



Polypropylene, Glass Fiber-Reinforced, Weatherable In-Line Compounded

1 Scope

1.1 Material Description. This standard covers the properties of polypropylene, homopolymer or copolymer, weatherable, that are in-line compounded with long glass fiber reinforcement and injected into a mold or extruded directly into a compression molding process.

1.2 Symbols. The material abbreviation per ISO 11469 is > PP - GFXX <. The symbol shall be completed by the supplier per the Glass Fiber (GF) content of the material.

1.3 Applicability. Exterior Panels, End-Gate Cover.

1.4 Remarks. None.

2 References

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

2.1 External Standards/Specifications.

ASTM G147	ISO 6603-2	ISO 1183:87	SAE J1976
ISO 75	ISO 11469	LSTM 002	SAE J2527
ISO 527			

2.2 GM Standards/Specifications.

GMW3059	GMW14270	GMW14650	GMW16853
GMW3221	GMW14444	GMW15725	

2.3 Additional References. None.

3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221. Unless otherwise specified, all specimens for test shall be obtained from compression-molded plaques with a thickness of (2.5 mm ± 0.5 mm).

All tests shall be performed on specimens 40 h minimum after molding and immediately following a conditioning period of 24 h minimum in a controlled atmosphere per GMW3221, Code A, unless otherwise specified. All test shall be performed on unannealed specimens.

3.1.1 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media the part shall come in contact with at the intended place of use.

3.2 Emissions Testing of Interior Materials and Parts. For all Code E designated parts per GMW14444, reference GMW16853 for emissions testing of interior materials and parts.

3.3 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to obtain a GM-approved International Material Data System (IMDS) submission.

3.4 Requirements on Materials. See Table 1 and Table 2.

3.5 Performance Requirements. All finished parts for Interior applications shall meet the requirements per GMW14444. All finished parts for Exterior applications shall meet the requirements per GMW14650. All finished parts for Engine Compartment applications shall meet the requirements per GMW15725.

3.6 Compound Properties. The following are also required for full specification approval, with a minimum of one lot per required test: Poisson's Ratio, Stress Strain Curve at +23 °C, +85 °C, -30 °C; Differential Scanning Calorimetry (DSC) Curve; and Infrared Spectroscopy Curve.

Table 1: Compound Properties

Property	Standard	Unit	Glass Fiber (GF) Content (%)		
			20	30	40
Ash	LSTM 002	%	-	30 ± 3	-
Density	ISO 1183:87, Method A	-	-	1.1 ± 0.1	-
Tensile Strength at Break	ISO 527, Type 1B specimen 5 mm/minute	MPa	-	≥ 50	-
Tensile Modulus	ISO 527, Type 1B specimen 5 mm/minute	MPa	-	≥ 3600	-
Multiaxial Impact @ 23 °C, 6.6m/s	ISO 6603-2	J	-	> 23	-
Multiaxial Impact @ -30 °C, 6.6 m/s	ISO 6603-2	J	-	> 25	-
Tensile Strength after Heat Aging 1000 h at 140 °C	ISO 527, Type 1B specimen 5 mm/minute	MPa	-	≥ 49	-
Deflection Temperature Under Load, 1800 kPa, Method A	ISO 75, Method A Edgewise	°C	-	> 148	-
Natural Weather Resistance Color Change Surface Defects	Static Exterior Weathering/Miami, FL ASTM G147. 2 Year Exposure	-	ΔE ≤ 3.0 No objectionable defects	ΔE ≤ 3.0 No objectionable defects	ΔE ≤ 3.0 No objectionable defects
Natural Weather Resistance Color Change Surface Defects	SAE J1976, Procedure A Direct, Open-backed, 5 degrees South in Arizona, 2 Year Exposure	-	ΔE ≤ 3.0 No objectionable defects	ΔE ≤ 3.0 No objectionable defects	ΔE ≤ 3.0 No objectionable defects

Note: @ = at, °C = degrees Celsius, Δ = Delta, % = percent/percentage, FL = Florida, J = Joule(s), MPa = Megapascal(s).