



Polyurethane, 49 % Continuous Glass Fiber Mat, 8500 MPa Flexural Modulus

1 Scope

This specification covers the properties of a paintable structural reaction injection molded (SRIM) Polyurethane molding compound reinforced with 49 % continuous glass fiber mat.

1.1 Material Description.

Paintability. Approved paint systems that can be used on this material are listed in the GM Approved Paint On Parts Systems (GM APOPS) data base.

1.1.1 Material Identification. The molding compound shall be identified by the specification code, the manufacturer's identification code and lot number, along with any additional vehicle group and component division requirements.

1.2 Cross-Reference of Replaced Specifications. Subparagraphs were not applicable.

1.3 Symbol. Not applicable.

1.4 Typical Application. Not applicable.

1.5 Remarks. Not applicable.

2 References

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

2.1 Normative.

ASTM D696	ASTM E831
ISO 178	ISO 527
ISO 1183	ISO3451/1

2.2 GM.

GMW3001

GMW3059

3 Requirements

3.1 Requirements on Delivery.

Test Procedures. Tests shall be conducted using the latest issue of the test methods indicated. Suitable precautions should be taken to ensure that applicable safe limits are not exceeded when conducting test procedures, processes, and/or handling the materials required by this specification.

Properties shall be determined using test specimens router cut from center gated reaction injection molded test plaques that have been post cured by baking for 45 minutes at 121 °C within 8 h of molding. The plaques shall be 250 x 300 x (3.5 ± 0.2) mm minimum.

Tests shall be conducted 40 h minimum after post cure and immediately following a conditioning period of 24 h minimum at (22 ± 3) °C and (50 ± 5) % RH unless otherwise specified.

An equal number of specimens shall be cut from both the longitudinal and transverse plaque directions for each mechanical property. The specimens shall be tested and the results averaged. The value is compared to the required value shown in the Compound Properties table(s).

Compound Certification. Material suppliers must certify molding compound properties to the specific GM Test Sampling Plan approved for their material.

Compound Properties (Natural and Black). See Table 1.

Table 1: Compound Properties (Natural and Black)

Properties	Test Values	Test Methods
Glass Fiber Reinforcement	47 – 51 %	ISO 3451/1 Time 2 h at Temp. 600 °C, Method A.
Mineral Filler (exclusive of carbon black)	N/A	ISO 3451/1 Time _____ at Temp. _____ Method _____.
Specific Gravity	1.4 – 1.6	ISO 1183, Method A
Flexural Modulus at –30 °C 0.5 mm deflection 2.5 mm deflection at +22 °C 0.5 mm deflection 2.5 mm deflection at +70 °C 0.5 mm deflection 2.5 mm deflection	7860 MPa max 7300 MPa max 8045 – 9510 MPa 7700 – 9300 MPa 5170 MPa min 5340 MPa min	ISO 178 80 x 25 x 3.5 mm specimen 50 mm span, 10 mm/min secant calculation
Flexural Strength at +22 °C after 7 days in 100 % RH at 38 °C	198 MPa min 151 MPa min	ISO 178 80 x 25 x 3.5 mm specimen 50 mm span, 10 mm/min
Tensile Strength at Break	108 MPa min	ISO 527 Type 1B specimen, 5 mm/min
Coefficient of Linear Thermal Expansion	24.4 E-06/C max	ASTM D696 or ASTM E831 -30 to +30 °C

3.1.1 Chemical Requirements. Not applicable.

3.1.2 Mechanical Requirements. Not applicable.

3.1.3 Physical Requirements. Not applicable.

3.1.4 Additional Requirements. Not applicable.

3.2 Processing Requirements. Subparagraphs were not applicable.

3.3 Performance Requirements.

Suggested Compound Verification. Inherent compound properties and test procedures that may be used to identify this material are listed below. The test value and test procedure requirements are identical to those listed in Section 3.1, **Compound Properties**.

Glass Fiber Content
Infrared Characterization Scan
Specific Gravity

3.3.1 Chemical Requirements. Not applicable.

3.3.2 Mechanical Requirements. Not applicable.

3.3.3 Physical Requirements. Not applicable.

3.3.4 Additional Requirements. Not applicable.

3.4 Requirements on other Stages during Life Cycle. Subparagraphs were not applicable.

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Rules and Regulations for Material Specifications. All materials supplied to this specification must comply with the requirements of GMW3001, **Rules and Regulations for Material Specifications**.

5.2 Restricted and Reportable Substances for Parts. All materials supplied to this specification must comply with the requirements of GMW3059, **Restricted and Reportable Substances for Parts**.