

Polyphenylene sulfide

Fortron 4184L4 is the strongest and toughest glass/mineral reinforced product available. It offers excellent heat resistance at high loads and good chemical resistance. The electrical properties are excellent and the product is inherently flame-retardant. This product also offers low creep resistance and good rigidity due to the mineral content. Applications made of this grade include electronic components (i.e. bobbins, connectors and solenoid valves).

Product information

Resin Identification	PPS-(GF+MD)5		ISO 1043
Part Marking Code	3 >PPS-(GF+MD)5		ISO 11469
Rheological properties			
Moulding shrinkage, parallel	0.3	%	ISO 294-4, 2577
Moulding shrinkage, normal	0.6	%	ISO 294-4, 2577
Typical mechanical properties			
Tensile modulus	16600	MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	160	MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	1.4	%	ISO 527-1/-2
Flexural modulus	16200	MPa	ISO 178
Flexural strength	250	MPa	ISO 178
Compressive modulus	16200		ISO 604
Compressive strength		MPa	ISO 604
Compressive stress at 1% strain		MPa	ISO 604
Charpy impact strength, 23°C		kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C		kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C		kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C		kJ/m² kJ/m²	ISO 179/1eA ISO 180/1A
Izod notched impact strength, 23°C Izod notched impact strength, -30°C		kJ/m ²	ISO 180/1A ISO 180/1A
Izod impact strength, 23°C		kJ/m ²	ISO 180/14 ISO 180/1U
Izod impact strength, -30°C		kJ/m ²	ISO 180/10
Hardness, Rockwell, M-scale	100		ISO 2039-2
Poisson's ratio	0.33 ^[C]		100 2003 2
[C]: Calculated	0.00		
Thermal properties			
Melting temperature, 10°C/min	280	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min		°C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	270		ISO 75-1/-2
Temperature of deflection under load, 8 MPa	215		ISO 75-1/-2
Coefficient of linear thermal expansion		E-6/K	ISO 11359-1/-2
(CLTE), parallel			
Coefficient of linear thermal expansion (CLTE), normal	32	E-6/K	ISO 11359-1/-2
Specific heat capacity of melt	1600	J/(kg K)	ISO 22007-4



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Flammability			
Burning Behav. at 1.5mm nom. thickn.	V-0	class	IEC 60695-11-10
Thickness tested		mm	IEC 60695-11-10
Burning Behav. at thickness h		class	IEC 60695-11-10
Thickness tested	0.75	mm	IEC 60695-11-10
Electrical properties			
Relative permittivity, 1MHz	4.7		IEC 62631-2-1
Dissipation factor, 1MHz		E-4	IEC 62631-2-1
Volume resistivity		Ohm.m	IEC 62631-3-1
Surface resistivity	>1E15	Ohm kV/mm	IEC 62631-3-2 IEC 60243-1
Electric strength Comparative tracking index	150	κν/!!!!!!	IEC 60243-1
Arc Resistance	156	s	UL 746B
	100	0	
Physical/Other properties			
Water absorption, 2mm	0.02		Sim. to ISO 62
Water absorption, Immersion 24h	0.03		Sim. to ISO 62
Density	1800	kg/m³	ISO 1183
Injection			
Drying Recommended	yes		
Drying Temperature	130		
Drying Time, Dehumidified Dryer	2 - 4		
Processing Moisture Content	≤0.02		
Melt Temperature Optimum	330 310		
Min. melt temperature Max. melt temperature	340		
Screw tangential speed	0.2 - 0.3		
Mold Temperature Optimum	150		
Min. mould temperature	140	°C	
Max. mould temperature	160	°C	
Hold pressure range	30 - 70		
Back pressure		MPa	
Ejection temperature	217	°C	

Characteristics

Additives

Release agent

Additional information

Injection molding

Preprocessing

Predrying in a dehumidified air dryer at 130 - 140 degC/3-4 hours is recommended.

