



Closed-Cell, Foam-In-Place, Thermoplastic Sealer

1 Scope

1.1 Material Description. This specification covers the requirements for a closed cell, foam-in-place thermoplastic material to be used as a seal against air, dust, and water. The material may also be used for certain applications as a gasket or rattle isolator. Materials meeting the requirements of this specification will be comprised of two (2) classes and several types.

- **Class I:** Materials will be used for air, dust and rattle isolators.
- **Class II:** Materials will be used for water sealing and must meet the water impermeability requirements of this document.

Materials are divided into types, depending on chemistry.

- **Type I:** Thermoplastic Rubber Based Material.
- **Type II:** Thermoplastic Urethane Based Material.
- **Type III:** Other technology to be called out on drawing.

1.2 Symbols. Not applicable.

1.3 Applicability. Materials to be used as air and dust seals or water seals and gaskets in the body area and for rattle protection and other suitable applications.

1.4 Remarks.

1.4.1 The material must not stain, attack, or have any other objectionable effect on adjacent surfaces.

1.4.2 This material is foamed through the introduction of an inert gas, such as nitrogen, carbon dioxide, or compressed air to a specific density reduction. The material is allowed to cool with the gas bubbles intact and a closed cell foam product is formed. Density reduction denotes the percentage of inert gas content. The amount of density reduction/gas content must be specified on the drawing.

2 References

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

2.1 External Standards/Specifications.

FMVSS 302	ISO 1431-1	ISO 3386-1	ISO 23529
ISO 815-1	ISO 1798	ISO 3865	SAE J1389
ISO 845	ISO 2781	ISO 8510-2	

2.2 GM Standards/Specifications.

9985670	GMW3221	GMW3286	GMW15634
GMW3059	GMW3232	GMW14162	
GMW3205	GMW3235	GMW14650	

3 Requirements

3.1 Test Preparation and Evaluation.

3.1.1 Test Samples. Unless otherwise specified, the shape, size, and number of the test pieces shall be in accordance with the relevant test procedures.

3.1.1.1 All materials tested to this specification shall be conditioned for 24 h according to GMW3221 Code B. The minimum time between dispensing and testing of samples shall be 72 h.

3.1.2 Conditioning. Conditioning shall be as specified in the relevant test methods.

3.1.3 Equipment. Conforming to the relevant test procedure and to the test sketches on the part drawings.

3.1.4 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.5 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this specification shall be determined correctly with respect to its physical definition.

3.1.6 Facilities. Conforming to the relevant test methods.

3.1.7 Deviations. Deviations from the requirements of this specification shall have been agreed upon. Such deviations shall be specified on component drawings, test certificates, reports, etc.

3.1.8 Conditions. The minimum time between manufacturing and testing shall be 72 h.

3.1.8.1 Environmental Conditions. Not applicable.

3.1.9 Documentation. Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM department prior to the start of delivery of production level components or materials.

Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacture, raw material relocation change requires a new release of the product. It is the sole responsibility of the supplier to provide the customer, unsolicited, with documentation of any change or modification to the product/process, and to apply for a new release.

If not otherwise agreed to, the entire verification test shall be repeated and documented by the supplier prior to start of delivery of the modified or changed product. In some cases, a shorter test can be agreed to between the responsible GM department and the supplier.

3.1.9.1 Test Results. With reference to this standard, the test results shall be presented in a test report.

3.2 Requirements and Procedures.

Table 1: Material Requirements

Property	Test Method	Unit	Value
Density			
All Types	ISO 2781 or ISO 845	g/cm ³ kg/m ³	To be reported
Compression Deflection			
All Types	ISO 3386-1 Values shall be determined after one (1) minute of a single 50% compression on unplied material (no preflex) after being compressed at a rate of 50 mm/minute Samples shall be 50 mm × 50 mm with a minimum sample thickness of 3.2 mm. Note: If sample cannot be die cut, then dispense a bead that represents the maximum thickness available, and document size in the test report.	KPa	To be reported

Property	Test Method	Unit	Value
Water Absorption			
All Types	Samples shall be weighed and then submerged for 24 h, 50 mm below the surface of distilled water. After the 24 h period has elapsed, the samples shall be removed from the water and quickly blotted to remove surface moisture. The samples will be immediately reweighed. Samples shall be 50 mm × 50 mm with a minimum sample thickness of 3.2 mm. Five (5) samples to be tested. Note: If sample cannot be die cut, then dispense a bead that represents the maximum thickness available, and document size in the test report.	% by mass	10% Maximum
Tensile Strength			
All Types	ISO 1798	kPa	To be reported
Elongation			
All Types	ISO 1798, Type 1	%	100 Minimum
Cold Resistance			
All Types	Condition per ISO 23529, -30 °C ± 3 °C; 4 h, -0.5 h, then bend in cold condition 180 degrees around mandrel with radius of 10 mm Visual Examination		No cracks
Ozone Resistance			
Exterior Applications Only	ISO 1431-1; 100 pphm ± 10 pphm for 72 h, -2 h at 40 °C ± 2 °C Remove samples from chamber and wrap around a 25 mm diameter mandrel		No cracking or other indication of material breakdown
Paint Staining			
Exterior Applications Only	ISO 3865, Method A, 24 h +0 h, -2 h at 80 °C ± 3 °C, using production representative painted panels. Basecoat shall be white. To develop latent stain, the panels shall be exposed to ultraviolet (UV) following the heat exposure. Either: UV exposure 4 h ± 0.5 h at 13 W/m ² ± 2 W/m ² Or: GMW14162/B/4 MJ/m ² minimum For parts with permanent contact to the body For parts when contact area is visible		No migration stain permissible; Contact stain permissible No staining permissible
Compatibility with Solvents			
Exterior Applications Only	Materials should be immersed for 10 minutes in: 50/50 Isopropanol/water 9985670 (Windshield Washer Solvent) Visual Examination		The material must show no signs of tackiness, surface deterioration, swelling, or other detrimental effects