



Interior Decorative Ornamentation Performance Specification

1 Scope

1.1 Material Description. This engineering standard covers the material related part performance requirements for interior decorative ornamentation parts.

1.2 Symbols. Not applicable.

1.3 Applicability. Interior decorative ornamentation targeted at multiple layer technologies such as metallized surface with local paint coating and clear coat over entire surface. Specification is not targeted at emblems that have other GM specifications such as chrome-plated parts or thread-stitched emblems.

2 References

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

2.1 External Standards/Specifications.

ISO 105-A02	ISO 2808	ISO 17025	ISO 20433
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2.2 GM Standards/Specifications.

GMW3059	GMW3235	GMW14444	GMW14829
GMW3205	GMW3417	GMW14445	GMW14892
GMW3208	GMW14093	GMW14458	GMW15634
GMW3221	GMW14270	GMW14698	
GMW3232	GMW14334	GMW14729	

3 Requirements

3.1 Requirements on Test Specimens. All test specimens shall be conditioned to GMW3221, Code B, unless the test method indicates that standard conditioning is not required. Condition the specimens for a minimum of 24 h prior to testing or until moisture equilibrium is reached. If specimens are tested outside the conditioned environment, they shall be tested within ten (10) minutes of removal.

3.2 General Requirements.

3.2.1 Test Data. Laboratory testing is to be performed by a laboratory that conforms to ISO 17025 and is acceptable to the customer (GM). Test reports must conform to ISO 17025.

3.2.2 Data Reporting. If all individual readings of a specific test meet or exceed the specified requirements, report the average. Unless otherwise stated, any individual reading outside the specified limit does not meet the requirement. Report all individual test results that do not meet the requirements. All required information shall be reported on the appropriate test data reporting forms (see Appendix A, Data Sheet A1). Any additional test requirements shall be provided to GM upon request.

3.3 Construction Requirements.

3.3.1 Odor GMW3205. Test as received and in dry condition (GMW3205 Code B). The test specimen volume to test container volume ratio shall be noted on the part drawing/in the math data. If no ratio is given, a ratio of 1 to 1000 shall be used. Requirement is odor scale rating of six (6) or higher.

3.3.2 Fogging, Volatility of Organic Constituents GMW3235. Test to Method B and test temperature is T2 for all parts, unless temperature deviation agreed to by GM Materials Engineering. Requirement is 2.0 mg maximum.

3.3.3 Impact Resistance GMW14093, Apparatus All, Code 3. When the part or assembly is mounted either in a vehicle body or an appropriate test fixture, it must withstand an impact of ≥ 4.0 J in parts where customer feet may contact, while all other parts shall withstand an impact of ≥ 2.5 J, and a deviation may be provided to ≥ 1.0 J for parts that are horizontal or are within 30 degrees of horizontal and out of customer feet contact zone. The test location shall be determined by the GM Design Responsible Engineer. Test pieces shall be examined with the naked eye. After completion of test, the component shall show no breakage or cracks. Any evidence of more than a single impact point (double bounce or rebound) will necessitate a retest until a single impact is achieved.

3.3.4 Adhesion GMW14892. Only applicable to adhesively applied type decoration. Adherents shall separate cohesively or minimum adhesive strength shall be 525 Nm.

3.3.5 Dimensional Stability GMW14444. Test ornament to part level requirements in GMW14444. The test piece shall show no significant surface changes, particularly changes in color or gloss, no cracking, crazing or any other changes detrimental to serviceability. Other unacceptable changes include: objectionable odors, formation of bubbles or voids, peeling of foil from foam, shrinkage, warpage, plasticizer exudation. Test pieces shall comply with the dimensions specified on the drawing after completion of the test. The dimension of the test pieces shall be checked for drawing compliance by naked eye. For arbitration purposes, the dimensions may be checked by measurement.

3.3.6 Resistance to Perspiration GMW14334, Code C. For high touch parts (such as floor shifters, steering wheels, door pull handles, etc.,) as determined by GM Design Responsible Engineer. Requirement is no change of surface, e.g., change in gloss, shrinkage, discoloration, wrinkling (creasing), blistering, distortion, cracking, etc.

3.3.7 Resistance to Cleaning Agents. Apply 1 mL each of commercial window cleaner and commercial vehicle cleaning agent in separate locations to the sample. Wait 60 s then rub the area with at least 50 mm long strokes for 10 double rubs using a folded cheesecloth. There shall be no objectionable soiling, staining or change in appearance rating < 4 on the grey scale per ISO 105-A02.

3.3.8 Protective Tape/Foil Compatibility. If protective tape applied, test and evaluate per requirements of GMW14444.

3.3.9 Flammability GMW3232. GMW3232 requires compliance with Federal Motor Vehicle Safety Standard (FMVSS) 302.

Note: In addition, the materials and components shall meet the requirements according to the relevant legislations and regulations of the countries to which they are supplied (e.g., FMVSS 302 for USA, documentation required according to TRIAS 48 for Japan).

