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# SURFACE VEHICLE RECOMMENDED PRACTICE

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## PEEL ADHESION TEST FOR GLASS TO ELASTOMERIC MATERIAL FOR AUTOMOTIVE GLASS ENCAPSULATION

***Foreword***—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

***1. Scope***—This recommended practice defines a procedure for the construction and testing of a 180 deg peel specimen for the purpose of determining the bondability of glass to elastomeric material in automotive modular glass. This test method suggests that elastomeric material of less than 172 mpa modulus be used as the encapsulating material. The present practice of encapsulating automotive glass is described as molded-in-place elastomeric material onto the outer edge of the glass using thermoplastic or thermosetting material that quickly sets in the mold. The glass is removed from the mold with the cured elastomeric material bonded to the perimeter of the glass. This encapsulated glass module can now be bonded with a sealant adhesive into the body opening of a vehicle.

***2. References***

**2.1 Applicable Publication**—The following publication forms a part of the specification to the extent specified herein.

2.1.1 ASTM PUBLICATION—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 1002

***3. Test Substrates***

**3.1 Substrates**—The glass specimens that will be used for testing, or any surface conditioner such as ceramic coating, should be of the type recommended by automotive engineers.

The thermoplastic or thermosetting material should have a modulus of less than 172 MPa and be of the type used in automotive glass encapsulation.

**3.2 Dimensions**—The recommended glass sample size should be at least 203 mm (8 in) long and at least 3.2 mm (0.125 in) thick and at least 25.4 mm (1 in) wide.

**3.3 Glass Surface Preparation**—Glass surface preparation, such as cleaning and priming application, should be in accordance with supplier's or automotive engineer's recommendation.





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## *4. Test Specimen*

**4.1 Glass Encapsulation—**The samples for testing should be from glass encapsulated using injection molding equipment and procedures recommended by automotive engineers.

**4.2 Preparation for Specimen—**For ease of test specimen preparation in 3.5, it is recommended that the glass not be primed where the elastomeric material is to be cut out.

**4.3 Encapsulation Dimensions and Tolerances—**The elastomeric material should be molded onto the glass such that the width dimensions shall be at 6.4 mm (0.25 in) with a tolerance of ±0.25 mm (0.01 in). The thickness dimensions shall be at 3.2 mm (0.125 in) with a tolerance of ±0.128 mm (0.005 in). The overall length of the encapsulation shall be at least 203 mm (8 in) and should not have any flaws or nicks that could result in erroneous test results.

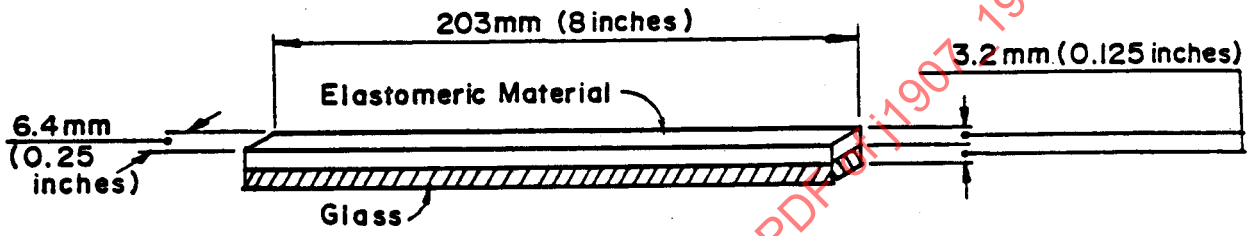


FIGURE 1—ENCAPSULATED TEST SPECIMEN

**4.4 Test Specimen Conditioning and Aging—**The molded glass should be conditioned according to suppliers or automotive engineers recommendation.

**4.5 Test Specimen Preparation—**At least 102 mm (4 in) should be cut away from the glass as illustrated in Figure 2 below in order to be used for clamping to the tensile tester.

