PERFORMANCE, ADHESIVE, HEAT CURING, EPOXY/GLASS FIBER LAMINATE, METAL REINFORCEMENT, PAINT SHOP APPLIED — **WSS-M11P64-A1**

PERFORMANCE, ADHESIVE, HEAT CURING, EXPANDABLE, EPOXY/ GLASS FIBER LAMINATE, METAL REINFORCEMENT, BODY SHOP APPLIED — **WSS-M11P64-A2**

PERFORMANCE, ADHESIVE, HEAT CURING, NON EXPANDABLE, EPOXY/GLASS FIBER LAMINATE, METAL REINFORCEMENT, BODY SHOP APPLIED — **WSS-M11P64-A3**

1. SCOPE

These specifications define the performance requirements for a heat curing, epoxy/ fiberglass laminate, supplied in die cut form with a release paper backing.

2. APPLICATION

The materials released to these specifications were originally released to reinforce and stiffen sheet metal body panels.

WSS-M11P64-A1 can be applied to electrocoat primed steel surfaces.

WSS-M11P64-A2/A3 can be applied to oily cold rolled steel and galvanized steel surfaces. Recommended bake schedule per para 4.2.

Materials are required to perform in a number of applications. Each design and/or application has unique requirements. Compliance with this specification does not guarantee that material will function for all potential applications on vehicles. Selection of the appropriate material should therefore be based on jury evaluations or other test procedures as well as required functional trial.

3. REQUIREMENTS

Material specification requirements are to be used for initial qualification of materials.

Tests must be conducted on material having an original epoxy/fiberglass material thickness of 1.27 +/- 0.1 mm.

3.1 APPROVED SOURCES

This specification requires the use of approved sources. Only the sources identified on the Ford Approved Source List (ASL) can be used when this specification is listed on the drawing, CAD file, or other documents. The list of approved sources is located within Ford at www.mats.ford.com or available externally through a Ford Materials Engineer.

3.2 SYSTEM COMPATIBILITY

Initial laminate approval was based on a specific material system which included the substrate, stamping lubricants and laminate. The originally approved material system was oven cured using specific production process parameters. Substrate choice, stamping lubricants, stamping plant processing conditions and assembly plant processing conditions may affect laminate performance. If any of these parameters are changed, the laminate performance must be validated using the new parameters.

Date	Action	Revisions	Rev. 03
2017 09 11	Revised	See Summary of Revisions	J. Herl EU
2017 06 27	Editorial	Corrected footer	A. Collins, NA
2006 05 22	Activated		M. Mehandru

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3.3 FIBERGLASS CLOTH REQUIREMENTS

Thickness of cloth, weave, and breaking strengths in warp and fill directions must be such that all requirements of this specification are met.

3.4 EPOXY POLYMER REQUIREMENTS		A1	A2	A3
3.4.1	Specific Gravity (ASTM D 792)	0.8 - 1.9	0.8 -1.9	0.8 - 1.9
3.4.2	Volume Expansion, % (FLTM BV 108-02, material cure per para 4.3)	N/A	50 - 350	N/A

3.5 UNCURED LAMINATE MATERIAL PROPERTIES

3.5.1 Construction

Construction must consist of woven fiberglass cloth onto an epoxy adhesive film backed with release paper. There must not be any loose glass fibers after the die cut operation.

3.5.2	Thickness, uncured (ASTM D 461, 85 g load, 25 mm diameter foot, total fiberglass and adhesive)	As specified on Engineering Drawing

3.6 UNCURED LAMINATE PERFORMANCE REQUIREMENTS

3.6.1 Formability

The material must not delaminate or crack when folded 180° upon itself.

3.6.2 Tack Adhesion Test

The laminate must not peel at the edges or fall off panel.

Test method:

Apply a 100 x 150 mm adhesive laminate strip on a 150 x 300 mm panel. Prepare four panels for each substrate per para 4.1.

Pass a 2.2 kg roller over samples per ASTM D 1000.

Invert two panels immediately after laminate application and condition at 23 +/- 2 °C for 1 h. Observe for peeling or lifting of laminate from panel.

Save panels for Inverted Bake Test, para 3.7.2.

Stand the remaining two panels vertically immediately after laminate application and condition at 23 +/- 2 °C for 1 h. Observe for peeling, sliding or slumping of laminate from panel.

Save panels for Vertical Bake Test, para 3.7.3.

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3.6.3 Wash Resistance (Not required for A1)
(FLTM BV 116-01, Method "A" & "B")

No evidence of material wash off or displacement due to precleaning or phosphating solutions is permitted in flow phosphate tanks.

3.6.4	Electrocoat Compatibility (Not required for A1) (FLTM BV 119-01, use current production paints as identified by the Materials Engineering Activity)	Must not contaminate electrocoat primer bath or cause film irregularities
3.6.5	Storage Stability	90 days

The material must meet the shelf life requirements when stored in sealed packages (if so recommended by supplier), away from all sources of heat, at temperatures not to exceed 32 °C. Materials in opened packages must be used within 2 weeks.

Critical performance characteristics to evaluate for shelf life stability shall include, but are not limited to, the following:

Tack Adhesion Test para 3.6.2
Flexural Strength Test para 3.7.1.1.

3.6.6 Release Paper Adherence and Removal

The release paper must remain attached to adhesive surface during shipping and handling. It must be easily removed from the adhesive without adhesive separation or paper tear.

3.7 CURED LAMINATE PERFORMANCE REQUIREMENTS

3.7.1 Flexural Strength, min
(ASTM D 790 M, 100 mm constant support span, 6.4 mm radius loading nose, 5 mm/min constant crosshead rate, compression, load applied to substrate surface, 5 samples minimum; preparation specified below)

Sample preparation:

1) Identify the cutting direction for the fiberglass cloth
   - Cut 25 x 150 mm specimens of adhesive laminate in warp and fill directions.
   - For specification testing, cut all laminate specimens in the grain direction producing the highest mean Peak Loads

2) Lubricant application (Not required for A1)
   - Using appropriate method, apply the designated lubricant at the specified amount to substrates described in para 4.1.
   - Allow coupon to sit undisturbed in horizontal position for at least 1 hour prior to use.

3) Preparing bonded assembly
   - Apply a 25 x 150 mm adhesive laminate specimen cut in a specified direction to a 25 x 150 mm panel prepared in Step 2.
   - Pass a 2.2 kg roller per ASTM D 1000 over sample within 15 minutes of patch application.
   - Condition at 23 +/- 2 °C and 50 +/- 5% RH for 1 h prior to oven cure per para 4.2.

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