



ADHESION REQUIREMENTS, BONDING ELASTOMERS TO RIGID SUBSTRATES, ENGINE MOUNT APPLICATIONS

WSS-M11P61-A

1. SCOPE

This specification defines the adhesion requirements of bonding systems used for attaching elastomers to rigid substrates.

2. APPLICATION

This specification was released originally for adhesive systems used to structurally bond natural rubber to uncoated HRLC steel during fabrication of engine mounts.

Compliance with this performance specification does not guarantee an adhesive system will function for all potential applications on a vehicle. The specific design condition should be evaluated by a functional trial or laboratory simulation prior to release.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements for Production Materials (WSS-M99P1111-A).

3.2 ADHESION TESTS, STANDARD SPECIMENS

(ASTM D429, Method B)

Adhesion values and failure mode percentages shall be obtained from 45 degree or 90 degree stripping tests performed on bonded specimens. At least 3 specimens shall be subjected to each of the following test conditions. The average adhesion (in N/mm) in the as-received condition and tested at 23 °C shall be considered the original adhesion value. The averaged adhesion values for every other test condition described under paragraph 3.2 shall be reported as a percentage of the original value.

	TEST CONDITIONS	ADHESION	FAILURE MODE
3.2.1	Test at 23 +/- 2 °C	No Requirement (original)	R-90 min (Worst Case)
3.2.2	Test at -40 +/- 2 °C	min 50% of original	R-75 min (Worst Case)
3.2.3	Test at 100 +/- 2 °C	min 50% of original (After 16 h at temp)	R-75 min (Worst Case)
3.2.4	After 240 h of Salt Spray	min 50% of original per ASTM B117	R-50 min (Worst case)
3.2.5	After 168 h of Heat Aging	min 50% of original At 100 +/- 2 °C per ASTM D573	R-75 min (Worst Case)

Date	Action	Revisions	Rev. 2
2015 01 30	Re-activate		R. Thomas NA
2013 12 12	N-Status	N Status, No replacement named.	J. Sinclair NA
1996 09 04	Activated		A. Novakovic, K. Gribb



3.2.6	After 168 h immersion In hydraulic fluid at 125 °C per ASTM D471	min 50% of original (Worst Case)	R-50 min
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NOTE: The requirements of section 3.2.6 apply only to adhesive systems used in the fabrication of hydraulic engine mounts.

3.3 ADHESION TESTS, COMPONENT PARTS (ASTM D429, Method B)

Adhesion values and failure mode percentages shall be obtained from component testing whenever feasible. Tensile tests shall be performed on bonded, production-representative components in accordance with test methods specified for that part (usually on the part print). Adhesion values shall be reported as percentages of minimum draw pull load requirements specified for that part. At least 3 specimens shall be subjected to each of the following test conditions.

	TEST CONDITIONS	ADHESION	FAILURE MODE
3.3.1	Test at 23+/- 2°C	100%	R-50 min (Worst Case)
3.3.2	Test at -40+/- 2°C	50%	R-50 min (Worst Case)
3.3.3	Test at 100+/- 2°C (After 16 h at temp)	50%	R-50 min (Worst Case)
3.3.4	After 240 h of Salt Spray Per ASTM B 117	50%	R-50 min (Worst case)
3.3.5	After 168 h of Heat Aging At 100 +/- 2°C Per ASTM D 573	50%	R-50 min (Worst Case)
3.3.6	After 168 h immersion In hydraulic fluid at 125 +/-2°C Per ASTM D471	50%	R-50 min (Worst Case)

NOTE: The requirements of paragraph 3.3.6 apply only to adhesive systems used in the fabrication of hydraulic engine mounts.

- 3.4 If agreed upon by the responsible releasing activity, requirements described in paragraph 3.4 for standard specimens may be omitted if the requirements described in paragraph 3.5 for component parts are met.

4. GENERAL INFORMATION

The information given below is provided for clarification and assistance in meeting the requirements of this specification. Contact gmfs@ford.com for questions concerning Engineering Material Specifications.

- 4.1 This specification requires identification of all materials which are part of a specific bonding system. This includes the hydraulic fluid (engine mount fluid--usually glycol-based) for bonding systems used in the fabrication of hydraulic engine mounts. The intent is to uniquely identify the bonding system without compromising processes, conditions or compounds considered proprietary by the supplier.