



Test Piece Preparation for Testing of Adhesives and Sealants Applied to Body-in-White

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. Test piece preparation for testing materials applied to Body-In-White (BIW). This preparation method is typically used for testing adhesion, corrosion performance and washout resistance.

1.2 Applicability. Materials include pumpable and preformed.

- Adhesives
- Structural Foams
- Sealants

1.3 Remarks. Not applicable.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

Part Drawing

Relevant Material Specification

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.

3.1.3 Pretreatment/Electrodeposition Priming Operation (ELPO) of representative plant or laboratory pretreatment/ELPO system.

3.2 Equipment.

3.2.1 Circulation oven capable of maintaining a set temperature within ± 3 °C.

3.2.2 Cartridge gun (not required for preformed materials).

3.2.3 Cartridge nozzle with respective opening diameter.

3.2.4 Wipe or roller.

3.2.5 Balance with an accuracy of 0.01 g.

3.2.6 Ultrasonic bath required for cleaning according to 4.3.1.2.

3.3 Test Vehicle/Test Piece.

3.3.1 Number of Test Samples. As required in the relevant material specification.

3.3.2 Sheet Metal. Quality as required in the relevant material specification.

- **Approximate Size for Sheet A:** 250 mm x 100 mm x 0.8 mm.
- **Approximate Size for Sheet B:** 250 mm x 30 mm x 0.8 mm.

3.3.3 Adhesive/Sealer to be tested. For sizes see Appendix A, Table A1 and Table A2.

3.3.4 High-grade white spirit boiling range of 100 °C to 140 °C.

3.3.5 Corrosion protection oil/lubricant as required in the relevant material specification.

3.3.6 Glass spheres diameter 0.1 mm to 0.2 mm.

3.3.7 Spacer for sizes, see Appendix A, Table A1 and Table A2.

3.4 Test Time. The time required for the preparation of test pieces is variable and will depend on the number of pieces to be prepared, the amount of surface contaminant that needs to be removed and the type of cleaning solvents used. As a guideline, allow 15 minutes preparation time for each test piece.

3.5 Test Required Information. Relevant material specification for materials to be tested (e.g., adhesives, structural foams, sealants), as well as for substrate, corrosion protection oil/lubricant identification and coating weight, preconditioning, cure schedule, number of test samples, etc.

3.6 Personnel/Skills. Personnel should receive training appropriate to the operations described in this test specification. Training includes laboratory hazard awareness and safe handling of laboratory chemicals.

4 Procedure

4.1 Preparation.

4.1.1 Curing Schedule. According to relevant material specification.

4.1.2 Deviations. According to special data called out by approving engineer.

4.2 Conditions.

4.2.1 Environmental Conditions. Perform all operations in a standard laboratory environment of 23 °C ± 5 °C and 40% relative humidity (RH) ± 10% RH.

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. Report the method used for cleaning the test substrate.

4.3.1 Oily Metal Substrates. This test substrate may be required when evaluating materials that are applied directly to Body-in-White oily metal.

4.3.1.1 Test Substrate. The test substrate shall consist of flat, burr-free original body sheet metal panels or standard purchased metal test panels. Panel size shall be according to Appendix A, Figure A1. The substrate quality, corrosion protection oil/lubricants to be tested shall be according to the relevant material specification, the part drawing or the responsible engineer. The primary test substrate and the constraining test substrate, if required, shall have the same coating.

4.3.1.2 Test Substrate Cleaning. Clean test panel for at least 2 minutes at 23 °C ± 5 °C in high-grade white spirit using an ultrasonic bath. After drying, the panel must show a grey clean surface without any flow marks. Repeat cleaning operation with fresh high-grade white spirit as necessary.

Note: After cleaning, substrate oiling shall quickly follow to prevent corrosion. During all the test procedures, the test panels shall not be touched by unprotected hands.

4.3.1.3 Test Substrate Oiling. Shake the corrosion protection oil/lubricant well before removing the required oiling quantity. Test panels may be heated briefly in the drying oven to 60 °C maximum to facilitate the oil application. Then apply a few drops of oil onto the test panel and spread the oil volume evenly using a wipe or roller.

The specified oiling volume shall be checked using a balance (gravimetrically) or oil layer thickness gauge. Target coating weight of corrosion protection oil/lubricant is 3 g/m² and 1.7 g/m² for drylube unless otherwise specified in the relevant material specification.