



Metallized Interior Components

1 Scope

1.1 Material Description. This specification covers the material requirements for metallized coatings for interior components. Decorative constructions approved to this specification will require the use of a primer that enables adhesion, a metal layer from evaporative deposition (sputter-ion coating, low-temperature arc vapor deposition or physical vapor deposition (PVD)) that provides decoration and reflectivity, and a topcoat that protects the metallized finish.

The primer and topcoat finishes shall be fully cured with time and temperature cycles suited to the part composition. They shall provide maximum durability, appearance and metal adhesion. The metal layer shall be produced by evaporative deposition onto the primed surface. Its appearance shall be uniform and free from visible defects.

1.2 Symbols. Not applicable.

1.3 Applicability. Typical applications include interior decorative components and miscellaneous interior trim.

1.4 Remarks. Surrogate data for production intent materials and processes must be demonstrated to meet the requirements of this specification prior to sourcing, and at the latest, prior to the intended program Integration Vehicle Engineering Release (IVER). Contact the appropriate GM Materials Engineer.

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
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2.2 GM Standards/Specifications.

GMW3059	GMW6992	GMW14334	GMW14829
GMW3208	GMW14093	GMW14444	GMW15891
GMW3221	GMW14124	GMW14445	GMW16853
GMW3232	GMW14162	GMW14698	
GMW3417	GMW14270	GMW14729	

3 Requirements

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

3.2 Construction Requirements. For each new construction color, the supplier must submit the following:

- **Appendix A, Figure A1:** Construction Specification Sheet along with any additional supportive documentation.
- **Appendix A, Figure A2:** Construction Data Form along with supportive test reports.
- A Process Control Plan.
- A Technical Data Sheet (TDS) for each material used in the construction showing recommended film builds and processing requirements.

3.3 Testing. Perform all testing as indicated in Table 1. The column for “New Construction or New Color” is for any new color and/or new construction and should be done on production level process plaques. Part Validation is for each new part validation and requires the testing of production level parts.

3.3.1 GM Confirmation Testing. For all New Construction or New Color approvals, three (3) panels must be submitted for sunscreen and insect repellent resistance and resistance to fine scratching testing to be performed by GM Materials Engineering.

3.3.2 Test Report. Use Appendix A, Figure A2 the Construction Data Form to report all New Construction or New Color test results. An electronic copy of the laboratory test report(s) must also be submitted.

3.3.3 Laser Etching. Laser etching is considered a new and different construction than non-etched. Systems that require laser etching that exposes the substrate must choose a substrate that contains Ultraviolet (UV) stabilizers for testing. Testing for laser etching shall either be done on laser etched samples replicating production. The test samples must meet sunscreen and insect repellent resistance and effects of cleaners and lotions requirements when tested at all different paint layer interfaces. The number of layers tested and approved for the laser etch paint system shall be clearly documented in the construction specification sheet, see Appendix A, Figure A1.

Table 1: Testing Requirements

Test	Standard	Requirement	New Construction or New Color	Part Validation
			Number of Samples	
Film Thickness	ISO 2808	Report each layer. Total minimum thickness 25 µm. Topcoat minimum thickness 15 µm. ^{Note 1}	Three (3)	Three (3)
Appearance	Visual check to the master standard under the conditions of GMW6992	No objectionable defects, all test samples must match standard	One (1)	One (1)
Cure	GMW15891, 92% minimum denatured ethyl alcohol	Rating ≤ 1	One (1)	One (1)
Initial Adhesion	GMW14829, Method A	Rating ≤ 1	Three (3)	Three (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	Three (3)	Three (3)
Oven Age plus Humidity	Perform the following cycle: 168 h in Oven ^{Note 2} , Recover 1 h at room temperature, 24 h per GMW14729,	Rating ≤ 1, No objectionable defects	Three (3)	Three (3)

Test	Standard	Requirement	New Construction or New Color	Part Validation
			Number of Samples	
	Recover 1 h at room temperature, perform GMW14829, Method A			
Quick Thermal Cycle	Place sample in $-40\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ for 1 h, removed and quickly (< 1 minute) place into an adjacent oven at $90\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ for 1 h. Above is one (1) cycle. Repeat four (4) cycles total before judging parts.	No objectionable defects	Three (3)	Three (3)
Effects of Cleaners and Lotions	For each cleaner Note 3 , 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	One (1) Per Cleaner	Not applicable
Sunscreen and Insect Repellent Resistance	GMW14445 followed by GMW14698, 1 mm hemispherical tip, 8 N load	Rating ≤ 2 Note 4	Three (3)	Three (3)
Color Crock	ISO 20433 Dry Rubbing Method, ten (10) double strokes	Rating ≥ 4 per ISO 105-A02	One (1)	Not applicable
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	Three (3)	Not applicable