3.3.10 Natural Weathering GMW3417. Must meet requirements and evaluation criteria in part form as defined by location in GMW14444. For information, also test to 50 000 Total Normalized Radiation (TNR) langleys at 85 °C if part requirement is below 50 000 TNR langleys. Ratings must be six (6) or greater.

3.3.11 Artificial Weathering. Samples shall be exposed and evaluated per artificial weathering requirements of GMW14444 Code 2.

3.3.12 As-Received Paint Adhesion. Test per GMW14829-A with a minimum of 95%, rating 1, of the paint remaining in the crosshatch area. Brittleness of the paint film, as evidenced by chipping or flaking while scribing the test lines, shall be cause for rejection. Applicable to all surfaces that are painted (may include first surface and back painted parts).

3.3.13 Wear Resistance GMW3208. No wear-through of topcoats or other objectionable defects after 100 cycles taber abrader wear tester per GMW3208, CS-10 wheels with a 500 g load. If testing cannot be run in part form due to contour, flat test plaques shall be made and tested.

3.3.14 Heat Aging. The part must not develop any perceptible color or gloss change, loss of adhesion, distortion or exuding after being subjected to 336 h exposure at installation position temperature defined in GMW14444 in an air circulating oven, unless temperature deviation agreed to by GM Materials Engineering.

3.3.14.1 Painted samples subjected to oven aging shall withstand the adhesion tests per GMW14829-A. Recovery period of 1 h should be allowed between removal from the oven. A rating of one (1) per GMW14829-A is the requirement.

3.3.15 Humidity Aging GMW14729. The part must not develop any perceptible color or gloss change, loss of adhesion, distortion or exuding after being subjected to 336 h exposure.

3.3.15.1 One (1 h) hour after removal from humidity chamber, the samples shall pass the crosshatch adhesion test GMW14829-A with a rating of 1.

3.3.16 Film Build ISO 2808. If painted application, report results minimum three (3) readings. Applicable to all surfaces that are painted (may include first surface and back painted parts).

3.3.17 Sunscreen and Insect Repellent Resistance GMW14445. Test three (3) parts per GMW14445. Tested part surface shall not show more than a two (2) rating to be considered a pass. If flat part, the exposed area of coating shall not show removal after a 1 mm hemispherical tip weighted with an 8 N load has been dragged across the surface per GMW14698-B. Applicable to only first surface painted parts.

3.3.18 Color Crock ISO 20433. The painted finish on the as-received samples shall be tested by doing ten (10) complete back and forth strokes when tested per ISO 20433, dry method. Evaluate the color change on the test plaque to the grey scale per ISO 105-A02. A reading of four (4) will be considered a pass. Applicable to all surfaces that are painted (may include first surface and back painted parts).

3.3.19 Cure Test. For painted parts only, the cloth to be used to perform the cure test shall be a crock cloth per ISO 20433. The solvent used for the cure test shall be 92% minimum ethyl alcohol, denatured. There shall be no paint film degradation after the following test method: Five (5) back and forth rub strokes as applied with firm finger pressure using a cloth saturated with denatured ethyl alcohol. Applicable to all surfaces that are painted (may include first surface and back painted parts).

Note: There may be some visible transfer of color agents associated with this procedure, but there must not be any film degradation visible when viewed with a 10x magnifying glass.

3.3.20 Corrosion Resistance Test GMW14458. For any parts that contain metallic component, test to 8 h of copper accelerated acetic acid salt spray (CASS) per GMW14458. Components shall be free of any surface defects and free of corrosion on all significant surfaces when examined at normal reading distanced with the unaided eye and uniform diffused light. This includes pitting, blistering, spotting, etc., whether or not accompanied by substrate corrosion.

3.3.21 Scratch Resistance (GMW14698-B). Painted surface shall not show visible penetration where the 1 mm hemispherical tip weighted with a 13 N load has been dragged across the surface per GMW14698-B. Testing shall be done as-received and after heat aging per 3.3.14.

3.3.22 Emissions GMW15634. A semi-quantitative analysis must be done to determine if products are emitted from the part. Target values:

- Volatile Organic Compound (VOC): 1000 µg/g.
- Semi-Volatile Organic Compound (SVOC): 1000 µg/g.
- The requirements will be for information only.

3.4 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to submit a full material composition disclosure to GM via the International Material Data System (IMDS) or via a completed GMW3059 report form.

4 Manufacturing Process

4.1 Quality Control Monitoring. Film build must be tested at the beginning and end of the shift as a standard lot assessment test. If film build is not an appropriate test for technology, GM and the part maker must agree to one (1) lot assessment test. Additional lot assessment testing shall be completed by the part maker as requested by GM.

4.2 Manufacturing Process Description. Manufacturing process plan shall be presented to GM and details process steps, layered description, and targeted tolerances. Complete Construction Certification Form (Appendix B, Data Sheet B1) or submit internal plan that is acceptable to GM responsible engineer.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.