



Poly(Phenylene Sulfide) – 65% Glass Fiber Reinforced/Mineral Filled, Flame Retardant

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 standard covers the properties of injection moldable glass fiber reinforced/mineral filled Poly(Phenylene Sulfide) (PPS).

1.2 Symbols. The material abbreviation according to ISO 11469 is >PPS-(GFXX+MDYY)< where XX and YY are percentages of glass fiber reinforcement and mineral filler, respectively.

1.3 Applicability. Electrical Connectors.

1.4 Remarks. The types are differentiated by glass and mineral filler content, e.g., >PPS-(GF40+MD25)<.

2 References

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

2.1 External Standards/Specifications.

ASTM E228	ISO 294-1	ISO 1183-1	ISO 11359-2
ASTM E831	ISO 294-3	ISO 3146	ISO 11469
ISO 75-1/2	ISO 294-4	ISO 3451-1	UL 94
ISO 179-1/1eA	ISO 527-1/2	ISO 11357-3	

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 294-1 with the conditions for injection molding per the resin manufacturer. Test methods and specimen dimensions are also to be in accordance with GMW3013.

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 °C ± 2 °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. See the Plastics Submission Template and GMW3013 for test details and parameters.

3.2 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.

3.3 Compound Properties (Natural and Black). See Table 1. The following are also required for full approval. The minimum number of lots per test required is one unless otherwise specified. See the Plastics Submission Template and GMW3013 for test details and parameters.

- Poisson's Ratio.
- Stress/strain data points and curves at the following temperatures:
- -40 °C, +23 °C, +85 °C, +110 °C, +125 °C, +150 °C, +180 °C, +200 °C, +225 °C.

Note: See GM Material Property Database (GMMPD) tab on Plastics 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 Plastics 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 at the place of use, such as aliphatic and aromatic hydrocarbons, fuels, lubricants, oils, greases and alcohols.

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 Reinforcement/Filler Content			
International Organization for Standardization (ISO) Symbol	ISO 11469	-	>PPS-(GF33+MD33)<	>PPS-(GF35+MD30)<	>PPS-(GF40+MD25)<	>PPS-(GF45+MD20)<
Density	ISO 1183-1	g/cm³	1.8 to 2.1			
Ash	ISO 3451-1	% by mass	62 to 68			
Tensile Modulus	ISO 527-1/2	MPa	18 000 to 24 000			
Tensile Stress at Yield	ISO 527-1/2	MPa	≥ 110	≥ 120	≥ 135	
Strain at Break	ISO 527-1/2	%	≥ 0.5			
Notched Charpy Impact Strength, 23 °C	ISO 179-1/1eA	kJ/m²	≥ 3			
Melting Temperature	ISO 3146 or ISO 11357-3	°C	≥ 275			
Heat Deflection Temperature under Load, 1.8 MPa	ISO 75-1/2	°C	≥ 260			