



PBT+PET - Glass Fiber/Mineral Reinforced, Weatherable, Heat Stabilized

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose/Material Description. This specification covers the properties of injection moldable, weatherable, heat stabilized Polybutylene Terephthalate (PBT) and Polyethylene Terephthalate (PET) with glass and mineral filler.

1.2 Symbols. The material abbreviations according to ISO 11469 are shown in Table 1.

1.3 Applicability. Typical applications include: Windshield wiper airfoil.

1.4 Remarks. The classification into groups is according to the different ranges of glass fiber/mineral content. Additional glass/mineral ranges will be added as necessary.

2 References

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

2.1 External Standards/Specifications.

ASTM E831	ISO 294-3	ISO 3146	ISO 20028-2
ISO 75-2	ISO 294-3/4	ISO 3451	SAE J1976
ISO 179-1/1eA	ISO 527	ISO 11357-3	SAE J2527
ISO 188	ISO 527-1/2	ISO 11359-2	
ISO 294	ISO 1183	ISO 11469	

2.2 GM Standards/Specifications.

GMW3013	GMW3059	GMW3221	GMW14270
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2.3 Additional References.

Plastic Submission Template

3 Requirements

3.1 Requirements on Test Specimens. Materials approved to this specification shall meet the requirements of GMW3013.

Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding from ISO 20028-2. Test methods and specimen dimensions are also to be in accordance with ISO 20028-2.

All tests shall be performed on unannealed specimens immediately after their removal from the containers in a controlled atmosphere per GMW3221, Code A, unless otherwise specified. In addition, tests specified at temperatures below or above $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ shall be conducted at the specified temperature using specimens conditioned at the specified temperature for 4 h minimum.

The values specified in Table 1 shall be met by test specimens in natural, black, or in a standard sampled color, if natural or black are not available. The values specified in Table 2 shall be met by one specific exterior color for approval to the specification, and by test specimens in specific colors as required during color development.

3.2 Requirements on Delivery. Important physical, mechanical and thermal properties that characterize the material are summarized in Table 1 and Table 2. The color shall be specified on drawings, in material specifications and otherwise.

3.3 Compound Properties (Natural, Black and Integrally Colored). See Table 1 and Table 2. The following are also required for full approval. The minimum number of lots per test required is one unless otherwise specified. See the Polyester tab on the Plastic Submission Template (contact specification owning group named in Section 6 for access) and GMW3013 for test details and parameters.

- Poisson's Ratio
- Stress/strain data points and curves at the following temperatures: -30 °C, +23 °C, +85 °C

Note: See GMMPD tab on Plastic Submission Template for test details (contact specification owning group named in Section 6 for access).

- Coefficient of Linear Thermal Expansion (CLTE) data

Note: See GMMPD tab on Plastic Submission Template for test details (contact specification owning group named in Section 6 for access).

- Differential Scanning Calorimetry (DSC) curve
- Fourier Transform Infrared (FTIR) spectroscopy curve
- Mold shrinkage

3.4 Initial Source Approval. No shipments shall be made by any supplier until representative initial production samples have been approved by the appropriate Materials Engineering department(s) as meeting the requirements of this specification.

3.5 Performance Requirements. Performance requirements shall be specified on part drawings or in component specifications. All parts manufactured from these materials shall be resistant to the media contacted, such as aliphatic and aromatic hydrocarbons, fuels, lubricants, oils, greases and alcohols, at the places of use.

3.6 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.

Table 1: Compound Properties (Natural and Black)

Property	Standard	Units	Nominal Glass/Mineral Content
			GF25-M5
International Organization for Standardization (ISO) Symbol	ISO 11469	-	>PBT+PET-(GF25+MD5)<
Density	ISO 1183	g/cm ³	Target Range 1.52 to 1.59
Ash	ISO 3451	% by Mass	30 ± 2
Tensile Modulus	ISO 527-1/2	MPa	7800 to 11 000
Stress at Break	ISO 527-1/2	MPa	≥ 109
Notched Charpy Impact Strength At +23 °C At -30 °C	ISO 179-1/1eA	kJ/m ²	≥ 4 Report Value
Tensile Strength at Break after Heat Aging ^{Note 1}	ISO 527-1/2 ISO 188 1000 h at +140 °C	% Retention	≥ 75