



ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

PAINT PERFORMANCE, RIGID AND FLEXIBLE
SUBSTRATES, EXTERIOR - SERVICE REFINISH
TOUCH-UP

WSS-M2P100-D

1. SCOPE

This specification defines the performance of a multi-layered paint system required for all exterior rigid body sheet metal, rigid and flexible plastic body parts where best appearance, high flexibility, high durability, and impact resistance are required. This system is specified for assembly plants, component suppliers and refinish repair.

2. APPLICATION

This specification was released originally to define paint performance of exterior surfaces and define the performance requirements for a complete service refinish paint system. It is specified for vehicle bodies, hoods, fenders, vehicle bumpers, claddings, bodyside moldings, and other exterior parts visible after assembly. This specification is applicable to all surfaces outboard of the weather-strip.

3. REQUIREMENTS

Terminating exterior edges visible after assembly shall conform to the full requirements of this specification.

In-department, pre-delivery and refinish paint repairs shall meet the requirements of this specification.

Parts must conform to the requirements defined by the Ford Color Harmony Team. Note: For in process color check the preferred method is SAE J1545, three angle CMC.

3.1 QUALITY SYSTEM REQUIREMENTS

Material suppliers and part producers must conform to Quality System Requirements, QS-9000. Material specification requirements are to be used for initial qualification of materials. A Control Plan for ongoing production verification is required. This plan must be reviewed and approved by the relevant Ford Materials activity and/or Ford Supplier Technical Assistance (STA) prior to production parts submission. Appropriate statistical tools must be used to analyze process/product data and assure consistent processing of the materials.

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1999 05 17	Activated	J. Hughes D. Green

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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 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

Ford Motor Company, at its option, may conduct infrared and/or thermal analysis of material/parts supplied to this specification. The IR spectra and thermograms established for initial approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. All samples shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

3.3 CONDITIONING AND TEST CONDITIONS

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

3.4 SYSTEM COMPONENTS

3.4.1 Substrates

Auto body steel, aluminum, pre-coated or electroplated zinc or zinc alloy coated steel and zinc die casting or as specified on Engineering Documents.

Rigid polymers and rigid polymer blends, SMC, ABS, etc. with a flex modulus typically greater than 1250 MPa.

Flexible polymers and flexible polymer blends, PU, PC, TEO etc. with a flex modulus typically of less than 1250 MPa.

3.4.2 Substrate Condition

The surface to be coated must be cleaned to ensure the absence of oil or alkaline residues, fingerprints, corrosion, mold release agents, dirt, moisture, and other foreign materials.



3.4.3 Coating Material

3.4.3.1 Zinc Phosphate (Metallic Substrates)

Zinc phosphate coating per WSS-M3P1-D for cold rolled steel, pre-coated, electroplated zinc or zinc alloy coated steel and zinc die castings.

Chromium oxide coating per WSK-M6P2-B should be used for aluminum. Zinc phosphate coating per WSS-M3P1-D shall be used if steel and aluminum parts are processed concurrently.

The aluminum tolerance of the process used shall not be exceeded and all requirements of both WSS-M3P1-D and this specification shall be met by both steel and aluminum parts.

3.4.3.2 Cathodic Electrocoat (Metallic Substrates)

Ford Engineering approved current production materials.

3.4.3.3 Primer and Color Coat (All Substrates)

Ford Engineering approved current production materials should be used.

When necessary in order to meet the requirements of this specification, an adhesion promoter and/or primer surfacer must be used as specified on Engineering Documents. Powder, if used, must be applied over zinc phosphate or cathodic e-coat.

3.4.3.4 In-Department and Predelivery Repairs

Repaired areas must meet the requirements of this specification. All repair materials and processes used should be approved by the affected Product Materials Activity. Maximum film thickness and/or number of repairs for repaired parts will be specified in the mutually agreed control plan.



3.4.3.5 Refinish Paint Material Steel/Plastic Panel Prep

3.4.3.5.1 Refinish anti-corrosion primer, primer surfacer, basecoat and clear-coat over sanded zinc phosphated e-coated steel.

Using 100 x 300 mm cold rolled steel test panels which have been zinc phosphated per WSS-M3P1-D, panels shall be coated with OEM current production gray or black cathodic electrocoat primer to achieve a dry film thickness (20 - 23 um). The bake schedule is 10 minutes at 182 C metal temperature. Apply masking tape to divide the panel in half. Scuff sand the upper half panel with a 3M Red Scotchbrite hand pad #7447. Machine sand the lower half with 80 grit sand paper to completely remove the E-coat. Rinse with deionized water to remove sludge and blow off using clean, compressed air. Using a clean lint free cloth, solvent wipe with Xylene WSK-M14J239A or ASTM D3735. The following process will be applied "wet on wet" and final baked. Reduce per manufacturer's label directions and spray refinish anti-corrosion primer to a film thickness of 11 - 19 um min to the sanded lower 1/2 of the panel. Follow manufacturer's recommended flash times.

Reduce per manufacturer's label directions and spray refinish primer surfacer/sealer to a film thickness of 25 um min to the entire panel. Reduce per manufacturer's label directions and spray refinish basecoat to a film thickness of 15 - 38 um min to the entire panel. Reduce per manufacturer's label directions and spray refinish clearcoat material to a film thickness of 51 um min to the entire panel. Bake at 60 C max for 60 minutes ambient temperature.



