



Rear and Quarter Window 100 Hour Defroster Grid Test

1 Scope

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 document is the GM worldwide glazing testing standard. The purpose is to establish a common test methodology for glazing materials to ensure that a high quality world class system is consistently developed and produced. This standard is for the development phase of new technologies but can be used for validation of the product. This document and any suggestions or revisions will be reviewed and/or updated annually by the Fixed Glass Global Subsystem Leadership Team (GSSLT).

1.2 Foreword. This is a component/subsystem level test and should not be used for vehicle level testing.

1.3 Applicability. This standard is applicable for all passenger vehicles, Multipurpose Passenger Vehicles (MPV), and truck models with heated grid elements in fixed glass and produced by GM Worldwide.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3600

2.3 Additional References.

Best Practice Number: 105219 (see Knowledge Set Number 1268). The supplier shall work with the GM responsible engineer to comprehend this requirement.

GM Security Guidelines

Subsystem Technical Specifications (STS)

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.

- Thermal Image Camera
- Power Supply
- Direct Current (DC) Power Supply
- Data Acquisition/Switch Unit
- Test Stand/Fixture



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.

3.4 Test Time.

Calendar time: 6 days
Test hours: 100 hours
Coordination hours: 10 hours

3.5 Test Required Information.

3.5.1 GM validation is to be notified of test failures within 24 hour period of occurrence.

3.5.2 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.

4 Procedure

4.1 Preparation.

4.2 Conditions. All conditions specified shall be targeted toward the specified value with any given ($\pm$) tolerance 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. The following conditions apply to all tests unless otherwise specified:

- Temperature: $+23 \pm 3$ °C
- Voltage: $V_{NOM} \pm 0.3$ V at motor terminals
- Humidity 20 to 70% unless otherwise specified

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. See the GM Design Release Engineer (DRE) and/or the Subsystem Validation Engineer (SVE) for agreements.

4.3 Instructions.

4.3.1 Test Preparation. Using the thermal imaging camera take an infrared (IR) image of the glass test piece prior to running the test. Attach Thermal graphic photos to the test report.

4.3.2 The test samples are to be cycled "ON" with a voltage of 13.5 V Direct Current (DC) for a total of 100 h continuous.

4.3.3 During the testing, monitor and record resistance every hour. Record the temperature and humidity at start of test, 15 h, 30 h, 45 h, 60 h, 75 h, and 90 h and at end of test.

4.3.4 After 100 h of testing, thermo graphic photographs are to be taken of each test sample.

4.3.5 Record observations, found during testing, in the test report.

4.3.6 Acceptance Criteria. Observe the test samples for any changes in the part resistance. All elements of the test sample shall remain functional during and upon completion of the test.

The power requirement of heated backlights shall be the greater of; a) a minimum of 500 W/m² or b) the required watt density determined via the Heated Back Window Spreadsheet in Best Practice Number: 105219 (reference: Knowledge Set Number: 1268). The supplier shall work with the GM Design Responsible Engineer to comprehend this requirement. The maximum temperature of the grid shall not exceed 70 °C when operated at 23 ± 3 °C. The bus bars shall always be a minimum of 10 °C lower than the heating elements (conductors).