



ENGINEERING STANDARDS

Material Specification

LIMITED USE
HN2116

Sealer - Plastisol -Exterior - Enamel Do Not Use on New Programs; No Replacement

1. GENERAL DESCRIPTION

This specification covers a plastisol type sealer, capable of being applied directly over ELPO primed surfaces, and intended for sealing body joints. It is used under exterior enamel painted surfaces.

The sealer shall be a contrasting colour to ELPO primer. It shall be smooth, homogeneous, and free from lumps and unmixed particles. It shall be compatible with wet primer surface and GM Holden enamel paint systems. It shall cure in the primer surfacer oven into a tough, resilient seal.

The sealer must be capable of being applied by extrusion gun or airless spray. It must also be capable of accepting up to 50% air by volume when used in conjunction with the Nordson Foam Mix System.

The applied bead may be brushed where necessary and should be removable with a dry cloth.

2. DETAILED REQUIREMENTS

2.1 Odour

The sealer must not be toxic or noxious. After curing it must be relatively non-odorous.

2.2 Stability

The shelf life of the material shall be 90 days at a temperature not to exceed 35° C. Shelf life of material commences upon receipt of the material at the assembly plant. Material at the end of this period must be capable of passing all the applicable requirements of this specification except viscosity which shall be a maximum of 60 seconds when tested as in clause 2.4.

2.3 Solids Content

93.0% by weight minimum

2.4 Viscosity by Extruding Method

Extrude 100g of material at 276kPa through a 1.32mm diameter x 13.5mm long orifice at 25° C. Release viscosity to be 60 - 70 seconds.

2.5 Sag

5 mm max.

Test Method - Apply a bead of material 4.8 mm x 4.8 mm x 178 mm (3/16" x 3/16" x 7") with a scraper to a 250 mm x 250 mm (10" x 10") primed panel. Set the test panel in the vertical position with the bead horizontal, air dry for 20 minutes. Bake the panel in the air dry position at 145° C $\pm$ 5° C for 30 minutes and measure the sag. Sag is the total width of the bead minus the width of the original bead.

2.6 Viscosity and Yield Stress (Sag) by Rheometer Method

Release viscosity at 131 s⁻¹ to be 57-63 Poise and release Bingham Yield stress 400-460 Pa.

Test Method

Use a Physica MCR 300 rheometer fitted with CP-50-1 measuring system and a TEK 150P-C measuring cell. Run a rotational measuring profile as specified below. Set temperature constant at 25°C and set measuring position at 0.05 mm. Record the viscosity at 131 s⁻¹ in Poise from the value measured in the final measuring point of interval 3. Calculated yield stress in Pa according to the Bingham rheological model with RS100/120 compatible error weighting using the shear stress and shear rate data for all data points in interval 4.

Measuring profile

Interval 1 – shear rate of zero for 2 minutes 18 seconds

Interval 2 – shear rate to increase in a linear ramp from 5 – 131 s⁻¹ over a time period of exactly 3 minutes; 30 measuring points to be recorded with 4.2s⁻¹ shear-rate intervals.

Interval 3 – Constant shear rate of 131 s⁻¹ over a time period of 3 minutes 20 seconds, 10 measuring points to be recorded at 20 seconds intervals

Interval 4 – shear rate to reduce in a linear ramp from 131 – 5 s⁻¹ over a time period of exactly 3 minutes; 30 measuring points to be recorded with 4.2s⁻¹ shear-rate intervals.

2.7 Coefficient of Expansion

Volume change during cure +5% to -10%.

Not applicable when used in conjunction with Nordson Foam Mix equipment.

Test Method - Use Aluminium coupons approximately 75 mm x 25 mm. Extrude an approximate 6 mm diameter bead of material on to the coupon. Calculate the volume of the sealer V1, by weighing in air and water. Cure the sealer by baking in an oven for 30 minutes at 145° C ± 5°C. Calculate the volume of the cured sealer V2, by weighing in air and water.

$$\text{Per cent Expansion} = \frac{V2 - V1}{V1} \times 100$$

2.8 Pressure Stability

The sealer must be capable of withstanding pumping pressure without adversely affecting the viscosity of the sealer.

Material shall not cake or separate oil under pressure.

2.9 Characteristics of Cured Sealer

The material must adhere to primed steel and be paintable with GM Holden current production enamel. It must have no plasticiser migration stain, and must not cause enamel cracking, or lose adhesion during and after the following environments:

14 days S-1 Sunlamp

14 days ageing at 70° C

6 months outdoor exposure at Townsville

GM Corrosion Cycle (HN 0127)

GM Cracking Cycle (HN 0127)

7 days humidity (38° C, 100% R.H.)

Panel Preparation - A 200 mm x 6 mm x 2 mm bead of sealer is applied to a 250 mm x 250 mm steel panel that has been coated with ELPO primer and baked. The panel and applied sealer is then sprayed with GM Holden current production enamel primer surfacer and baked at 145° C for 1 hour. The panel is then sprayed with 2 coats of GM Holden current production top coat and baked at 145° C for 30 minutes.