



Dialkyl Phthalate Absorption by Non-lacerative Glazing Coatings

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 test procedure determines how much Dialkyl non-lacerative windshield coatings absorb Dialkyl Phthalate and how affects the abrasion resistance properties of the film. Dioctyl Phthalate (DOP) shall be used as being representative of the Dialkyl Phthalate family.

1.2 Applicability. This document is the GM Worldwide Windshield Coating Testing Standard. Its purpose is to establish a common test methodology for windshield coatings to ensure that a high quality world class system is consistently developed and produced. This is a living document and any suggestions or revisions will be reviewed and/or updated annually by the Fixed Glass Global Subsystem Leadership Team (GSSLT). This document is applicable for all car, multipurpose passenger vehicle (MPV), and truck models produced by GM Worldwide.

2 References

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

2.1 External Standards/Specifications.

FMVSS 205

2.2 GM Standards/Specifications.

GMW3059 GMW3600

2.3 Additional References.

- CG180 5-Phase Document (ID)
- GM Security Guidelines: <https://gmweb.gm.com/HR/Security/Pages/FutureGuide.aspx>
- Subsystem Technical Specification (SSTS)

(ID) = This document is limited to internal distribution within General Motors and shall not be distributed outside this company. Contact the GM Lead Engineer for further instructions.

3 Resources

3.1 Facilities. No special facilities required. However, all measuring variables as specified in this specification shall be determined correctly with respect to their physical definition

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.

- Personal Protection Equipment (PPE).
- Balance with an accuracy of ± 0.001 g.
- Beaker and watch glass, 100 mL.
- Beaker and watch glass, 4000 mL.
- Oven, 70 °C.
- Digital camera.

3.3 Test Vehicle/Test Piece. Test samples shall be of production intent design and material for design validation (DV); or, production intent design and materials manufactured with production processes (home line) for product validation (PV). Any changes to the components or material, e.g., design, fit, form, function, properties, manufacturing process, and/or location of manufacture require revalidation. GM shall approve validation methods for product/process changes before the supplier is committed to the change. Refer to GMW3600.

3.3.1 Unless otherwise specified, three samples of components or systems shall be tested.

3.3.2 All components/systems used in testing shall be within drawing specifications and have supporting data prior to start of test.

3.4 Test Time. Test duration is dependent on the time to reach full absorption.

3.5 Test Required Information.

3.5.1 Notification GM Validation is to be notified of test failures within 24 h period of occurrence.

3.5.2 Five (5) Phase. Supplier to develop five phase document for all test failures.

3.5.3 Product Security. Security protocol for the test vehicle must be followed per GM Security Guidelines.

3.6 Personnel/Skills. The test facility shall have sufficient personnel having the necessary education, training, technical knowledge, and experience for performing the required tests. Prior experience in setting up and running similar tests. Experience in the use of the referenced test equipment.

4 Procedure

4.1 Preparation.

- Read the proper requirement from the SSTS and this GMW thoroughly.
- Ensure that proper Personal Protection Equipment is used during set up and testing.
- Ensure that the materials are in compliance to GMW3059 and any regulatory requirements for country of sales.

4.2 Conditions. All conditions specified shall be targeted toward the specified value with any given tolerance ($\pm$) used to compensate for variation. During testing, conditions specified shall not be readjusted within the tolerance unless it is to maintain the particular test condition within the specified tolerance. If such an adjustment is made, it shall be approved by the appropriate GM engineer prior to the start of any testing. Unless otherwise specified, perform the tests in the as received condition without any special pre-conditioning.

4.2.1 Environmental Conditions. Test to be run at 70 °C. Application of the DOP and weighing can be done at ambient.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Record initial weight of 30 mm x 30 mm samples.

4.3.2 Place 30 mm x 30 mm samples in 100 mL beaker and place 100 mm x 100 mm samples in 400 mL beaker.

4.3.3 Fill beakers with enough DOP to cover the samples.

4.3.4 Place both beakers in oven at 70 °C.

4.3.5 Daily remove the 30 mm x 30 mm sample, wipe it dry and weigh it.

4.3.5.1 Plot data points on a Time vs. Weight graph.

4.3.6 Terminate weighing when either the weight increase over a 48 h period is $< 0.03\%$ or when a line through the data plotted on a graph of time vs. weight becomes asymptotic to a horizontal line.