GM	WORLDWIDE ENGINEERING STANDARDS	Material Specification	GMW15521

Interior Paint for Polyurethanes

1 Scope

1.1 Material Description. The requirements listed in this specification must be met by all interior paint systems used in all GM vehicle interiors. Paint systems must follow the steps in Figure 1 to complete the paint approval process of a part.

Figure 1: Paint Approval Process of a Part

Note: APOPS = Approved Paint on Parts.

1.2 Symbols.

1.2.1 Paint Haptics. For a paint material approval, the paint system is required to be listed as approved in the GM Materials File (MATSPC) system. Paint systems approved to this specification shall be required to carry a type suffix to indicate the haptic feel that it has to the human skin. The suffix system shall be:

- Type C: Hard Touch

1.2.2 Basecoat/Clearcoat (BC) Applications. Basecoat plus clearcoat systems approved to this specification shall be approved with the symbol (BC) following the haptic suffix.

1.3 Applicability. This specification covers requirements for an interior, waterborne or solventborne, one (1) or two (2) component paint system for use on parts made of paintable polyurethane. All substrates must be tested per GMW16172 to confirm paintability.

1.4 Remarks. It is strongly recommended that paints approved to this specification are direct adhesion to polyurethanes. However, in some limited applications, polyurethane substrates can be pretreated by using a primer. All new colors must be evaluated per Table 1, Column 2.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ISO 105-A02	ISO 2808	ISO 20433

2.2 GM Standards/Specifications.

GMW3059	GMW14162	GMW14729	GMW16172
GMW3208	GMW14334	GMW14797	GMW16853
GMW3221	GMW14445	GMW14829	
GMW3417	GMW14698	GMW15891	

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2.3 Additional References.

2.3.1 Cleaners.

- Ammoniated Window Cleaner (North America)
- Armor-All (North America)
- Armor-All Protectant (North America)
- Fantastik (North America)
- Formula 409 (North America)
- Sonax Interior Cleaner 321200 (Europe)
- Sonax Stain Remover 653200 (Europe)
- Sonax Window Cleaner 338241 (Europe)

3 Requirements

3.1 Sample Conditioning. All samples are to be conditioned prior to each requirement test to GMW3221, Code B. Painted samples shall be subjected to all testing after a minimum aging period of 72 h following the baking or drying cycle.

3.2 Paint System Requirements. The paint system tested on the panels must be identical to the production intent paint system.

3.3 Sample Preparation and Identification. The plastic substrates and paint system shall be identified per 3.3.1 and 3.3.2.

3.3.1 Plastic Substrates. Use only substrates as defined in Table 1.

- Vendor
- Compound number

3.3.2 Paint System.

- Vendor
- Primer name (if applicable)
- Paint formulation
- Processing conditions, including all reduction parameters, surface preparation, flash and cure times and temperatures and dry film thickness for each film of paint applied

3.4 Testing. Perform all testing as indicated in Table 1 and Table 2.

3.4.1 GM Confirmation Testing. For all Table 1, Column 1 Material Approvals (in addition to 3.4), three (3) panels per combination listed in Table 1 must be submitted for sunscreen and insect repellent resistance testing to be performed by GM Materials Engineering.

3.4.2 Test Report. Use the appropriate table in Appendix A, Tables A1, A2 and/or A3 to record all test results.

Table 1: Required Testing Combinations

	Purpose:	**Combinations to Test:**
Column 1	Paint System Approval	Substrate: Polyurethane
		Colors: Type C: Red and Blue Paint at Primary Gloss C (PGC) Gloss
Column 2	Color Approval	Requested Color and Substrate

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Table 2: Testing Requirements

Test	Standard	Requirement	1	2
			Number Samples	
Film Thickness	ISO 2808	Paint supplier specify range [Note 2]. Report actual values of samples.	1 [Note 1]	1
Appearance	Visual check	No objectionable defects, must match standard	1 [Note 1]	1
Cure	GMW15891, 92% minimum denatured ethyl alcohol	Rating ≤ 1 for monocoats, Rating = 0 for base/clear	1 [Note 1]	1
Initial Adhesion	GMW14829, Method A	Rating ≤ 1	3 [Note 1]	3
Humidity	Perform the following cycle: 144 h per GMW14729, Recover 1 h at room temperature, perform GMW14829, Method A	Rating ≤ 1, No objectionable defects	3 [Note 1]	3
Oven Age + Humidity	Perform the following cycle: 168 h in Oven [Note 3], Recover 1 h at room temperature, 24 h per GMW14729, Recover 1 h at room temperature, perform GMW14829, Method A	Rating ≤ 1, No objectionable defects	3 [Note 1]	3
Effects of Cleaners and Lotions	For each cleaner [Note 4], apply ten (10) drops for 1 minute to paint at room temperature. Per ISO 20433, perform ten (10) double strokes of approximately 50 mm in length. Evaluate color transfer to the crock cloth and color change on the test plaque.	Rating ≥ 4 per ISO 105-A02	1 [Note 1]	1
Sunscreen and Insect Repellent Resistance	GMW14445 followed by GMW14698, 1 mm hemispherical tip, 3 N load	Rating ≤ 2 [Note 5]. No penetration of surface when evaluated with and without 10x magnification	3 [Note 1]	3
Color Crock	ISO 20433 Dry Rubbing Method, ten (10) double strokes	Rating ≥ 4 per ISO 105-A02	1 [Note 1]	1
Wear Resistance	GMW3208, CS-10 wheel, 500 g load, 1000 cycles per nominal 25 µm dry film build	No wear through to substrate or adverse effects. If primer used, no wear through to primer	1 [Note 1]	1
Scratch and Mar Resistance - Initial	GMW14698, 1 mm hemispherical tip, 3 N load	No penetration of surface when evaluated with and without 10x magnification. No obvious visually apparent marring	1 [Note 1]	1
Scratch and Mar Resistance - After Oven Age	168 h in Oven [Note 3], Recover 1 h at room temperature followed by GMW14698, 1 mm hemispherical tip, 3 N load	No penetration of surface when evaluated with and without 10x magnification. No obvious visually apparent marring	1 [Note 1]	1
Perspiration Resistance	GMW14334, Method C followed by GMW14698, 1 mm hemispherical tip, 3 N load	Rating ≥ 4 to 5 per ISO 105-A02 No objectionable defects No penetration of surface when evaluated with and without 10x magnification	1 [Note 1]	N/A

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