

FORTRON® 4184L4 - PPS

Description

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).

Physical properties	Value	Unit	Test Standard
Density	1800	kg/m ³	ISO 1183
Molding shrinkage, parallel	0.3	%	ISO 294-4, 2577
Molding shrinkage, normal	0.6	%	ISO 294-4, 2577
Water absorption, 23°C-sat	0.02	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	16600	MPa	ISO 527-2/1A
Tensile stress at break, 5mm/min	165	MPa	ISO 527-2/1A
Tensile strain at break, 5mm/min	1.4	%	ISO 527-2/1A
Flexural modulus, 23°C	16200	MPa	ISO 178
Flexural stress at break	250	MPa	ISO 178
Charpy impact strength, 23°C	29	kJ/m ²	ISO 179/1eU
Charpy impact strength, -30°C	29	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	7	kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	7	kJ/m ²	ISO 179/1eA
Izod impact notched, 23°C	7	kJ/m ²	ISO 180/1A
Izod impact notched, -30°C	7	kJ/m ²	ISO 180/1A
Izod impact unnotched, 23°C	27	kJ/m ²	ISO 180/1U
Izod impact unnotched, -30°C	27	kJ/m ²	ISO 180/1U
Compressive modulus	16200	MPa	ISO 604
Rockwell hardness (M-Scale)	100	M-Scale	ISO 2039-2

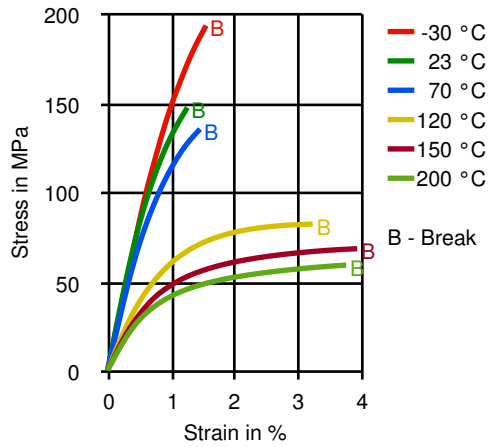
Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	280	°C	ISO 11357-1/-3
Glass transition temperature, 10°C/min	90	°C	ISO 11357-1,-2,-3
DTUL at 1.8 MPa	270	°C	ISO 75-1, -2
DTUL at 8.0 MPa	215	°C	ISO 75-1, -2
Coeff. of linear therm expansion, parallel	0.24	E-4/°C	ISO 11359-2
Coeff. of linear therm expansion, normal	0.32	E-4/°C	ISO 11359-2
Flammability @1.6mm nom. thickn.	V-0	class	UL 94
thickness tested (1.6)	1.5	mm	UL 94
Flammability at thickness h	V-0	class	UL 94
thickness tested (h)	0.75	mm	UL 94

Electrical properties	Value	Unit	Test Standard
Relative permittivity, 1MHz	4.7	-	IEC 60250
Dissipation factor, 1MHz	20	E-4	IEC 60250
Volume resistivity	>1E13	Ohm*m	IEC 60093
Surface resistivity	>1E15	Ohm	IEC 60093
Electric strength	27	kV/mm	IEC 60243-1

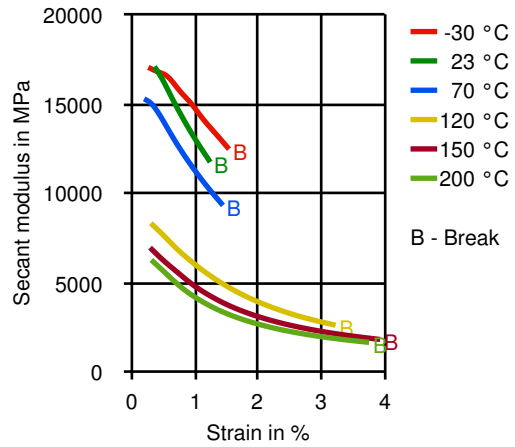
Rheological calculation properties	Value	Unit	Test Standard
Spec. heat capacity melt	1600	J/(kg K)	Internal

Diagrams

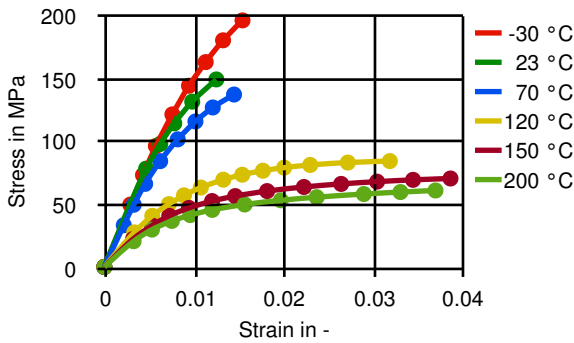
Stress-strain



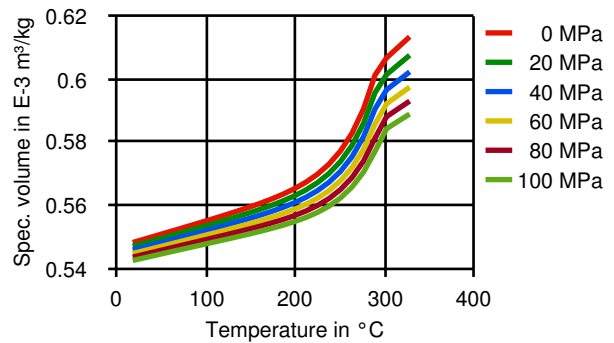
Secant modulus-strain



True Stress-strain



Moldflow Specific volume-temperature (pvT)



Typical injection moulding processing conditions

	Value	Unit	Test Standard
Pre Drying			
Necessary low maximum residual moisture content	0.02	%	-
Drying time	3 - 4	h	-
Drying temperature	130 - 140	°C	-
Temperature			
Hopper temperature	20 - 30	°C	-
Feeding zone temperature	60 - 80	°C	-
Zone1 temperature	290 - 300	°C	-
Zone2 temperature	310 - 320	°C	-
Zone3 temperature	330 - 340	°C	-
Zone4 temperature	330 - 340	°C	-
Nozzle temperature	310 - 330	°C	-
Melt temperature	330	°C	-
Mold temperature	140 - 160	°C	-
Hot runner temperature	330 - 340	°C	-
Pressure			
Back pressure max.	30	bar	-
Speed			
Injection speed	fast	-	-
Screw Speed			
Screw speed diameter, 25mm	120	RPM	-
Screw speed diameter, 40mm	75	RPM	-
Screw speed diameter, 55mm	50	RPM	-

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Other	Value	Unit	Test Standard
Specimen thickness (shrinkage)	3.18	mm	Internal

Other text information

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 $\leq -30^{\circ}\text{C}$. The time between drying and processing should be as short as possible.

Longer pre-drying times/storage

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

Injection molding

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.

Characteristics

Special Characteristics

Flame retardant, Light stabilized, Platable

Delivery Form

Pellets

Product Categories

Mineral/Glass reinforced

Additives

Release agent

Processing

Injection molding

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General Disclaimer

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