



Pumpable Adhesive for Anti-flutter Applications Acceptance Criteria and Repair Procedures

1 Scope

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 provides the acceptance criteria and repair procedures for pumpable adhesive(s) for anti-flutter applications in automotive products for which GM is responsible for establishing or approving product design.

1.2 Applicability. This standard applies to any application where an adhesive intended for use in the body shop is used for bonding exterior automotive body panels for anti-flutter.

The criteria established in this standard become mandatory when referenced in product release information or an approved Product Quality Standard (PQS) document. Deviations from any adhesive criteria provided in this standard must be identified in product release information or an approved PQS document.

1.3 Usage. Structural bonds are considered satisfactory when they meet the performance requirements, defined in the material specifications. Service loads on structures containing adhesive in a vehicle are varied in both type and magnitude and cannot be addressed by this standard. Therefore, while the adhesive quality criteria of this standard are consistent with service loading requirements, they have been established specifically for use in process and product monitoring. Any attempted application of this document to other uses, such as post-crash quality assessment, may lead to an erroneous result or conclusion. Discrepant adhesive applications may still contribute to the integrity of the assembly by retaining a portion of their engineering properties.

1.4 Clarification. For clarification of this standard or editorial comments, email the GM Weld Council at: weld.council@gm.com.

Proposed changes to this standard must be presented to the Global Weld Council. To suggest a change to this standard, reference the "Procedure for Weld Standard Changes" on the Weld Council's web page.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15563

2.3 Additional References.

- GMS Operating Guidelines and Global Launch Manual, Section B4
- Procedure for Weld Standard Changes

3 Requirements

3.1 General Acceptance Criteria.

3.1.1 Correct Material. The anti-flutter adhesive applied shall be the material specified in the design release documentation and/or the Process Data Sheet for Sealer Application (see Appendix A, Figure A1). The product is non-conforming if incorrect material is being applied.

3.1.2 Substrate Condition. Cleaning of the faying surfaces is not required unless visibly contaminated by dirt, dust, corrosion, or other foreign matter. Preparation of the faying surfaces is not required unless specified in the material specifications.

3.2 Visual Acceptance Criteria.

3.2.1 Location. The bead or gum drop position on the flange is properly located when installed within 6 mm from the location indicated in the design release documentation and/or the Process Data Sheet. Beads or gum drops not properly located require the process to be adjusted to eliminate the condition. Bead position across the flange may be adjusted to achieve wet out and to minimize or eliminate excess material squeezed out of the joint. Missing or mislocated beads cause the product to be non-conforming.

3.2.2 Wet Out. Wet out is defined as the "footprint" of adhesive surface area on each of the flanges in a joint that the adhesive covers. It is required that both flange surfaces exhibit evidence of adhesive contact (flattening of the dispensed bead) after separation. Actual transfer of adhesive during this separation may, or may not occur. On flange surfaces that do not exhibit some evidence of adhesive "footprint" on both flanges, the process is to be adjusted to eliminate the condition.

3.2.3 Wet Out Width. The wet out width is to be a minimum $1\frac{1}{2}$ times to a maximum of 2 times the average gap between surfaces to be joined. It is to be measured on the bead application flange surface at the narrowest place. If the wet out width is less than $1\frac{1}{2}$ times or more than 2 times the average gap between surfaces at the narrowest place, then the bead is to be adjusted to eliminate the condition.

3.2.4 Voids, Skips or Interruptions. Adhesive voids, skips or interruptions are discontinuities and cannot be counted in the effective bond line length.

3.3 Measurable Acceptance Criteria.

3.3.1 Effective Bond Line Length (Le). Adhesive bond lines that have an effective length greater than or equal to the minimum required length (as described in Table 1) are acceptable provided that the maximum allowable discontinuity value listed in Table 1 is not exceeded. Adhesive bond lines that do not have an effective bond line length greater than or equal to the minimum required length (as described in Table 1) are non-conforming and the process is to be adjusted to eliminate the 3.4 Disposition/Repair Procedure.

Table 1: Bond Line Length Requirements ^{Note 1}

Specified Bond Length (mm) L_w	Maximum Allowable Length (mm) for any Single Discontinuity (post wet out)	Length Tolerance (mm) L_t	Minimum Required Length (mm) L_r
< 30	0	presence	N/A
30 to 150	$8 + 2$ for every additional 20 mm ^{Note 2}	20% of L_w	$L_w - L_t$
> 150	30		

Note 1: Effective Bond Length is defined as $L_e = L_a - L_d$.

Where:

L_e = Effective Bond Length

L_a = Actual Bond Length

L_d = Combined discontinuity lengths

Note 2: A single discontinuity may not exceed 30 mm for any bead.

3.4 Disposition/Repair Procedure.

3.4.1 Disposition. All known and suspect product with non-conforming anti-flutter adhesive applications must be repaired. Refer to Appendix B, Table B1 to determine when an anti-flutter adhesive application is non-conforming. When required, sealer applications shall be repaired according to the procedures specifically authorized by the appropriate Product Engineer.

3.4.2 Repair Procedure. Beads or gum drops that are non-conforming with this standard can be repaired with suitable methods, e.g., placement of a new bead or gum drop of adhesive conforming to this standard.