



Performance Requirements for Interior Applied Graphics On Parts

1 Scope

1.1 Material Description. This procedure covers the performance requirements for interior applied graphics on parts. This includes pad printing and screen printing of inks or paints.

1.2 Symbols. Not applicable.

1.3 Applicability. Some examples of parts which should be covered by this specification are first or second surface interior components with graphics such as clusters, stalks, and switches.

1.4 Remarks. The graphic shall be designated according to the area of application on the vehicle.

- Type 1: Covers graphics on the first surface of interior trim parts that are exposed to Ultraviolet (UV) light.
- Type 2: Covers graphics on the first surface of parts not exposed to UV light (e.g. interior, trunk).
- Type 3: Covers graphics on the second surface of interior parts that are exposed to UV light.

For performance requirements of underhood graphics refer to GMW16910.

2 References

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

2.1 External Standards/Specifications.

ASTM D3012	ISO 105-A02	ISO 4577	ISO 20433
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2.2 GM Standards/Specifications.

GMW3059	GMW14270	GMW14698	GMW16853
GMW3205	GMW14334	GMW14729	
GMW3208	GMW14444	GMW14829	
GMW3221	GMW14445	GMW15634	

2.3 Additional References.

American Association of Textile Chemists and Colorists (AATCC) Evaluation Procedure 2

American Association of Textile Chemists and Colorists (AATCC) Test Method 8

3 Requirements

Unless otherwise specified, all materials shall be tested at standard conditions, 22 °C ± 2 °C and 50% ± 5% Relative Humidity (RH).

3.1 Requirements on Test Specimens. Reference GMW3221.

3.2 Emissions Testing of Interior Materials and Parts. For all Code E designated parts per GMW14444, reference GMW16853 for emissions testing of interior materials and parts.

3.3 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. This includes emissions testing per GMW15634 and odor testing per GMW3205.

3.4 Test samples shall be subjected to the tests outlined in 3.6 thru 3.8 according to the Type designation. The tests shall be conducted after a minimum aging period of 72 h at room temperature following the pad printing process.

3.5 Test Samples. Parts, portions of parts or test specimens representative of the material and process used in production shall be used for all testing unless otherwise specified.

3.6 Type 1 Requirements.

3.6.1 Colorfastness. Samples shall be exposed per the Colorfastness to Artificial Light section table of GMW14444. Samples shall show no objectionable defects to gloss level or color change, chalking or other visible deterioration after exposure.

3.6.2 Natural Weathering. Samples shall be exposed per the Natural Weathering section table of GMW14444. Samples shall show no objectionable defects to gloss level or color change, chalking or other visible deterioration after exposure.

3.6.3 Effect of Cleaners. Parts in the as-received condition shall show satisfactory results when tested for cleaning/solvent resistance per GMW14334, Codes A and C.

3.6.3.1 There shall be no discoloration of the surface or transfer of color to the cloth. AATCC Test Method 8 shall be used to judge color transfer. The white cheesecloth shall have an AATCC rating better than Class 4 on the chromatic transfer scale (see AATCC Evaluation Procedure 2 or ISO 105-A02; also, see AATCC Test Method 8, Section 9.4 for further information.)

3.6.4 Color Crock. Parts or portions of parts shall meet a rating ≥ 4 per ISO 105-A02 following ten (10) strokes ISO 20433 Dry Rubbing Method.

3.6.5 Aging. There must be no objectionable shrinkage, distortion, tackiness, gloss, color change or other degradation after 168 h at $95^{\circ}\text{C} \pm 2^{\circ}\text{C}$ in an air-circulating oven. See ASTM D3012 and ISO 4577 for the test apparatus and procedure.

3.6.6 Wear Resistance. The surface of the tested part shall show no wear through or other adverse effects after 1000 cycles when tested per GMW3208, CS-10 wheel, 500 g load.

3.6.6.1 The testing of samples must be performed on graphics applied to smooth flat panels representative of production materials and processes.

3.6.7 Adhesion. The test sample shall withstand the tape adhesion test per GMW14829, rating of 1 minimum.

3.6.7.1 Brittleness of the ink, as evidenced by chipping or flaking while scribing the test lines, shall be cause for rejection.

3.6.8 Humidity Test. Samples shall withstand a 24 h humidity exposure per GMW14729 and meet the following requirements:

3.6.8.1 There shall be no evidence of blistering, water spotting or gloss change when examined 1 minute after removal from the test cabinet.

3.6.8.2 Samples shall withstand the adhesion test per 3.6.7.

3.6.9 Sunscreen Lotion and Insect Repellent, GMW14445/GMW14698. Test material performance using GMW14445 and rated by both visual appearance and scratch retention. Samples meet requirements that have an appearance rating of 2 or better. Samples may be approved with deviations.

3.6.9.1 Following sunscreen and insect repellent exposure, run scratch test per GMW14698, Method A or B over one (1) of the exposed areas of the graphics. Samples with no penetration at 8 N force are deemed to have met the test criteria.

3.7 Type 2 Requirements.

3.7.1 Effect of Cleaners. Parts in the as-received condition shall show satisfactory results when tested for cleaning/solvent resistance per GMW14334. Codes A and C.

3.7.1.1 There shall be no discoloration of the surface or transfer of color to the cloth. AATCC Test Method 8 shall be used to judge color transfer. The white cheesecloth shall have an AATCC rating better than Class 4 on the chromatic transfer scale (see AATCC Evaluation Procedure 2 or ISO 105-A02, also, see AATCC Test Method 8, Section 9.4 for further information).

3.7.2 Color Crock. Parts or portions of parts shall meet a rating ≥ 4 per ISO 105-A02 following ten (10) strokes ISO 20433 Dry Rubbing Method.

3.7.3 Aging. There must be no objectionable shrinkage, cracking, distortion, tackiness, gloss, color change or other degradation after 168 h at $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ in an air-circulating oven. See ASTM D3012 and ISO 4577 for the test apparatus and procedure.