



COATING, POLYVINYL CHLORIDE (PVC), SPRAYABLE, PRIMER OVEN CURING, CHIP RESISTANT, IMPROVED PAINTABILITY

WSS-M4G318-A

1. SCOPE

The material defined by this specification is a solvent release, heat curing, stone peck resistant PVC coating for exterior body areas.

2. APPLICATION

This specification was released originally for material used as a stone peck protective coating over baked electrocoat on the lower body side of passenger cars & trucks and cures during the body spray primer bake cycle. The material is compatible in paint process and can be applied by airless spray in a wet film thickness of 200 - 500 micrometer with or without pre-gelling prior to spray primer application.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS

Material suppliers and part producers must conform to the Company's Standard Requirements Materials (WSS-M99P1111-A).

Part producers using this material in their products, must use Ford approved materials and must conform to a process control plan, which has been approved by STA and/or the relevant Materials Activity.

3.2 TEST PANEL PREPARATION

3.2.1 Use 300 x 100 x 0.8 - 0.9 mm E-coated test panels according to FLTM BI 120-01. The sealer must be applied on the cured E-coated test panel within 30 minutes after oven curing.

3.2.2 Use paint-materials and curing conditions according to FLTM BV 150-05 (for each individual region)

3.3 RHEOLOGY

Suppliers must submit flow characterization data to Ford Motor Company for flow modeling and process window determination. For a specified temperature range, the requested properties include, but are not limited to, viscosity, yield stress, apparent activation energy for viscosity and apparent activation energy for yield stress. This data constitutes the reference standard and shall be kept on file at the designated material laboratory.

3.4 **SOLIDS** 92% min
(FLTM BV 150-10)

3.5 **ASH** 28% max
(FLTM BV 150-10)

Date	Action	Revisions	Rev. 3
2018 02 26	Revised	See Summary of Revisions	M. Jones, NA
2013 05 17	Revised	See Summary of Revisions	W. Janitschke, EU
2009 12 10	Activated		W. Janitschke, EU



3.6 DENSITY at 23 °C 1.50 kg/L max
(ASTM D 1475)

3.7 VISCOSITY at 23 °C
(Rotational Rheometer i.e. Bohlin or equivalent)
Tempering Time: 300 s Pause Interval: 180 s at 131 1/s
Downward Measure: 131 1/s - 20 1/s in 120 s (30 Measure Points)

		Viscosity (Pa·s)	Yield Point (Pa)
3.7.1	As received	1.00 - 1.30	140 - 150
3.7.2	After Aging (336 h at 30 +/- 2 °C)	1.35 - 1.45	100 - 140

Alternative Method:

(SAE J 1524, VIS-2, 1.32 mm orifice, 280 kPa)

Final approval of a specific material viscosity for production shipments shall be made by the affected manufacturing activity. In all cases, the viscosity shall be within process limits as identified on the material control plan.

The viscosity tolerance for any one supplier shall be +/- 10 %, based on the recorded viscosity of the original approved production sample.

3.7.3 As Received +/- 10%
(Conditioning Method A)

3.7.4 Aged 80 s max
(Material aged in closed container for 72 h at 40 +/- 1 °C, conditioning Method A)

3.7.5 90 Day Storage Stability at 23 +/- 2 °C and 32 +/- 2 °C

The supplier shall provide a viscosity profile versus time from initial through 90 days storage at 23 +/- 2 °C and 32 +/- 2 °C. Measurements shall be taken at weekly intervals. Curves shall be made available to Materials Engineering prior to addition on the Approved Source List.

Note: Report the test method used.

3.8 SURFACE CONDITION AFTER AGING
(120 h at 80 +/- 2 °C)

After curing the material shall be dry to the touch after cooling to 23 +/- 2 °C. It shall be free from cracks or bubbles and shall show a uniform paint film without staining or discoloration. After bending 90° around a mandrel of 100 mm diameter within 2 s (see FLTM BV 153-04) there shall be no evidence of chipping or loss of adhesion between the various layers.



Panel-Preparation:

- Test panels (para 3.2.1) shall be coated with the material in such a manner, that after curing a dry coating thickness of 200 + 500 micrometer is obtained.
- After 10 minutes at 23 +/- 2 °C, coat specimens wet on wet with spray primer. Cure specimens separately with min. and max. curing cycle (see para 3.2.2)
- After 10 minutes at 23 +/- 2 °C, spray separate specimens with light colored standard and metallic base/clearcoat. Cure specimens separately with min. and max. curing cycle (see para 3.2.2)

Test-Method:

- Condition for 2 h at 23 +/- 2 °C and expose in mechanical convection oven maintained at 80 +/- 2 °C for 120 h.
- Test and examine after 24 h at 23 +/- 2 °C.

3.9 FLEXIBILITY AFTER AGING (only E-Coat/Sealer)
(FLTM BV 153-02, Method C, except test panels
per para 3.2.1, dry coating thickness 200
+ 500 micrometer, mandrel diameter 100 mm)

No cracking, chipping
or loss of adhesion

3.10 ADHESION AFTER HEAT AGING (only E-Coat/Sealer)
(FLTM BV 153-03, Method B, except test panels
per para 3.2.1, dry coating thickness
200 + 500 micrometer, 14 d aging at 80 +/- 2 °C,
2 h at 23 +/- 2 °C, mandrel diameter 100 mm)

No cracking, chipping
or loss of adhesion

3.11 ADHESION (only E-Coat/Sealer)

The material at all ranges of coating thickness shall not peel off in a coherent film.

Test Method:

- Coat test panels from para 3.2.1 so that after the: (a) min curing cycle, (b) max curing cycle (see para 3.2.2) a dry coating thickness of 500 micrometer, beginning at one edge of the test panel and tapering to zero at the other is obtained.
- After 24 h at 23 +/- 2 °C, make two cuts through the coating along the 300 mm length of the panel and 20 mm apart and try to peel off coating starting at the edge with the lowest film thickness.

3.12 ABRASION RESISTANCE (ASTM D 968)

There shall be no exposed metal area showing after

No loss of adhesion
on and around the
area of stone impact.

- (a) 200 micrometer - 150 L
- (b) 300 micrometer - 250 L and
- (c) 500 micrometer - 370 L gravel impact