 kg/m³ (0.3 lb/gal) or less. However, the final VOC of the product, including all weights, calculations and runs are to be identified and reported as data in the submission book.

3.2.6 Aldehyde and Ketone Emission from Interior Materials (GMW15635). Aldehyde and ketone emissions shall be determined according to GMW15635. The limiting values are (see 3.2.6.1 thru 3.2.6.3):

3.2.6.1 Formaldehyde: 10 µg/g, maximum

3.2.6.2 Acetaldehyde: 10 µg/g, maximum

3.2.6.3 Amount of All Aldehyde: 20 µg/g, maximum

3.2.7 Viscosity. While it is not possible to measure the viscosity of the mixed material, due to rate of cure, the viscosity of each of the components shall be determined using the following three (3) methods, see 3.2.7.1 thru 3.2.7.3.

3.2.7.1 Pressflow Viscosity (SAE J1524).

- a. Orifice: 1.32 mm
- b. Pressure: 414 kPa (60 psi)
- c. Sample Weight: 20 g
- d. Test Temperature: 25 °C $\pm$ 0.5 °C

3.2.7.1.1 Viscosity Requirements. The Key Product Characteristic (KPC) requirement for pressflow viscosity is measured at 72 h from batch manufacture and shall be:

3.2.7.1.1.1 Part A. Target 72 h viscosity shall be determined at time of approval and held within a $\pm$ 5 s range.

3.2.7.1.1.2 Part B. Target 72 h viscosity shall be determined at time of approval and held within a $\pm$ 5 s range.

3.2.7.1.2 In addition, when stored in proper conditions, the rate at which the viscosity increases with age should not exceed the following guidelines:

3.2.7.1.2.1 Viscosity at 30 days: $\leq$ 72 h value +20%.

3.2.7.1.2.2 Viscosity at 60 days: $\leq$ 72 h value +40%.

3.2.7.1.2.3 Viscosity at 90 days: $\leq$ 72 h value +60%.

Note: This is using the 72 h value as the baseline.

3.2.7.1.3 The initial and aging viscosity data shall be provided in both numerical and graphed format in the material submission book.

3.2.7.2 Brookfield Viscosity (ASTM D2196).

- a. Spindle Size: Number Seven (7)
- b. Rotation Speed: 20 rpm
- c. Rotation Time to Viscosity Reading: 1 minute
- d. Test Temperature: 25 °C $\pm$ 0.5 °C

3.2.7.2.1 Viscosity Requirements. The Key Product Characteristic (KPC) requirement for Brookfield Viscosity is measured at 72 h from batch manufacture and shall be: