



Poly(Phenylene Sulfide)

1 Scope

1.1 Material Description. This standard covers the properties of injection moldable poly(phenylene sulfide), (PPS).

1.2 Symbols. The material abbreviation according to ISO 11469 is >PPS<.

1.3 Applicability. Electrical Connectors.

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

2.2 GM Standards/Specifications.

GMW3013	GMW3059	GMW3221
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3 Requirements

3.1 Requirements on Test Specimens. Reference GMW3221.

3.1.1 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.

3.1.1.1 Injection molding of test specimens shall be accomplished per ISO 294 with the conditions for injection molding per the resin manufacturer.

3.1.2 All tests shall be performed on unannealed specimens in a controlled atmosphere of $22\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ and $50\% \pm 5\%$ relative humidity (RH) unless otherwise specified. In addition, tests specified at temperatures below or above $22\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$, 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.

3.1.3 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), Mold Shrinkage.
- Stress/Strain Curve at approximately $-30\text{ }^{\circ}\text{C}$, $23\text{ }^{\circ}\text{C}$, $85\text{ }^{\circ}\text{C}$, $125\text{ }^{\circ}\text{C}$ and $150\text{ }^{\circ}\text{C}$.

See GMW3013 for all test procedures and parameters.

3.2 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
Density	ISO 1183/A	g/cm ³	1.31 to 1.37
Tensile Modulus	ISO 527-1/2	MPa	2700 to 4500
Tensile Stress at Yield	ISO 527-1/2	MPa	≥ 58
Strain at Break	ISO 527-1/2	%	≥ 2.1
Notched Charpy Impact Strength At +23 °C	ISO 179/1eA	kJ/m ²	≥ 1
Melting Temperature	ISO 3146 or ISO 11357-3	°C	≥ 260
Heat Deflection Temperature under Load 1.8 MPa	ISO 75-1/2	°C	≥ 95
Flame Retardant	UL 94		V-0
Molding shrinkage – longitudinal – 48 h after molding	ISO 294-3, ISO 294-4	%	Targeted to 1.3
Coefficient of Linear Thermal Expansion (CLTE) - Parallel	ASTM E228, ASTM E831 or ISO 11359-2	10 ⁻⁶ mm/mm°C	Targeted to 40

4 Manufacturing Process

Not applicable.

5 Rules and Regulations

5.1 Legal Regulations. All materials must satisfy applicable laws, rules, regulations and recommendations valid in the country of usage.

5.2 Language. In the event of conflict between the English and domestic language, the English language shall take precedence.

5.3 Inspection and Rejection. Samples of components or materials released to a GM material specification shall be tested for conformity with the requirements of this material specification and approved by the responsible Engineering department prior to commencement of delivery of bulk supplies.

A new approval must be received for any changes, e.g., properties, manufacturing process, location of manufacture, etc. If not otherwise agreed, all testing and documentation normally required for initial release must be completed.

It is the responsibility of the supplier to inform the customer in a timely manner, without solicitation, and to include documentation of all modifications of materials and/or processes and to apply for a new release.

5.4 Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS). For new product submissions, or when a change in chemical composition of an existing product has occurred, a complete copy of the Material Safety Data Sheet/Safety Data Sheet must be submitted in compliance with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS) requirements or other country-specific MSDS/SDS requirements.