3.4.3.5.2 Service refinish primer,
basecoat/clearcoat over original
factory finish

Using 100 x 300 mm bare galvanized steel test panels. Using a clean, lint free cloth, solvent wipe with Xylene WSK-M14J239A or ASTM D3735. Panels should be coated with current OEM production gray or black cathodic electrocoat primer, to a dry film thickness of 20 - 23 um, and baked for 10 minutes at 182 C metal temperature. Apply OEM spray primer to a dry film thickness of 25 um, and bake for 10 minutes at 149 C metal temperature. Apply OEM current production basecoat color to a dry film thickness of 15 - 25 um. Apply OEM current production clearcoat to a dry film thickness of 46 - 51 um and bake for 10 minutes at supplier recommended temperature. Apply masking tape to divide the panel in half. The upper half of the panel shall not be scuffed or sanded. Scuff sand the lower half of the panel with a 3M Red Scotchbrite hand pad #7447. Reduce per manufacturer's label direction and spray refinish primer/filler to a film thickness 25 um min. Follow recommended flash times and bake at 60 C max for 10 minutes. Wet sand the refinish primer surfacer with 400 grit paper. Rinse with deionized water to remove sludge and blow off using clean compressed air. Using a clean, lint free cloth, solvent wipe with Xylene WSK-M14J239A or ASTM D3735. Reduce per manufacturer's label directions and spray refinish basecoat to a dry film thickness of 15 - 38 um min. Follow manufacturer's recommended flash times. Reduce per manufacturer's label directions and spray refinish clearcoat to a dry film thickness of 46 - 51 um min. Bake at 60 C max for 60 minutes.



3.4.3.5.3 Service refinish topcoat over original factory finish.

Using 100 x 300 mm cold rolled steel test panels which have been zinc phosphated per WSS-M3P1-D. Panels should be coated with current OEM production gray or black cathodic electrocoat primer, to a dry film thickness of 20 - 23 um, and baked for 10 minutes at 182 C metal temperature. Apply OEM spray primer to a dry film thickness of 25 um, and bake for 10 minutes at 149 C metal temperature. Apply OEM current production basecoat color to a dry film thickness of 15 - 25 um. Apply OEM current production clearcoat to a dry film thickness of 46 - 51 um and bake for 10 minutes at supplier recommended temperature. Using a clean lint free cloth, solvent wipe the with Xylene WSK-M14J239A or ASTM D3735. Apply masking tape to divide the panel in half. Scuff sand the upper half of the panel with a 3M Gray Scotchbrite hand pad #7448. Wet sand per FLTM BI 103-02, the lower half of the panel with 400 grit sand paper to remove clearcoat and some basecoat, to a dry film thickness of 38 - 51 um. Rinse with deionized water to remove sludge and blow off using clean compressed air. Using a clean lint free cloth, solvent wipe with Xylene WSK-M14J239A or ASTM D3735.

Reduce per manufacturer's label directions and spray refinish basecoat material. Apply a dry film thickness of 15 - 38 um. Follow manufacturer's recommended flash time. Reduce per manufacturer's label directions and spray refinish clearcoat to a dry film thickness of 51 um. Bake at 60 C max for 60 minutes.

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- 3.4.3.5.4 Refinish adhesion promoter primer
and basecoat/clearcoat over OEM
conductive primer
(Plastic Service Part Repair)

Using test panels which have been cut out of current production parts coated with OEM current production gray or black conductive primer. Scuff sand the panel with a 3M Red Scotchbrite hand pad #7447. Rinse with deionized water to remove sludge and blow off using clean, compressed air. Using a clean lint free cloth, solvent wipe with alcohol. The following process will be applied "wet on wet" and final baked. Reduce per manufacturer's label directions and spray refinish adhesion promoter primer. Include flex agents as necessary. Follow manufacturer's recommended flash times. Reduce per manufacturer's label directions and spray refinish basecoat material. Apply a dry film thickness of 15 - 38 um. Reduce per manufacturer's label directions and spray refinish clearcoat to a dry film thickness of 51 um. Bake at 60 C max for 60 minutes.

- 3.4.3.5.5 Service refinish primer,
basecoat/ clearcoat over original
factory finish
(Plastic BC imperfection repair)

Using test panels which have been cut out of current production parts coated with current OEM production paint system containing conductive electrocoat primer, basecoat color, and clear-coat. Wet sand per FLTM BI 103-02. Rinse with deionized water to remove sludge and blow off using clean compressed air. Using a clean, lint free cloth, solvent wipe with alcohol. Reduce per manufacturer's label direction and spray refinish adhesion promoter primer. Reduce per manufacturer's label directions and spray primer surfacer. Bake at 60 C at manufacturers recommended time. After cooling block sand with 400 grit paper. Rinse with deionized water to remove sludge and blow off with compressed air. Using a clean, lint free cloth, solvent wipe with alcohol. Reduce per manufacturer's label directions and spray refinish basecoat material 15-38um. Follow manufacturer's recommended flash times. Reduce per label directions and spray clearcoat to 51 um. Include flex agents as necessary. Bake at 60 C max. for 60 minutes.