



Foam, Structural, 2-Component, Urethane - Mixture

1 Scope

This specification covers the requirements of a two component structural foam which may be applied prior to paint on clean, dry metal and used for structural reinforcement of body cavities such as pillars, rails and other areas where lightweight structural enhancement may be required during impact events. This material may be baffled in order to inhibit expansion into areas of the body cavity where no structural reinforcement is required, or where holes for attachment of trim pieces or other parts are located. While this material yields structural integrity to existing steel structure, it may not be considered as a main structural component for ride enhancement. It must be capable of bonding to cleaned or primed metal.

1.1 Material Description. This material is a two component material, comprising of a resin component (9982294) and an isocyanate curative (9982227). The mixture of 9982294 and 9982227 is identified as 9982296.

1.2 Symbols. Not applicable.

1.3 Applicability. Structural reinforcement of body cavities during impact events. This material is not recommended for ride and handling enhancement.

1.4 Remarks. Adhesion of this material can only be achieved on a clean, dry substrate or substrates with E-coated or painted surfaces where wet (unreacted) foam contacts the substrate during dispensing.

It is recommended that this material be used on clean, dried bare metal above the belt line only. Below the belt line applications should be on E-coated surfaces.

This system must be capable of being metered, mixed and dispensed with current production equipment.

The cured product must be compatible with production phosphate, E-coat and topcoat systems, and shall not be adversely affected by bake temperatures up to 190 °C.

2 References

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

2.1 External Standards/Specifications.

ASTM D570	ASTM D1621	ASTM D3574	SAE J369
ASTM D638	ASTM D2126	ASTM E1640	SAE J1756

2.2 GM Standards/Specifications.

9982227	GMW8	GMW14093	GMW15477
9982294	GMW11	GMW14124	GMW15735
GMW2	GMW3059	GMW14729	GMW16656

3 Requirements

3.1 Cleaner and Phosphate Compatibility. The materials must be compatible with all cleaner and phosphate processes used in assembly plants.

3.2 E-coat Compatibility (GMW16656). Test per GMW16656 Method 3, Rating of 1 or 2.

3.3 Odor. The uncured structural materials must not have a toxic or noxious odor. After curing, the material must be relatively non-odorous.

3.4 Stability (GMW15735). Material conditioned using potential storage conditions must be capable of passing all the requirements of this specification.

3.5 Toxicity. The toxicity shall be disclosed, in kind and magnitude, as required by the GM Material Safety Data Sheet.

3.5.1 The foam must not adversely affect those personnel handling it, when handled according to safe and established guidelines.

3.6 Substrates. The following substrates must be used for passing the requirements of this specification:

Steel substrates – All steel panels to be prepared according to GMW15477.

- (I) Cold Rolled Steel: GMW2M-ST-S U
- (II) Electrogalvanized (GMW11): GMW2M-ST-S EG60G60GE
- (III) Hot Dipped Galvanized (GMW8): GMW2M-ST-S HD70G70GU

Aluminum substrates – All aluminum panels to be prepared according to GMW15477

- (I) UNS A96111

3.7 Test Preparation. Three (3) panels per substrate per environmental condition outlined in 3.8 shall be made.

3.8 Adhesion. A 250 mm x 100 mm (approximately 10 in x 4 in) U-channel, baffled at the ends, shall be filled with foam. Areas of the trough where wet (unreacted) foam contacts the substrate must not lose adhesion to substrate during or after exposure to the following conditions:

- Initial
- GMW14124 Cycle H - 2 cycles
- Humidity (GMW14729), 168 h at 38 °C/100% RH
- Cold Impact per GMW14093 Apparatus C, Code 3, minimum 1.7J

Additionally, the foam must not crack or decompose and must exhibit cohesive failure in areas where the wet (unreacted) foam contacted the substrate during dispensing.

3.9 Dimensional Stability (ASTM D2126). Percent volume change, maximum:

- 28 days at -15 °C 3%
- 28 days at 38 °C, 100% RH 3%
- 28 days at 70 °C, 100% RH 3%
- 28 days at 70 °C, dry 3%
- 28 days at 23 °C, ambient 3%

3.10 Flammability (SAE J369). Cured material shall be tested per SAE J369. All samples must be self-extinguishing.

3.11 Fogging (SAE J1756). Fogging shall be tested in accordance with SAE J1756, 3 h at 100 °C, 21 °C cooling plate, posttest conditioning 1 h and 16 h. Material shall have a minimum fogging number of 90.

3.12 Cured Material Properties. See Table 1.

Table 1: Material Properties

Property	Value	Test Method
Density, 50 mm x 50 mm x 25 mm (2 in x 2 in x 1 in) skinless sample ^{Note 1}	345 kg/m ³ to 422 kg/m ³	ASTM D3574
Tack Free Time	130 s to 180 s	Not applicable
Water Absorption, 24 h immersion, 76 mm diameter x 25 mm thick (3 in diameter x 1 in thick) sample	1.0% maximum	ASTM D570
Expansion Range 50 mm x 50 mm x 25 mm (2 in x 2 in x 1 in) skinless sample ^{Note 2}	177% to 216%	ASTM D3574
Compressive Strength 50 mm x 50 mm x 25 mm (2 in x 2 in x 1 in) skinless sample ^{Note 1}	7.5 MPa minimum	ASTM D1621
Compressive Strain (at start of crack propagation) ^{Note 1, Note 3}	0.50 mm/mm minimum	ASTM D1621
Compressive Stress (at start of crack propagation) ^{Note 1, Note 3}	15 MPa minimum	ASTM D1621

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Page 2 of 4



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