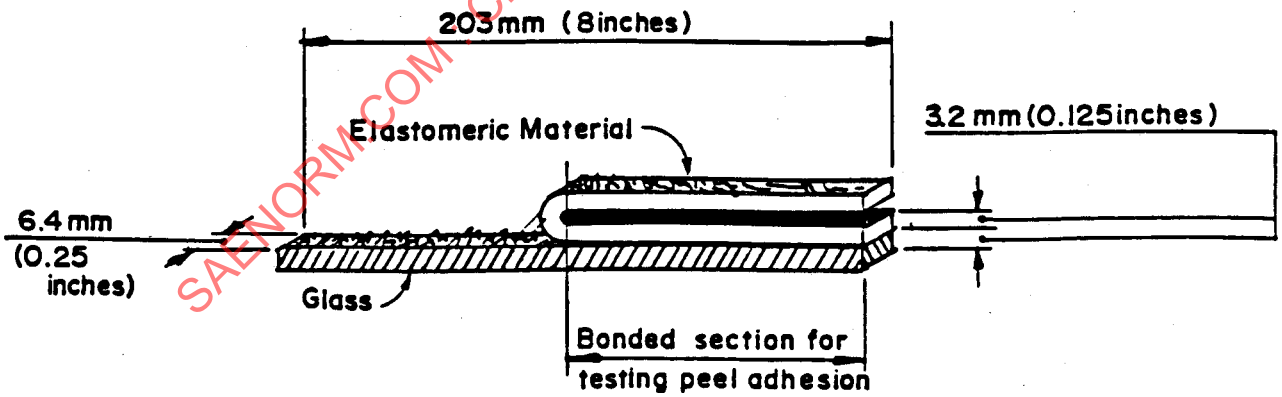


FIGURE 2—PREPARATION OF TEST SPECIMEN

## *5. Testing*

**5.1 Apparatus—**Test apparatus should be a tensile tester described in ASTM D 1002.

**5.2 Sample Clamping—**The top jaw should be clamped to the glass portion and the bottom jaw should be clamped to elastomeric material as described in Figure 3. If necessary, an extender can be attached to the elastomeric material to facilitate clamping.

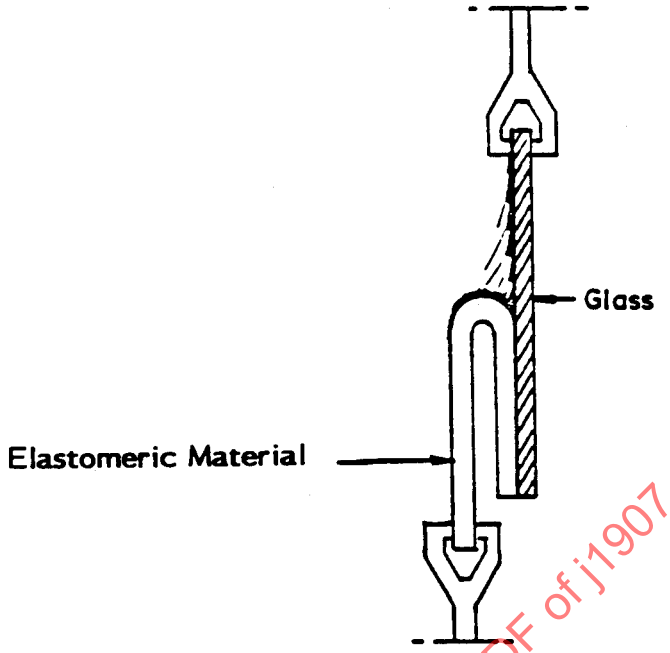


FIGURE 3—TESTING SPECIMEN ON TENSILE TESTER



**5.3** **Test Conditions—**Pull specimens at ±23 °C and 50% relative humidity or as otherwise specified.

**5.4** **Test Rate—**Test specimens shall be tested at pull rate of 50.8 mm (2 in) per minute.

**5.5** **Test Observations—**Record bond values and type of failure every 12.7 mm (0.5 in) for at least 63.5 mm (2.5in).

***6.*** ***Report***

**6.1** Complete identification of glass and elatomeric material used for encapsulation.

**6.2** Complete identification of material and procedures used for priming and cleaning glass.

**6.3** Encapsulation conditions used for molding.

**6.4** Environmental conditions prior to testing.

**6.5** Peel strength as pounds per linear inch and Newtons per linear centimeter.

**6.6** Bond values every 12.7 mm (0.5 in) for ast least 63.5 mm (2.5 in) with an average of these values.

**6.7** Type of failure every 12.7 mm (0.5 in) for at least 63.5 mm (2.5 in) with an average of these values. Abbreviations for type of failure are:

CF—Cohesive failure of elastomeric material.
AF—Adhesive failure of elastomeric material off primed glass.
PF—Primer failure off glass, if it is detectable.

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