



PAINT PERFORMANCE, PLASTIC SUBSTRATES, INTERIOR

WSS-M2P188-B1

1. SCOPE

This specification defines the performance requirements for decorative coatings including paint, soft coating paint, and interior scratch resistant coatings on plastic substrates for interior use.

2. APPLICATION

This specification was released originally to define paint performance requirements for various painted interior applications such as rigid instrument panels, console, center finish panel, bezels, switches, glove box lids, pillar coverings, etc.

3. REQUIREMENTS

The paint materials must be selected from the Painted Parts Strategy List using paints from suppliers on the Ford Approved Source List (ASL), unless a waiver is granted by Materials Engineering. All parts must also meet the appropriate DVP & R and Subsystem Design Specification requirements. This specification is not for flexible cover stock instrument panels (WSS-M15P45-B). For Pad printing applications see WSS-M2P158-A1. All paint applicators must meet the Interior Parts Painter Approval Process (WSS-M2P195-A) unless waived by Materials Engineering.

All parts of the component that are visible after vehicle assembly, including terminating edges shall conform to the full requirements of this specification unless approved by Materials and Design Engineering.

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

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

3.2 SYSTEM COMPONENTS

3.2.1 Test Specimens

Tests shall be performed on actual components processed through the production process. Where this is not possible, plaques can be used as noted in the specification and approved by Materials Engineering. These shall be the same substrate processed in the same manner as production components. See Table 1 for testing requirements & sample size.

Design Verification Testing (DV) is done on plaques by the paint supplier and is covered in the applicable Paint Material Specification, as noted in 3.2.6.

Product/Process Validation Testing (PV) is done on production painted parts as defined in Table 1.

When plaques are used as a substitute for actual components, this must be clearly reported on the PSW or the laboratory test report.

Date	Action	Revisions	Rev. 2
2017 12 01	Revision	See Summary of revisions	J. Bilko NA
2015 01 16	Revision	Edit Table 1	J. Bilko NA
2014 10 20	Released		J. Bilko NA



3.2.2 Substrate

ABS, PC, PC/ABS, PP, TPO, PA or as specified on the Engineering Document.

3.2.3 Plastic Preparation

The surface to be painted shall be cleaned by an acceptable process,(e.g. power wash) to remove mold releasing agents, fingerprints, oils, dirt and moisture.

3.2.4 Primer

When necessary in order to meet the requirements of this specification, an adhesion promoter, primer surfacer or sealer may be needed. Surface enhancements, such as flaming or plasma treatment that modify surface tension, surface conductivity may also be required in order to meet the requirements. This must be noted in the initial submission package and noted on the drawing.

3.2.5 Top Coat

Suitable to meet the requirements of this specification or as specified on the Engineering Document. Topcoat systems may also be applied to meet the requirements of this specification. This must be noted in the initial submission package.

3.2.6 Film Thickness

(ASTM B487, BI 170-01 or other mutually agreed upon method)
Per paint material specifications, the film thickness range is:

Solid Color Monocoat (1-layer) paint systems (WSS-M99J385-A1/A2, WSS-M15J14-A1)	20 – 30 micrometers
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Metallic Colors – Monocoat (1-layer) paint systems (WSS-M15J14-A2)	25 – 35 micrometers
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Basecoat/Clearcoat (2-layer) paint systems (WSS-M15J16-A1/A2, WSS-M15J17-A1/A2)	Basecoat Clear coat	15 – 30 micrometers 25 – 40 micrometers
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Soft Touch Monocoat (1 layer) Paint Systems (WSS-M15J15-A1/A2)	45 – 55 micrometers
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Note: These ranges are considered to be requirements unless otherwise supported by testing data agreed to by Materials Engineering.

The film thickness shall be measured on the (grained) production part using the above requirements. The film thickness of all test specimens shall be reported on the PSW and laboratory report.



3.2.7 Ageing

Test panels or test specimens prepared for investigations according to this specification must be aged for at least 72 hours at 23 +/- 2 °C or 16 hours at 45 +/- 1 °C prior to testing.

