

**Polyurethane, 47 % Glass Fibers, Directed Preform, 9000 MPa Flexural Modulus****1 Scope**

This specification covers the properties of a paintable structural reaction injection molded (SRIM) Polyurethane molding compound reinforced with 47 % glass fibers in the form of directed preforms.

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.

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

1.3 Symbol. Not applicable.

1.4 Typical Application. Typical applications include the following: Pickup box, endgate assembly inner panel.

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	ISO 3451/1

2.2 GM.

GMW3059

3 Requirements**3.1 Requirements on Delivery.**

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.

3.1.4.1 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.

3.1.4.1.1 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 mm minimum x (3.5 ± 0.2) mm.

3.1.4.1.2 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.

3.1.4.1.3 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 average value is the material property value. This value is compared to the required value shown in the Compound Properties table(s).

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

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

Table 1: Compound Properties (Natural and Black)

Properties	Test Values	Test Methods
Glass Fiber Reinforcement	40 – 54 %	ISO 3451/1 Time 2 h at Temp. 600 °C Method A
Mineral Filler (exclusive of carbon black)	Not applicable	Not applicable
Specific Gravity	1.5 – 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	11 650 MPa max 11 100 MPa max 7570 – 11 070 MPa 7330 – 10 570 MPa 6150 MPa min 6440 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	234 MPa min 217 MPa min	ISO 178 80 x 25 x 3.5 mm specimen 50 mm span, 10 mm/min
Tensile Strength at Break	142 MPa min	ISO 527 Type 1B specimen, 5 mm/min
Coefficient of Linear Thermal Expansion	21 E-06/ °C max	ASTM D696 or ASTM E831 -30 to + 30 °C

3.2 Processing Requirements. Subparagraphs were not applicable.

3.3 Performance Requirements. Subparagraphs were 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 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.**

5.2 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.

5.3 Inspection and Rejection. The purchaser reserves the right to sample incoming shipments even though it is the responsibility of the supplier to meet the requirements stated without dependence upon the purchaser's inspection. The supplier (whether prime contractor or subcontractor) will forfeit qualification if a change is made in material, processing methods, testing methods, or location of manufacture without prior written request to and subsequent approval from the purchaser.

6 Approved Sources

Engineering qualification of an approved source is required for this specification. Only sources listed in the GM Materials File (i.e., MATSPC) under this specification number have been qualified by engineering as meeting the requirements of this specification.