



Adhesion Requirements for Modular, Encapsulated Glass Assemblies

1 Scope

1.1 Material Description. This specification is intended to cover the adhesion performance for the encapsulation material (Polyvinyl Chloride (PVC), Reaction Injection Molded (RIM), Ethylene Propylene Diene (EPDM), Thermoplastic Elastomer (TPE), etc.) to glass in a modular glass assembly.

1.1.1 Part testing is to be accomplished in both of the two methods discussed in this standard.

1.2 Symbols. Not applicable.

1.3 Typical Applications. Applications subject to this performance requirement are fixed encapsulated glass such as automotive quarter (side) glass.

2 References

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

2.1 External Standards/Specifications.

ISO 188

2.2 GM Standards/Specifications.

GMW3059

GMW3368

GMW14729

GMW3221

GMW14124

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221.

3.1.1 Sample Conditioning. All samples are to be conditioned prior to each requirement test to GMW3221, Code A.

3.2 Test Samples. Production intent parts shall be used to verify capability of the intended part materials and process.

3.2.1 A total of 25 modular glass assemblies, five (5) per environment, shall be used for each test performed. Pull Off Test and/or Quick Knife Adhesion (QKA) Test.

3.3 Equipment.

3.3.1 Universal tensile testing machine capable of maintaining a jaw separation rate of 10 mm/minute $\pm$ 0.1 mm/minute and indicating a load of at least 2000 N. The indicated load shall have a variance not to exceed 1% of full scale.

3.3.2 Clamping fixture as described in Figure 1.

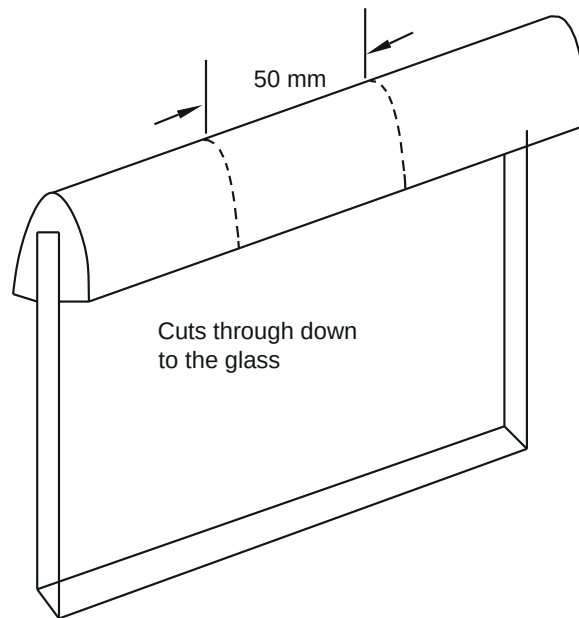


Figure 1: Sample Preparation

3.3.3 Conditioning chamber/equipment capable of maintaining the environments described in 3.4.3.

3.3.4 Protective (heat resistant) gloves for handling environment exposed parts.

3.4 Physical Requirements.

3.4.1 **Pull Off Test.** A 50 mm length of the encapsulation material shall be isolated from the surrounding encapsulation by cutting through the molding material to the glass surface. See Figure 1.

3.4.1.1 Specimen shall be clamped in pull fixture. See Figure 2.

3.4.1.2 Tensile test machine shall be set for a jaw separation of 10 mm/minute.

3.4.1.3 Maximum load at break, and the mode of failure, shall be recorded.

3.4.1.4 **Requirement.** The bond between the encapsulation material and the glass shall exceed 890 N when tested per this method. In addition to the minimum load, the resulting separation mode of the system shall be **cohesive** within either the encapsulation material and/or the adhesive system. These requirements shall be maintained after exposure to the test environments described in 3.4.3 after 1 h recovery at room temperature. The recovery temperature is to be recorded at the time of test.