



Procedure for Rating Weld Quality of Sonically Welded Plastic Parts

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 qualitative test procedure is used to evaluate sonically welded plastic parts. The purpose of the rating scale is to allow comparison between test plaques and vehicle components to provide consistency between personnel. It is important to recognize that rating sonic welds involves perception of an objectionable surface and much of the judgment is subjective. In developing the sonic weld scales, an attempt has been made to provide some objective measures that will guide subjective judgment.

1.2 Applicability. Typical assemblies include sonically welded spoilers, appliques, wheel opening moldings, rocker moldings, body side moldings, mud guards, fascias with welded Side Blind Zone Alert (SBZA) brackets¹, etc.

1.3 Remarks. Plastics include semi-crystalline and amorphous thermoplastics.

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

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 Pry bars or equivalent that can be used to separate the sonically welded assembly.

3.2.2 Optional: Vise or other device to assist in holding the part stationary during disassembly.

3.2.3 Optional: Band saw or equivalent.

3.3 Test Vehicle/Test Piece.

3.3.1 Sample parts must be sonically welded using production equipment unless otherwise specified. Include equipment details with incoming parts.

3.3.2 Parts are tested in the "as-received" condition.

3.3.3 When possible, tests should be conducted on whole parts.

3.3.4 When whole parts cannot be tested, they may be cut into smaller sections.

3.3.4.1 Use a band saw or equivalent to cut parts. Take care to avoid initiating any separation between the weld and substrate during cutting.

3.3.5 Label the parts.

3.3.5.1 Labeling of each weld on the assembly is required. Both sides of the weld should be numbered (inner and outer pieces). Unacceptable welds should be clearly identified including pictures within the test report.

3.4 Test Time.

Calendar time: 1 d

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Test technician familiar with test facilities and equipment.

4 Procedure

4.1 Preparation. Not applicable.

4.2 Conditions.

4.2.1 Environmental Conditions. Ambient: 23 °C, 50% relative humidity (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. Deviations shall have been agreed upon by the GM Design Release Engineer (DRE) and GM Subsystem Validation Engineer (SVE).

4.3 Instructions. A minimum of three parts must be evaluated to demonstrate consistency from part to part.

4.3.1 Using a pry bar or equivalent, force the welded assembly apart (this will often entail using a screw driver or pliers at an edge to start the failure), along with a vise or equivalent to keep the part from moving.

4.3.2 Once the separation is started, continue to peel or separate the inner from the outer (or welded part to component) along the entire part.

4.3.3 For each sonic weld, estimate the percentage of continuous weld melt based on the entire weld area. Continuous weld melt is defined as melted plastic that forms a continuous melded area as shown in Appendix A. (See Figure A1 through Figure A3.)

4.3.4 Using the Sonic Weld Quality Rating Scale, Table B1 in Appendix B, determine if any weld melt is unacceptable. Continuous weld melt of < 75% of the total welded area is considered unacceptable.

4.3.5 If any welds are deemed unacceptable, adjust the sonic weld equipment to achieve acceptable results and repeat 4.3.1 through 4.3.4.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Note any patterns from part to part (e.g., poor weld at location number 2 in all three left hand (LH) moldings).

5.3 Test Documentation. The results shall be presented in a test report.

6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

7 Notes

7.1 Glossary. Not applicable.

7.2 Acronyms, Abbreviations, and Symbols.

~	Approximately
DRE	Design Release Engineer
GSSLT	Global Subsystem Leadership Team
RH	Relative Humidity

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