



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

1 Scope

1.1 Material Description. This specification covers the properties of injection moldable, ultraviolet (UV) stable, 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 heating, ventilation, air condition (HVAC) vanes.

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 they become necessary.

2 References

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

2.1 External Standards/Specifications.

ASTM E831	ISO 294-3/4	ISO 3146	ISO 11357-3
ISO 75-2	ISO 527	ISO 3451	ISO 11359-2
ISO 179/1eA	ISO 527-1/2	ISO 7792-2	ISO 11469
ISO 294-1	ISO 1183		

2.2 GM Standards/Specifications.

GMW3013	GMW3221	GMW3417	GMW14444
GMW3059	GMW3232	GMW14162	GMW15634
GMW3205	GMW3235	GMW14334	GMW16853

2.3 Additional References.

TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

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. Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294-1 with the conditions for injection molding from ISO 7792-2. All tests shall be performed on unannealed specimens in a controlled atmosphere per GMW3221, Code A, unless otherwise specified. In addition, tests specified at temperatures below or above 22 °C ± 3 °C shall be conducted at the specified temperature using specimens conditioned at the specified temperature for 4 h minimum.

The minimum values specified in the property tables must be met by test specimens in natural, black or in a standard sampled color if natural or black are not available.

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

3.4 Compound Properties (Natural, Black and Integrally Colored). See Table 1 and Table 2. The following are also required for full standard approval. The minimum number of lots per test required is one in natural:

Poisson's Ratio, Coefficient of Linear Thermal Expansion (CLTE), mold shrinkage, stress strain curve at multiple temperatures (-30 °C, 23 °C, +85 °C). See GMW3013 for the test procedures.

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

Table 1: Compound Properties (Natural and Black)

			Nominal Glass/Mineral Content
Property	Standard	Units	GF25-M5
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	MPa	7800 to 11 000
Stress at Break	ISO 527	MPa	≥109
Notched Charpy Impact Strength At +23 °C At -30 °C	ISO 179/1eA	kJ/m ²	≥4.0 Report value
Tensile Strength at break after 1000 h 140 °C	ISO 527-1/2	% Retention	75
Notched Charpy Impact Strength after 1000 h 140 °C	ISO 179/1eA 1000 h at 140 °C	% Retention	75
Melting Temperature	ISO 3146 or ISO 11357-3	°C	214 to 231
Heat Deflection Temperature under Load 1.82 MPa	ISO 75-2	°C	≥190
Coefficient of Linear Thermal Expansion (for reference only) Parallel to Flow Perpendicular to Flow	ASTM E831 or ISO 11359-2, Thermomechanical Analysis (TMA) mean secant value over the temperature range -30 °C to +160 °C	10 ⁻⁶ mm/mm/°C	Report
Mold Shrinkage (for information only) after 48 h at 23 °C Parallel to Flow Perpendicular to Flow	ISO 294-3/4	%	0.20 to 0.50 0.60 to 0.80
Flammability	GMW3232	mm/minimum	≤100
Emission Testing of Interior Materials: For initial approval, test 1 lot in black.	GMW16853		
- Odor	GMW3205-B3	Rating	≥6
- Fogging	GMW3235-B-Y2-T2	mg	Requirements see GMW16853
- Emissions	GMW15634 VOC value SVOC value	µg/g µg/g	Requirements see GMW16853 Requirements see GMW16853

SVOC = Semi-volatile Organic Compound

VOC = Volatile Organic Compound