Celanese
The chemistry inside innovation™

FORTRON® ICE 504L - PPS

Description

40% Glass-filled, improved crystallization
FORTRON ICE 504L is a 40% glass fiber reinforced polyphenylene sulfide, that belongs to our new generation of Fortron® PPS.
This new technology allows optimization of molding conditions with faster cycle times. Due to the faster crystallization of the material at a higher temperature, the option of mold wall temperature reduction can be subject of advanced process optimization. The potential for optimization of Fortron® ICE by cycle time reduction is possible by standard cavity surface temperatures of 140°C. The potential for lowering the mold temperature must be checked individually and it depends on process and part design.

Physical properties	Value	Unit	Test Standard
Density	**103**	lb/ft^3	ISO 1183
Molding shrinkage, parallel (flow)	**0.3**	%	ISO 294-4, 2577
Molding shrinkage, transverse normal	**0.6**	%	ISO 294-4, 2577
Water absorption, 23°C-sat	**0.02**	%	Sim. to ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus	**2.19E6**	psi	ISO 527-1, -2
Tensile stress at break, 5mm/min	**29300**	psi	ISO 527-1, -2
Tensile strain at break, 5mm/min	**1.9**	%	ISO 527-1, -2
Flexural modulus, 23°C	**2.18E6**	psi	ISO 178
Flexural stress at break	**42600**	psi	ISO 178
Charpy impact strength, 23°C	**25.2**	ft-lb/in^2	ISO 179/1eU
Charpy impact strength, -30°C	**25.2**	ft-lb/in^2	ISO 179/1eU
Charpy notched impact strength, 23°C	**4.76**	ft-lb/in^2	ISO 179/1eA
Charpy notched impact strength, -30°C	**4.76**	ft-lb/in^2	ISO 179/1eA
Izod impact notched, 23°C	**4.76**	ft-lb/in^2	ISO 180/1A
Izod impact notched, -30°C	**4.76**	ft-lb/in^2	ISO 180/1A
Izod impact unnotched, 23°C	**16.2**	ft-lb/in^2	ISO 180/1U
Izod impact unnotched, -30°C	**16.2**	ft-lb/in^2	ISO 180/1U
Compressive modulus	**2.18E6**	psi	ISO 604
Rockwell hardness (M-Scale)	**100**	M-Scale	ISO 2039-2

Thermal properties	Value	Unit	Test Standard
Melting temperature, 10°C/min	**536**	°F	ISO 11357-1/-3
Glass transition temperature, 10°C/min	**194**	°F	ISO 11357-1,-2,-3
DTUL at 1.8 MPa	**518**	°F	ISO 75-1, -2
DTUL at 8.0 MPa	**419**	°F	ISO 75-1, -2
Coeff. of linear therm expansion, parallel	**0.144**	E-4/°F	ISO 11359-2
Coeff. of linear therm expansion, normal	**0.233**	E-4/°F	ISO 11359-2
Limiting oxygen index (LOI)	**47**	%	ISO 4589-1/-2
Flammability @1.6mm nom. thickn.	**V-0**	class	UL 94
thickness tested (1.6)	**0.1**	in	UL 94
Flammability at thickness h	**V-0**	class	UL 94
thickness tested (h)	**0.0150**	in	UL 94
Glow wire ignition temperature, 1.0 mm	**1520**	°F	IEC 60695-2-13
Glow wire ignition temperature, 2.0 mm	**1520**	°F	IEC 60695-2-13
Glow wire flammability index, 1.0 mm	**1760**	°F	IEC 60695-2-12
Glow wire flammability index, 2.0 mm	**1760**	°F	IEC 60695-2-12

Electrical properties	Value	Unit	Test Standard
Dielectric constant (Dk), 1MHz	**4.1**	-	IEC 60250
Dissipation factor, 1MHz	**20**	E-4	IEC 60250
Volume resistivity, 23°C	**>2E14**	Ohm*m	IEC 62631-3-1
Volume resistivity at high temperature	**1E10**	Ohm*m	IEC 62631-3-1
Temperature	**428**	°F	-
Surface resistivity, 23°C	**>1E15**	Ohm	IEC 62631-3-2

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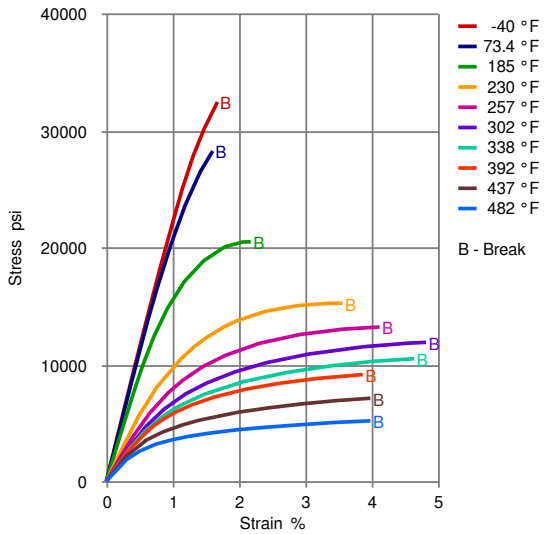
Surface resistivity at high temperature	**1E10**	Ohm	IEC 62631-3-2
Temperature	**428**	°F	-
Electric strength, 23 °C (DC)	**1020**	kV/in	IEC 60243-2
Electric strength at high temperature (DC)	**686**	kV/in	IEC 60243-2
Temperature	**428**	°F	-
Comparative tracking index	**PLC 4**	-	UL 746

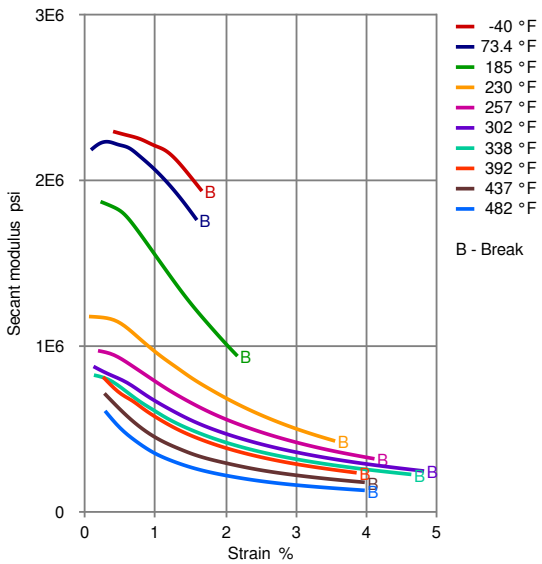
Rheological calculation properties	Value	Unit	Test Standard
Spec. heat capacity melt	**1500**	J/(kg K)	Internal

Diagrams

Stress-strain



Secant modulus-strain



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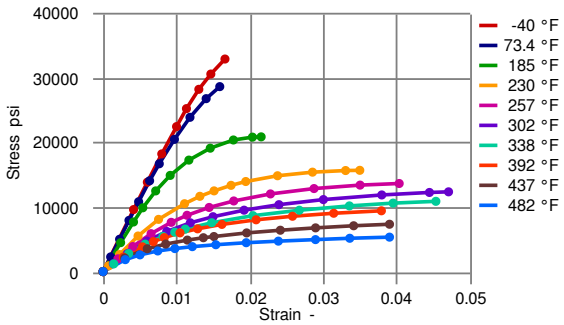
True Stress-strain



no yield at all temperatures
Poisson's value used is 0.40

Typical injection moulding processing conditions

Pre Drying	Value	Unit
Necessary low maximum residual moisture content	**0.02**	%
Drying time	**3 - 4**	h
Drying temperature	**266 - 284**	°F

Temperature	Value	Unit
Hopper temperature	**68 - 86**	°F
Feeding zone temperature	**140 - 176**	°F
Zone1 temperature	**554 - 572**	°F
Zone2 temperature	**590 - 608**	°F
Zone3 temperature	**626 - 644**	°F
Zone4 temperature	**626 - 644**	°F
Nozzle temperature	**590 - 626**	°F
Melt temperature	**626 - 644**	°F
Mold temperature	**284 - 320**	°F
Hot runner temperature	**626 - 644**	°F

Pressure	Value	Unit
Back pressure max.	**30**	bar

Speed	Value
Injection speed	**fast**

Screw Speed	Value	Unit
Screw speed diameter, 25mm	**120**	RPM
Screw speed diameter, 40mm	**75**	RPM
Screw speed diameter, 55mm	**50**	RPM

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 =< - 30 ° 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).

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Characteristics

Special Characteristics	Auto spec approved, Flame retardant, Heat resistant, High crystallinity
Product Categories	Glass reinforced, Specialty
Processing	Injection molding
Regulatory	Drinking water approved
Delivery Form	Pellets
Additives	Release agent

Other Approvals

OEM	Specification	Additional Information
Stellantis - Chrysler	CPN 3502	Black
GM	GMW17521P-PPS-GF40-Type 2	Black & Natural
Hyundai	MS244-02, Type A-2	
Renault	IP03a	
VW Group	VW50137	