



Tests at Joints in Weatherstrips

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 test methods for all joints in weatherstrip applications including, but not limited to, molded, mitered, wafer-spliced, and adhesively bonded joints.

1.2 Applicability. Applicable to joints in body and glass weatherstrips.

2 References

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

2.1 External Standards/Specifications.

ISO 188

ISO 7500-1

ISO 9513

2.2 GM Standards/Specifications.

None

2.3 Additional References.

Laboratory Accreditation Requirements

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.

3.2.1 Test Machine. The test machine shall fulfill the following requirements: the force-measuring device of the test machine shall correspond to ISO 7500-1 Class 1; the deflection measuring device shall correspond to ISO 9513 Class 0.2. The test machine shall be such that the required test velocity can be maintained.

3.2.2 Oven. Heating oven capable of maintaining the required temperatures within the specified tolerances (e.g., heat oven to ISO 188 Method B).

3.3 Test Vehicle/Test Piece. Finished weatherstrips or sections from weatherstrips.

3.4 Test Time. Reference the lab test procedure(s) in Section 4 for timing details.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Per laboratory accreditation requirements.

4 Procedure

4.1 Preparation.

4.1.1 Summary of Test Method.

4.1.1.1 Method A: Splice Strength. This test method is designed to determine the strength of a splice in a weatherstrip, either to itself or to a molded corner or end section. In addition, the test may be run on the complete part or on a portion of the part, i.e., the bulb section only of a dual durometer weatherstrip.

4.1.1.2 Method B: Temperature Stability for Joints. This test method is designed to determine the temperature stability of a joint in a weatherstrip.

4.1.1.3 Method C: Bending Strength of Joints. This test method is designed to determine the bending strength of a joint in a weatherstrip.

4.1.2 Test Sample Preparation.

4.1.2.1 Method A. Cut weatherstrip section approximately 150 mm in length with splice centered (i.e., approximately 75 mm on each side of splice). If only splice strength of bulb is required, detach bulb from the carrier. If not otherwise specified, a minimum of three (3) samples shall be tested.

4.1.2.2 Method B. Cut weatherstrip section approximately 100 mm in length with splice centered (i.e., approximately 50 mm on each side of splice). If not otherwise specified, a minimum of three (3) samples shall be tested.

4.1.2.3 Method C. Use complete weatherstrip or cut weatherstrip section 500 mm in length with splice centered (i.e., approximately 250 mm on each side of splice). If not otherwise specified, a minimum of three (3) samples shall be tested.

4.2 Conditions. Unless otherwise specified, the tests shall be performed at $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.

4.2.1 Environmental Conditions. The minimum time period between vulcanization and testing of elastomers shall be 72 h. The test piece shall remain at a temperature of $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ for at least 8 h before testing and shall be free from strain during this period.

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 Method A.

4.3.1.1 Clamp the weatherstrip section with the splice centered between the jaws. In addition, the specimen should be clamped in such a way that the pull is evenly distributed over the width of the splice.

4.3.1.2 Apply the load at a rate of 250 mm/minute $\pm$ 5 mm/minute.

4.3.1.3 If the weatherstrip has mitered corners, test as follows:

4.3.1.3.1 Position the jaws of test machine 25 mm $\pm$ 1 mm apart.

4.3.1.3.2 Clamp the specimen so that the splice is centered and the pull force will be evenly distributed over the full width of the specimen (see Appendix A, Figure A1).

4.3.1.3.3 Apply the load at a rate of 250 mm/minute $\pm$ 5 mm/minute.

4.3.2 Method B. Test piece shall be suspended vertically into heat cabinet. At the lower end, a weight of 1.0 kg $\pm$ 0.1 kg shall be fixed. Store for 60 minutes $\pm$ 5 minutes at $+90\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$, then expose for 72 h ($+0\text{ h}/-2\text{ h}$) at $+70\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$.

4.3.3 Method C. Sealing section shall be tested while attached to the carrier. Opening of the carrier shall be opposite the mandrel such that the carrier is under maximum stress (see Appendix A, Figure A2). Joint shall be at the center of the bent portion so that maximum stress is imparted at the joint. Bending radius shall be 150 mm $\pm$ 2 mm and bending angle shall be 180 degrees $\pm$ 5 degrees.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results.

5.2.1 Method A. Record and report the maximum forces obtained during the test. Note if any cohesive failure occurred.

5.2.2 Method B. Report if a separation of the joint occurred.

5.2.3 Method C. Report if a cracking or splitting of the joint occurred.