



Poly(Phenylene Sulfide) – 53% Glass Fiber/Mineral Reinforced

1 Scope

1.1 Material Description. This standard covers the properties of a 53% glass fiber/mineral reinforce injection moldable poly(phenylene sulfide).

1.2 Symbols. The material abbreviation according to ISO 11469 is >PPS-(GF+MD)53<.

1.3 Applicability. Air Pumps.

1.4 Remarks. This specification is divided into two (2) Types based on melt flow:

- **Type 1:** Medium Flow.
- **Type 2:** Easier Flow.

2 References

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

2.1 External Standards/Specifications.

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

2.2 GM Standards/Specifications.

GMW3013	GMW3059	GMW3221
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3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221.

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.

Unless otherwise specified, injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding per the resin manufacturer.

All tests shall be performed on unannealed specimens in a controlled atmosphere of 22 °C ± 3 °C and 50% ± 5% relative humidity (RH) 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.

3.2.1 Compound Properties (Natural and Black). See Table 1 for certifiable requirements. The following are also required for full standard approval.

- The minimum number of lots per test required is one (1) in natural: Poisson's Ratio.
- Coefficient of Linear Thermal Expansion (CLTE) before and after Glass Transition Temperature (Tg).
- Mold Shrinkage.
- Stress/Strain Curve at approximately -30 °C, 23 °C, 85 °C, 125 °C and 150 °C.

See GMW3013 for all test procedures and parameters.

3.2.2 Performance Requirements. Performance requirements shall be specified on part drawings or in component specifications.

Table 1: Compound Properties (Natural and Black)

Property	Standard	Units	Range	
			Type 1	Type 2
Type				
Density	ISO 1183/A	g/cm ³	1.79 to 1.87	
Ash	ISO 3451-1	% by mass	49 to 57	
Tensile Modulus	ISO 527-1/2	MPa	13000 to 18000	
Tensile Stress at Yield	ISO 527-1/2	MPa	≥ 135	≥ 110
Strain at Break	ISO 527-1/2	%	≥ 1.4	≥ 1.4
Notched Charpy Impact Strength At +23 °C	ISO 179/1eA	kJ/m ²	≥ 7	≥ 7
Melting Temperature	ISO 3146 or ISO 11357-3	°C	≥ 270	
Heat Deflection Temperature Under Load 1.8 MPa	ISO 75-1/2	°C	≥ 250	
Molding Shrinkage – Longitudinal – 48 h After Molding	ISO 294-3, ISO 294-4	%	Targeted to 0.3	
Molding Shrinkage - Transverse – 48 h After Molding	ISO 294-3, ISO 294-4	%	Targeted to 0.5	
Coefficient of Linear Thermal Expansion (CLTE) - Parallel	ASTM E228, ASTM E831 or ISO 11359-2	10 ⁻⁶ (mm/mm)/°C	Targeted to 24	
CLTE - Normal	ASTM E228, ASTM E831 or ISO 11359-2	10 ⁻⁶ (mm/mm)/°C	Targeted to 32	