



Polypropylene, Glass Fiber Reinforced, In-line Compounded

1 Scope

1.1 Material Description. This standard covers the properties of polypropylene, homopolymer or copolymer, 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 according to ISO 11469 is > PP – GFXX <. The symbol shall be completed by the supplier according to the Glass Fiber (GF) content of the material.

1.3 Applicability. Typical applications include underbody panels, chassis shields, and splash shields.

1.4 Remarks. Classifications are grouped according to the different ranges of glass fiber content.

2 References

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

2.1 External Standards/Specifications.

ISO 75	ISO 527-2	ISO 3451-1	ISO 11469
ISO 527-1	ISO 1183	ISO 6603-1	SAE J1686

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW14444	GMW15725
GMW3059	GMW14270	GMW14650	GMW16853

3 Requirements

Materials approved to this specification shall meet the requirements of GMW3013, **General Requirements for Handling of Technical Terms of Delivery for Plastics.**

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 ± 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 tests shall be performed on unannealed specimens. Five (5) coupons minimum shall be tested. The average value is the material property value.

3.1.1 Chemical Requirements. All parts manufactured from molding compounds shall be resistant to the media they contact at their place of use.

3.2 Requirements on Delivery. The physical, mechanical and thermal properties that characterize the material are summarized in Table 1.

Note: The requirements in Table 1 shall be documented for self-certification of the product according to GMW3013. The color shall be specified on drawings, in material specifications, and otherwise.

3.3 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.

3.4 Requirements on Materials. See Table 1.

3.5 Performance Requirements. All finished parts for Interior applications shall meet the requirements according to GMW14444. All finished parts for Exterior applications shall meet the requirements according to

GMW14650. All finished parts for Engine Compartment applications shall meet the requirements according to 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; DSC Curve; and Infrared Spectroscopy Curve.

Table 1: Compound Properties

Property	Standard	Unit	Glass Fiber Content (%)		
			20	30	40
Ash	ISO 3451-1, Method A	% by Mass	20 ± 3	30 ± 3	40 ± 3
Density	ISO 1183, Method A	g/cm ³	1.04 ± 0.04	1.12 ± 0.04	1.23 ± 0.04
Tensile Strength at Break ^{Note 1}	ISO 527-1, ISO 527-2, Specimen A, Test Speed 5 mm/minute	MPa	≥ 35	≥ 45	≥ 55
Tensile Modulus ^{Note 1}	ISO 527-1/2	MPa	≥ 2700	≥ 3000	≥ 4000
Multiaxial Impact at +23 °C, 6.6 m/s	ISO 6603-1/2 Total Energy, Sample Size 60 mm × 60 mm	J	≥ 7	≥ 10	≥ 15
Multiaxial Impact at -30 °C, 6.6 m/s	ISO 6603-1/2 Total Energy, Sample Size 60 mm × 60 mm	J	≥ 6	≥ 8	≥ 12
Tensile Strength after Heat Aging 1000 h at 140 °C	ISO 527-1, ISO 527-2, Specimen A, Test Speed 5 mm/minute	% Retention	≥ 75	≥ 75	≥ 75
Deflection Temperature Under Load, 1800 kPa, Method A	ISO 75 (refer to SAE J1686), flatwise	°C	≥ 145	≥ 150	≥ 150

Note 1: Requirements for samples taken from plaques irrespective of flow direction.

3.7 All materials supplied to this standard must comply with GMW3059, **Restricted and Reportable Substances**, including the requirement to submit a full material composition disclosure to GM via the International Material Data System (IMDS) or via a completed GMW3059 report form.

4 Manufacturing Process

Not applicable.