



Compatibility of Common Cleaners with Alternate Glazing Materials

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 if alternate Glazing materials are adversely affected by cleaning with common types of cleaners.

1.2 Applicability. This standard is applicable for all car, multipurpose passenger vehicle (MPV), and truck models of 4536 kg gross vehicle mass (weight) rating or less produced by GM worldwide.

1.3 Remarks. This document is the GM Worldwide Glazing Testing Standard. Its purpose is to establish a common test methodology for Alternate Glazing Materials 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).

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3059

GMW3600

GMW15760

2.3 Additional References.

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

(ID) = This document is limited to internal use within General Motors and shall not be accessed 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 standard 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).
- Ammoniated Cleaner.
- Methanol-water based cleaner.
- Heavy Duty household cleaner with a pH = 10, such as Fantastik.

- Cloth Towel.
- Paper Towels.

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. Test samples are to be determined using GMW15760.

3.4 Test Time. Not applicable.

Calendar time: 200 d

Test time: 1 h/d

Coordination time: 1 h

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

- 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.
- Confirm Product Security Protocol for the vehicle tested by contacting the Vehicle Performance Manager (VPM). (Vehicles requiring camouflage, etc., must be carefully secured throughout the testing procedure so that no lapse in vehicle security occurs.)

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 ambient temperature ($23\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$).

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 Spray Ammoniated Cleaner on Sample No. 1 and wipe dry with cloth towel.

4.3.2 Spray high pH household cleaner on Sample No. 2 and wipe dry with paper towel.

4.3.3 Wet a paper towel with Methanol-water base cleaner and wipe sample No. 3 Wipe Dry with another paper towel.

4.3.4 Repeat 4.3.1 through 4.3.3 once per day for 200 days. Record the results using Data Sheet A1 (or equivalent) in Appendix A. The supplier shall work with the GM Lead Engineer to comprehend these requirements.

4.3.5 Examine sample for degradation, such as crazing, scratching, loss of transparency, delamination, etc.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Not applicable.

5.3 Test Documentation. Test videos are to be stored in Global Document Management (GDM) for a minimum of three (3) months after Start of Regular Production (SORP). Name the video files using the format: "MY Program Commodity Test Name Results Date", "2011 D1SB-N AIP Water Management Wiper Motor Results 23July10" and reference the file in GM Evaluation Report. Test results and still pictures of concerns from videos are to be documented on GM Evaluation Report.

5.4 Samples/Components. Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM Department prior to the start of delivery of production level components or materials. Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacture requires a new release of the product. It is the sole responsibility of the supplier to provide the customer, unsolicited, with documentation of any change or modification to the product/process, and to apply for a new release.

If not otherwise agreed to, the entire verification test shall be repeated and documented by the supplier prior to start of delivery of the modified or changed product. In some cases, a shorter test can be agreed to between the responsible GM department and the supplier.

5.4.1 Record measurements and results as specified by individual procedures in the final test report.

5.4.2 Document the test results in a test certificate or report.

Test reports shall include all of the following:

- Test equipment.
- Serial numbers.
- Calibration information.
- Description of test material (including design revision, lot or batch, options, etc.)
- Test specification date, pertinent setup information, and photographs.

Evaluation reports should document the results of all their validation activities and shall be provided to GM Engineers upon request (see GMW3600). All reports are to be in the English language. Document all test results, parameters, and findings.

5.4.3 Photos. Photos of the test fixture, test setup and test sample shall be added to the test report.

5.4.4 Evaluation Reports. The supplier shall write evaluation reports to document the results of all validation activities and shall make the test results and evaluation reports available to GM engineers upon request. See GMW3600. All test reports are to be in English and available two (2) weeks after test completion.

5.4.5 Required Documentation. A 5 Phase Document (CG180) for all test failures within 24 h period of occurrence. The following is also required for all test reports:

- Procedure number and section numbers on all test reports.
- Requirement being met and SSTS requirement number.
- Part traceability – include cavity number, serial number, tool number, engineering change level (ECL), etc., to specifically identify the part.
- All test parameters for environment and equipment.
- Any authorized deviations to the plan.
- Test setup shall be photographed.
- Road map as required.
- Dimensional data on the test part as required.

6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site