



Tape Lamination to Automotive Components

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 describes a daily quality procedure for running a 90 degrees peel test between the tape and the component. The quality of the bond between the tape, and the component can be determined by peel strength, and the failure mode observed. Tape attached components can include body side moldings, emblems, nameplates, body claddings, appliqués, door sill plates, fascia trim strip, wheel flares, roof ditch moldings, and other trim applications.

1.2 Applicability.

1.2.1 Raw Material Approvals. This specification applies only to substrates, adhesion promoters, and tapes that have been qualified and approved to the appropriate GM specifications.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3221

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 Ninety degree peel test equipment.

3.2.2 Roller 6.8 kg.

3.2.3 Constant rate of extension tester, Instron, or equivalent.

3.2.4 Ninety degree peel test fixture.

3.2.5 Anodized (clear, unsealed) aluminum foil, 0.125 mm x 15.9 mm x 228.75 m (0.005 in x 0.625 in x 750 ft), (Alloy AA1145, Temper H19). This foil is available from: Lawrence and Frederick, Inc., 411 E. North Avenue, Streamwood, IL, 60107, (800) 323-7540 or (630) 289-8300, or equivalent.

3.2.6 Masking tape 25 mm wide.

3.2.7 Utility knife.

3.2.8 Hand held force gauge.

3.3 Test Vehicle/Test Piece. Sections of trim part or entire trim part with tape applied per the production process.

3.4 Test Time.

Calendar time: 0 d
Test time: 25 h
Coordination time: 0 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation. All samples are to be conditioned at GMW3221, Code A prior to each test unless otherwise specified.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

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 Prepare moldings or emblems as follows:

4.3.1.1 Moldings. Cut moldings to 150 mm long sections.

4.3.1.2 Emblems. Use emblems and other smaller parts as complete assembly. Do not cut.

4.3.2 Test Procedure. Ninety degree peel adhesion of tape to trim part.

4.3.2.1 Moldings and Other Larger Parts.

4.3.2.1.1 Cut 150 mm long sections of the trim parts to be tested.

4.3.2.1.2 Cover 25 mm at the end of the trim with masking tape.

4.3.2.1.3 Using the inside edge of the masking tape as a guide, cut through the liner and tape down to the taping surface. Avoid cutting into the trim.

4.3.2.1.4 Remove the 125 mm exposed portion of liner.

4.3.2.1.5 Laminate a 200 mm long piece of anodized aluminum foil starting at the unmasked end. The foil that is not in contact with the tape should form a tab extending approximately 75 mm beyond the razor cut line. See Figure 1.

4.3.2.1.6 Roll two times with the 6.8 kg roller in the same direction.

4.3.3 Emblems and Other Smaller Parts.

4.3.3.1 Remove the liner.

4.3.3.2 Laminate a piece of anodized aluminum foil. The foil should be long enough to form a tab extending approximately 75 mm beyond the edge of the part.

4.3.3.3 Roll two times with the 6.8 kg roller in the same direction.

4.3.4 Allow trim sections to dwell at the following conditions:

- 5 minutes at room temperature (RT).
- 24 h room temperature.
- 1 h at 80 °C.
- 1.5 h at -30 °C. (Condition sample after at ambient conditions for 1 h prior to peel testing.)

4.3.5 Place the trim section (for moldings and other parts longer than 125 mm) into the 90° peel fixture in the lower jaw of an Instron or equivalent. The fixture should securely hold the section and maintain a 90 degrees angle during testing. See Figure 2.

4.3.6 Insert the aluminum foil tab in the upper jaw.

4.3.7 Initiate the upper jaw separation at a rate of 300 mm per minute. Peel the entire length of tape. Peel sections from 4.3.4 (a) and (b) at RT, from (c) at 80 °C and RT, and from (d) at -30 °C.

4.3.8 Record the average peel value for the middle 100 mm and the mode of failure.