



Two-Shot/Over Mold Adhesion Requirements

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 standard covers the adhesion requirements of plastic parts that have a two-shot (edge to edge/substrate to lace) or over molded (entire face of substrate) component.

1.2 Applicability. Air inlet panels, air dams, sight shields, luggage racks, fuel fill ports, etc.

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

GMW14124

GMW14729

GMW3221

GMW14444

3 Test Preparation and Evaluation

3.1 Resources.

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.

3.1.3 Facilities. Not applicable.

3.1.4 Equipment. Not applicable.

3.1.5 Test Vehicle/Test Piece. Four (4) production assemblies are required for test, with three (3) samples taken from each assembly. The complete component or a section therefrom shall be used for test pieces. Components shall be randomly selected from a minimum of fifty (50) parts, if not otherwise agreed with responsible GM Engineering Group. **If the component is not large enough to allow for three samples of sufficient size, additional assemblies will be required until twelve (12) samples are obtained.**

3.1.5.1 The assemblies shall be representative of production in all respects. If pre-production sample validation is required, the differences in materials and/or assembly process should be noted and accompany the test data for the record. However, to fulfill the specification, testing shall be done again when actual production samples are available, and those test results shall be added to the respective data package for the part record.

3.1.5.2 Test pieces shall not be tested within 72 h of manufacture.

3.1.6 Test Time. Not applicable.

3.1.7 Test Required Information. Not applicable.

3.1.8 Personnel/Skills. Laboratory personnel trained in using a constant rate tensile test machine.

3.2 Preparation. Not applicable.

3.3 Conditions.

3.3.1 Environmental Conditions. Unless otherwise stated in respective test procedures all samples shall be conditioned prior to each requirement test to GMW3221, Code A.

3.3.2 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.

3.4 Instructions. See 4.1.1.

3.5 Data. Not applicable.

3.6 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 specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

3.7 Documentation. 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.

3.7.1 Test Results. The test report shall have the same outline and numbering as this test specification.

4 Requirements and Procedure

4.1 Sample Testing. Sample (part) testing shall be accomplished in two (2) modes.

4.1.1 First, a non-destructive, proof-load will be run on all submitted parts. The proof-load testing will require a test fixture (specific for the part or a 75 mm section of the part) to facilitate a tensile pull of a 75 mm length of the two-shot or over molded molding. This 75 mm section of bonded molding shall withstand an 18 kg tensile load for 5 s. This proof-load shall be conducted at locations designated on the part print or as specified by the design or Materials Engineer. An 18 kg tensile load shall be used unless a more representative load is established for the proof-load test, and that load will be stated on the associated part print.

4.1.2 Following the proof-load, the five (5) assemblies shall be exposed (one each) to the following environments:

- a. 72 h room temperature.
- b. 14 days heat age at +80 °C.
- c. 7 days humidity (GMW14729).
- d. Cycle exposure (For Exterior applications use GMW14124, Cycle C, perform 2 cycles. For Interior applications use GMW14124, Cycle M, perform 2 cycles).
- e. 72 h high temperature (For Interior applications only). The high temperature shall be defined by the Installation Position Coding (defined in Table 1 of GMW14444 – +105 °C, +95 °C, +85 °C) or exception on the drawing.

4.1.3 After the exposures listed in 4.1.2, and a 24 h recovery at room temperature, the two-shot or over molded sections shall be peel tested. A 90 degree peel test (soft material peeled 90 degrees from the substrate) shall be performed using a 300 mm per minute pull rate. A 90-degree Peel Sled with 25 mm grip faces attached flush at one end of the 75 mm soft material specimen shall be preferred method (See Figure 1 & Figure 2). The separation mode and peel strength shall be noted and recorded for each test section.

4.1.4 Requirement. The following criteria must be met.