GM	WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW17328

Ultraviolet Durability of Primers and Painted Plastics

1 Introduction

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. This procedure provides a method to test whether a primer or primer surfacer is sensitive to Ultraviolet (UV) energy, which may lead to topcoat delamination. This procedure can also be used to evaluate the photosensitivity of plastic substrates and whether a primer is necessary to protect the substrate from ultraviolet energy.

1.2 Applicability. Applicable to liquid and powder primer materials.

1.3 Remarks. If a new primer color is introduced into an approved technology evaluation, this test may be deemed appropriate by the responsible Manufacturing Engineering Vehicle Systems Paint Materials Engineer.

2 References

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

2.1 External Standards/Specifications.

SAE J2527

2.2 GM Standards/Specifications.

9984801 GMW14829 GMW14873 GMW15545
GMW14729

2.3 Additional References. None.

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.2 Equipment. All required equipment is specified in the applicable procedures listed in 2.1 and 2.2.

3.3 Test Vehicle/Test Piece. Test panels as described in 4.1.

3.4 Test Time. Required test duration is defined in 4.3 for prescribed test procedures.

Note: Some tests are conducted concurrently, and some are conducted consecutively.

Calendar time:	Varies by test and/or procedure
Test time:	Varies by test and/or procedure
Coordination time:	Varies by test and/or procedure

© Copyright 2020

Documents
Document Sharing Hub

Copyright General Motors
Provided by IHS Markit under license with General Motors

Full document details: GMW GMW17328 2020

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Testing is performed by supplier laboratories or other certified independent laboratories. Personnel/skills are maintained by these parties as part of their continuing certification and laboratory operations protocols.

4 Procedure

4.1 Preparation.

4.1.1 Test Panels.

4.1.1.1 For primers intended over electrocoat, use 100 mm × 300 mm electrocoated steel panels. The electrocoat must be a GM approved material. Panel preparation for electrocoat shall be at target film build (typically 15 µm to 20 µm). Baking electrocoat at upper bake limit, typically 65 minutes at 185 °C, in a direct fired gas oven is recommended to maximize electrocoat photosensitivity. Alternate bake shall be per agreement by the responsible Manufacturing Engineering Vehicle Systems Paint Materials Engineer.

4.1.1.2 For primers intended for plastic substrates, 100 mm × 300 mm panels molded from representative GM approved plastic substrate(s) as identified by the responsible Manufacturing Engineering Vehicle Systems Paint Materials Engineer. All plastic test panels shall be prepared per 9984801 prior to priming.

4.1.1.3 A minimum of 14 panels is required for this test procedure. Seven (7) are required for the test primer and seven (7) are required for the control material. Duplicate panels for each system shall be exposed in Florida (natural weathering) and also to a Xenon Weather-Ometer (artificial weathering). Additional panels can be run at the discretion of the supplier.

Note: Florida Outdoor Exposure should not define a specific site as there are many. Suppliers may use their own site per agreement by the responsible Manufacturing Engineering Vehicle Systems Paint Materials Engineer.

Note: Currently, all global specifications pertaining to paint approvals, have defined Florida exposures as the prescribed/agreed upon method.

4.1.2 Primers.

4.1.2.1 For a new primer or primer surfacer that is being evaluated for approval, the supplier shall disclose in their initial submission letter whether the primer contains any aromatic ethers (epoxy) or other products that may be UV sensitive. The test primer will be formulated at the upper limit(s) of any UV sensitive constituents.

4.1.2.2 A GM approved control primer and color that is agreed to by the responsible Manufacturing Engineering Vehicle Systems Paint Materials Engineer.

4.1.2.3 If a plastic substrate itself is being evaluated for resistance to UV degradation, then the test system will be prepared with non-pigmented basecoat (BC)/clearcoat (CC) only, as defined in 4.1.3 and 4.1.4. However, the control system shall consist of the new substrate with a GM approved plastic part primer.

4.1.3 Basecoat (BC). The test BC shall be a GM approved technology without any pigmentation. The BC formulation shall not contain any UV Absorber (UVA). The level of Hindered Amine Light Stabilizer (HALS) shall be within the normal formulating range for that BC technology.

4.1.4 Clearcoat (CC). The test CC shall be a GM approved technology with 1% UVA (based on resin solids). The UVA can be chosen from amongst Tinuvin 900, Tinuvin 928 or Tinuvin 384 (available from suppliers such as Ciba or BASF). These products all have similar absorption strengths. A supplier may choose an alternate UVA material if it is more appropriate to their CC technology, but the substitution level should try to approximate the strength of the referenced absorption at whatever level is required. The UVA used should be identified on the required transmission spectra, The HALS level shall be within the normal formulating range for that CC technology.

4.1.5 Test Sample Preparation.

4.1.5.1 Coat the two (2) sets of test panels. Coat the first set with the new primer and the second set with the approved control material applied at the following film builds:

- Liquid Primers: 75% of target (target is typically 25 µm).
- Powder Primers: 75% of target (target is typically 50 µm).

© Copyright 2020

Documents
Document Sharing Hub

Copyright General Motors
Provided by IHS Markit under license with General Motors

Full document details: GMW GMW17328 2020