3.2.8 Production Paint Repair

Repaired parts must also meet all the requirements of this specification. All repair materials and processes used must be approved by the affected Product Engineering Office/Materials Engineering. Maximum film thickness and maximum number of repairs will be specified in a mutually agreed control plan. Repairs are not allowed on parts painted with metallic paint and soft touch paint.

3.2.9 Cure Profile

A temperature part profile curve (Time/Temp) from the production process for the part must be included in the PPAP.

3.3 APPEARANCE

Color, gloss, grain, tactile effect and surface finish shall match master Trim Sample and/or Master Appearance Sample as approved by Corporate Design.

The coating shall exhibit no craters, pinholes, solvent popping, seediness, abnormal roughness, excessive flow or any other detrimental defect.

3.3.1 Color (FLTM BI 109-01, Visual Assessment and/or SAE J1545, MA58 Three-Angle CMC)

Shall match the Master Approved Sample.

3.3.2 Gloss (FLTM BI 110-01, ASTM D523)

As released by Engineering:

Gloss	A:	20° Glossmeter	min 92
	B:	60° Glossmeter	76 - 84
	C:	60° Glossmeter	66 - 74
	D:	60° Glossmeter	58 - 66
	E:	60° Glossmeter	47 - 53
	F:	60° Glossmeter	32 - 38
	G:	60° Glossmeter	17 - 23
	H:	60° Glossmeter	7 - 13
	J:	60° Glossmeter	4 - 6
	K:	60° Glossmeter	2 - 4
	L:	60° Glossmeter	0.5 - 2.0
	N:	60° Glossmeter	1.8 - 2.4
	R:	60° Glossmeter	1.2 - 2.0

The color, pattern and finish shall match the approved Design Center master sample, or shall be as specified on the Engineering Document.

Note: Obtaining an accurate gloss reading should be done on a smooth flat surface or non-grained part.



3.4 RESISTANCE PROPERTIES

3.4.1 Adhesion

Lightly hand sand paint film surface (10 double rubs, moderate pressure) with P600 paper until dull, before knife operation and checking adhesion. Clean film surface with 50/50 mixture IPA/water before testing.

3.4.1.1	Flexible Substrates, Flex Modulus <450MPa and Soft Feel Paint WSS-M15J15-A1/A2, (FLTM BI 106-01, Method D, knife)	5 % max No complete Diamond removed
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3.4.1.2	Rigid Substrates (FLTM BI 106-01, Method B, knife)	Grade 0 max
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3.4.2	Water Resistance (FLTM BI 104-01, 96 h)	No blistering, softening
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After exposure, adhesion shall be tested according to para 3.4.1 within 30 minutes of removal from water on all paint systems.

Water based paints shall recover completely for blistering and softening within 24 hours after removal from the water.

3.4.3	Abrasion Resistance, (SAE J948, Taber method, 500 g load, CS-10 wheels)	The paint film shall show no abrasion through to the substrate
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Abrasion resistance shall be determined on test panels with smooth surface. Paint must be sprayed on panels of contrasting color (ex. black paint on gray substrate) to improve judgment of wear to the substrate. Measure and report the sample's paint film thickness.

For paint film thickness less than or equal to 25 micrometers run 1000 cycles.

For paint film thickness greater than 25 micrometers use the following formula to calculate the number of cycles to run.

$$\text{Number of cycles} = \frac{(X\mu\text{m})(1000)}{25\mu\text{m}} \quad \text{Where } X\mu\text{m} = \text{paint thickness}$$

3.4.4 Impact Resistance – Room Temperature (23 +/- °C)

Required for scuff plates, floor consoles, load floors, seating components, door map pockets or any other parts as required by Ford Engineering.

3.4.4.1 Rubber Ball
4.5 kg weight, 127 mm dia, 60 +/- 5 Durometer "A"

Test Method: Conduct this test with the trim assembly mounted on an actual or simulated production support foundation using approved retention methods. Drop the rubber ball from the height specified below at the impact locations indicated on the Engineering Drawing.