



EXTERIOR PLASTIC PERFORMANCE, MOLD-IN-COLOR

WSS-M98P13-E

1. SCOPE

This specification defines the minimum durability and performance requirements of exterior mold-in-color plastic components.

2. APPLICATION

This specification was released originally for exterior unpainted molded in color plastic components used in exterior subsystems including, but not exclusive to, outside rearview mirror, cowl grilles and leaf screens, bumpers, radiator grilles, door handles, wipers, pick-up box liners/moldings, and exterior ornamentation. Typical methods of manufacture include injection molding, blow molding, and extrusion.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification is performance based and does not have approved sources.

3.1.1 Materials used in all exterior systems shall withstand the assembly plant paint repair process (or be protected with shielding, etc.) without deformation, functional damage or loss of appearance or other specified physical characteristics.

3.1.2 The color/pigment loading, grain, and material of the part influences scratch performance and cleanability. Materials Engineering recommends avoiding highly geometric grains or grains with sharp edges. Reference paragraph 3.5.3.

3.1.3 The UV/process/heat stabilizers must be in the base resin from the material supplier, specifically for mold-in-color applications at the press.

3.1.4 All painted exterior components shall meet the requirements of WSS-M2P180-D or latest for rigid substrates and WSS-M2P181-C or latest for flexible substrates.

3.1.5 All electroplated exterior components shall meet the requirements of WSS-M1P83-E2 or latest.

3.1.6 All exterior lighting components shall meet the requirements of WSS-M98P10-B or latest.

3.2 FINISHED PARTS

Unless otherwise indicated, testing must be done on actual production parts or a section of the part whenever possible. Where part dimensions limit equipment access, representative panels or plaques may be substituted for production parts.

Testing must be conducted at Design Verification (DV) and Product Validation (PV) per Table 1.0, unless otherwise agreed to by Ford Materials Engineering.

Date	Action	Revisions	Rev. 2
2018 04 13	Editorial	See Summary of Revisions	K. Mueller, NA
2016 05 19	Revised	See Summary of Revisions	K. Mueller, NA
2015 02 03	Released		K. Mueller, NA





3.3 APPEARANCE

The color, gloss, and finish shall match the Master Appearance Sample as approved by the Design Department or shall be as specified on the engineering drawing.

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

Shall match the Master Approved Sample color panel or the initial sample as approved by Design Center.

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

As released by Engineering:

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	33 - 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

Shall match the Master Approved Sample color panel or the initial sample as approved by Design Center.

- 3.3.3 Mold Flow Analysis must be evaluated to validate minimization of knit/weld lines and appearance issues due to tool conditions and processing.

3.4 HEAT AGING

- 3.4.1 Heat Aging – Horizontal Parts or Parts Above Belt Line
(A, B, C, D Pillar Appliqués, Roof Rack, Cowl Vent Grille, Fixed Running Boards, Step Pads, etc.)

Test Procedure: The production level part must be tested. Expose the test sample to 92 +/- 2 °C in a mechanical convection oven for 16 h. After heat exposure, allow samples to cool to 23 +/- 2 °C for a minimum of 1 hour prior to evaluation.

Acceptance Criteria: Unless otherwise noted, the tested part shall show no color change in excess of Grey Scale rating 4 (AATCC Evaluation Procedure 1/ISO 105-A02) when compared with the original part. (A color tone shift to the yellow direction is allowed up to Grey Scale rating 4. No other tone change (e.g. pink) is allowed.) No visible cracks, blisters, softening, dulling, or evidence of material degradation when observed with the unaided eye from a distance of 300 +/- 30 mm.



3.4.2 Heat Aging – Vertical Parts or Parts Below Belt Line (Bodyside Molding, Rocker Molding, Wheel-lip Molding, etc.)

Test Procedure: The production level part must be tested. Expose the test sample to 82 +/- 2 °C in a mechanical convection oven for 16 h. After heat exposure, allow samples to cool to 23 +/- 2 °C for a minimum of 1 hour prior to evaluation.

Acceptance Criteria: Unless otherwise noted, the tested part shall show no color change in excess of Grey Scale rating 4 (AATCC Evaluation Procedure 1/ISO 105-A02) when compared with the original part. (A color tone shift to the yellow direction is allowed up to Grey Scale rating 4. No other tone change (e.g. pink) is allowed.) No visible cracks, blisters, softening, dulling, or evidence of material degradation when observed with the unaided eye from a distance of 300 +/- 30 mm.

3.5 RESISTANCE PROPERTIES

3.5.1 Resistance to Cold Impact, *Bumper Cover / Fascia Only*

The bumper cover / fascia material must be selected from the bumpers subsystem material strategies and comply with cold temperature requirements which are both located in EKB:

<https://www.edms.ford.com/webtop/drl/objectId/0900cad9812b92f8>

For exceptions, contact Lead Engineering Vehicle Activity.



3.5.2 Weathering Resistance
(ASTM D7869, ISO 105-A02/AATCC Evaluation Procedure 1)

Type	ASTM D7869 (preferred)	SAE J2527 Boro/Boro	Requirements
New Color	2250 h	3000 h	Fade Resistance: Rating 4 min There shall be no cracking, crazing, dulling, or other deterioration A&B Gloss Materials: Gloss Change 25% max (FLTM BI 110-01)
*New Material Supplier or New Material Grade	2250 h	3000 h	Fade Resistance: Rating 4 min There shall be no cracking, crazing, dulling, or other deterioration A&B Gloss Materials: Gloss Change 25% max (FLTM BI 110-01)
	3000 h and 3750 h	4000 h, 5000 h, and 6000 h	Fade Resistance: Report Only Report any cracking, crazing, dulling, or other deterioration A&B Gloss Materials: Report Gloss Change (FLTM BI 110-01)

*New Material Supplier or New Material Grade: New resin from unknown or known Material Supplier. New Manufacturing Locations (new GSDB) for previously approved materials and existing colors are not required to test exterior weathering.

3.5.3 Resistance to Scratching
(FLTM BO 162-01, 1.0 +/- 0.1 mm steel ball at 7.0 N, 6.0 N, 4.5 N, 3.0 N and 2.0 N)

Grained sample cut from production part

Load: 2N

Scratch:

Marring:

Rating 2 max

Rating 2 max

Load: 7N

Whitening/Color Change:

Rating 1 max



Documents

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