Processing

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On injection molding machines with 15-25 D long three-section screws, as are usual in the trade, the FORTRON is processable. A shut-off nozzle is preferred to a free-flow nozzle.

Melt temperature 320-340 degC Mold wall temperature at least 140 degC

A medium injection rate is normally preferred. All mold cavities must be effectively vented.

Postprocessing

Tool temperature of at least 135 degC is recommended for parts to achieve maximum crystallizable potential.

Processing Notes

Pre-Drying

FORTRON should in principle be predried. Because of the necessary low maximum residual moisture content the use of dry air dryers is recommended. The dew point should be $=< -30^{\circ}$ C. The time between drying and processing should be as short as possible.

Storage

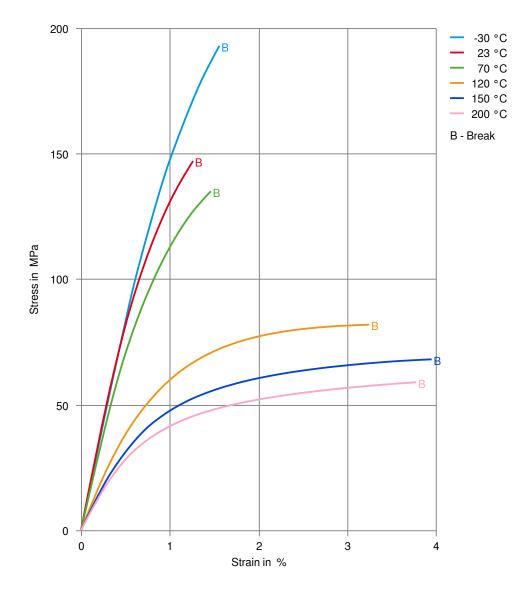
For subsequent storage the material should be stored dry in the dryer until processed (<= 60 h).

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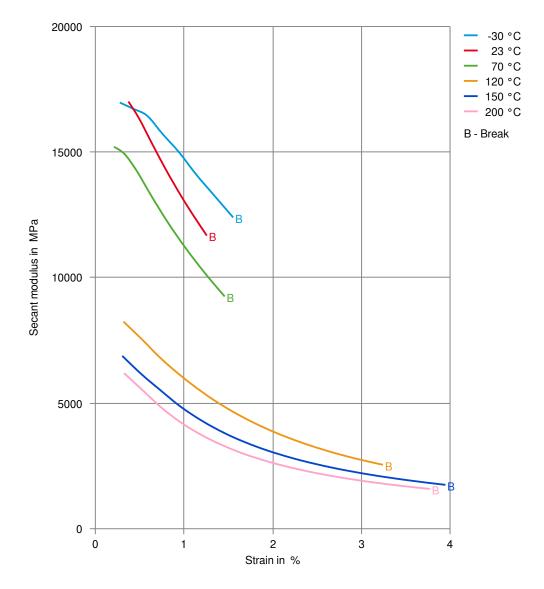
Stress-strain





Polyphenylene sulfide

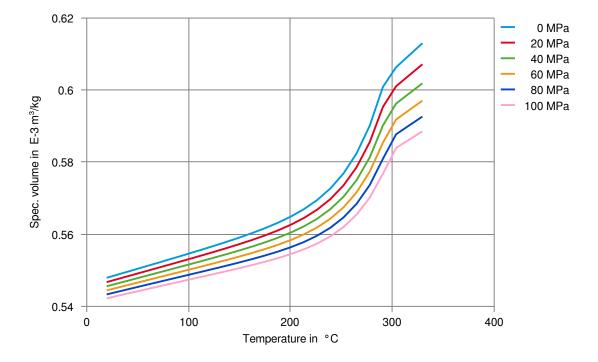
Secant modulus-strain





Polyphenylene sulfide

Specific volume-temperature (pvT)



Printed: 2024-09-05

Page: 6 of 6

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