



## **Adhesive, Hot Melt, Weatherstrip, Sealer**

### **1 Scope**

This specification covers the physical properties and performance requirements of an adhesive/sealer which will affect a moisture and dust seal when located inside a weatherstrip obtained from an outside source and assembled during body assembly operations.

**1.1 Material Description.** The adhesive/sealer shall be neutral in color, homogeneous and free of lumps or air bubbles, completely resistant to moisture, have good adhesion to rubber weatherstrips, basecoat/clearcoat paint systems, and have good aging properties. The material may exhibit stringiness during assembly operations.

This system shall be compatible with production systems.

**1.2 Symbols.** Not applicable.

**1.3 Applicability.** Typical applications include mastic in base of weatherstrips.

### **2 References**

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

#### **2.1 External Standards/Specifications.**

ASTM D1875                      ASTM D4339                      SAE J1524

#### **2.2 GM Standards/Specifications.**

GM9899P                      GMW3059                      GMW15735

#### **2.3 Additional References.**

Environmental Protection Agency (EPA) Test Method 24

### **3 Requirements**

**3.1 Toxicity.** The toxicity shall be disclosed in kind and magnitude, as required, by the GM Material Safety Data Sheet (MSDS). In addition, the material must have full approval of the appropriate medical department prior to production use.

**3.2. Odor (ASTM D4339).** The material shall not have a noxious odor in solid, heated or cured condition.

**3.3 Stability (GMW15735).** Material conditioned using potential storage conditions must be capable of passing all the requirements of this specification. Test per GMW15735.

**3.3.1 Elevated Temperature Stability (GMW15735).** As shipped, the adhesive must be capable of withstanding a temperature of 55 °C for 72 h without separation or caking. Test per GMW15735.

**3.3.2 Low Temperature Stability (GMW15735).** As shipped, the adhesive must be capable of withstanding 3 cycles of the applicable cycle schedule outlined in GMW15735.

**3.3.3 Storage Stability.** The shelf life of the adhesive in closed containers shall be 180 days at a temperature not exceed 35 °C. Shelf life of the material commences upon the receipt of the material from the manufacturer.

**3.4 Solids Content (Environmental Protection Agency (EPA) Test Method 24).** The solids content shall be 97% minimum when tested per EPA Test Method 24.

**3.5 Viscosity (SAE J1524).** Test per SAE J1524, Thermoset 29 spindle, 20 rpm, 121 °C or 177 °C. The viscosity tolerance for any one supplier shall be  $\pm 15$  Pa•s based on the recorded viscosity of the original approved production sample.

**3.6 Density (ASTM D1875).** Density of the material shall be reported when tested per ASTM D1875.

**3.7 Sample Conditioning.** All test weatherstrips shall be conditioned prior to test as follows:

**3.7.1** Allow 24 h air cure @ 25 °C and 40% ± 10% relative humidity (RH).

**3.7.2** Expose to 16 h @ 54 °C.

**3.7.3** Cool to room temperature.

**3.8 Water and Solvent Resistance.** There shall be no excessive breakdown of sealer and no washout of filler while using water and Varnish Makers & Painters (VM&P) naphtha. There shall be no absorption of water in the material.

**3.8.1 Procedure.** Place a globular drop of sealer (approximately 13 mm in diameter) in each of two 60 mL open-mouthed bottles. Add 20 mL of water into each of the bottles, then place in an oven at 70 °C ± 2 °C for 30 ± 1 minutes. Remove from oven and shake the hot mixture 10 times to test the water solubility. After shaking, add 10 mL of high flash VM&P naphtha to one bottle and 10 mL of emulsified mineral spirits to the other. Shake the mixture again 10 times. Examine the contents after the third, sixth, and tenth shakes for wash out of binders and fillers.

**3.9 Effect of Aging.** The adhesive and cohesive properties shall not be adversely affected by 14 days at 70 °C aging. The material shall not dry out, bleed oil from cracks, shrink, strain or expand. After the aging test, the sealer must have good adhesion to painted panel and the rubber channel. Actual parts and painted panels (100 mm long) shall be tested in simulated assemblies.

**3.9.1** Apply two 6.4 mm beads, two 9.7 mm beads and one 3.2 mm thick flat smear of sealer onto two topcoated painted steel panels. Press rubber strips into one of the 6.4 mm beads and into one of the 9.7 mm beads on each panel. Age one panel for 14 days at 70 °C in a vertical position with beads running horizontal. Bake the other panel for 72 h at 93 °C. After aging, examine the sealer on both panels for adhesion, cohesion, drying, cracks, shrinkage, and expansion.

**3.9.2** Apply two 6.4 mm beads, two 9.7 mm beads and one 3.2 mm thick flat smear of sealer onto two glass plates. Press rubber strips into one of the 6.4 mm beads and into one of the 9.7 mm beads on each plate. Age one plate for 14 days at 70 °C in a vertical position with beads running horizontal. Bake the other plate for 72 h at 93 °C. After aging, examine the sealer on both panels for adhesion, cohesion, drying, cracks, shrinkage, and expansion.

**3.9.3** Fill a 60 mL ointment can with test material. Level off the top with a straight edge and expose the sealer to 93 °C for 72 h. Remove from heat and allow to cool to room temperature. Inspect for drying, cracking, shrinkage, and expansion.

**3.10 Expansion and Oil Separation.** Fill a 60 mL ointment can slightly in excess of capacity with the sealer. Apply the lid, taking care that the sealer seals off the 6.4 mm hole so as to prevent the free escape of solvent. Place the can in a fixture that will prevent the expanding sealer from forcing the lid off the can and expose to 60 °C ± 2 °C for 16 h ± 0.1 h. Note the length of the bead of sealer forced through the hole as the amount of expansion. Note any oil stain on the paper face of the lid, as well as any deposits of oil on the lid and any oil flowing out around the edge of the lid. No oil bleed and no expansion of more than 25.4 mm through 6.4 mm hole in lid is permissible.

**3.11 Insertion (GM9899P).** The weatherstrip with its applied sealer shall have the capability of being properly installed and affect a seal upon the application of a load not excessive to that required to install the weatherstrip without sealer.

**3.11.1** The test shall apply to the part in the as-received condition and after stability tests.

**3.11.2** Sealer is to be tested at four temperature ranges and shall not exceed the maximum allowable insertion value. The values are listed in Table 1.

**Table 1: Test Temperatures and Insertion Values**

| Temperature | Insertion Values |
|-------------|------------------|
| 38 °C       | 6 N              |
| 21 °C       | 8 N              |
| 4 °C        | 14 N             |
| -18 °C      | 28 N             |