FORTRON® 1140L4 - PPS

Description

Fortron 1140L4 is a 40% glass-reinforced grade that is the strongest and toughest product available. It exhibits excellent heat and chemical resistance, good electrical properties and is inherently flame-retardant. The high hardness and rigidity at elevated temperatures allows for good load bearing performance. This product has good weldability due to the modest filler level. Applications made of this grade are electronical components (i.e. bobbins, lamp housings, brush holders) and various other components requiring strength and resistance to aggressive chemicals (i.e. automotive heaters, pumps, valves, fuel rails, microwave oven rings and distillation column packings).

Physical properties	Value	Unit	Test Standard
Density	**1650**	kg/m³	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	**14700**	MPa	ISO 527-2/1A
Tensile stress at break, 5mm/min	**195**	MPa	ISO 527-2/1A
Tensile strain at break, 5mm/min	**1.9**	%	ISO 527-2/1A
Flexural modulus, 23°C	**14500**	MPa	ISO 178
Flexural stress at break	**285**	MPa	ISO 178
Charpy impact strength, 23°C	**53**	kJ/m²	ISO 179/1eU
Charpy impact strength, -30°C	**53**	kJ/m²	ISO 179/1eU
Charpy notched impact strength, 23°C	**10**	kJ/m²	ISO 179/1eA
Charpy notched impact strength, -30°C	**10**	kJ/m²	ISO 179/1eA
Izod impact notched, 23°C	**10**	kJ/m²	ISO 180/1A
Izod impact notched, -30°C	**10**	kJ/m²	ISO 180/1A
Izod impact unnotched, 23°C	**34**	kJ/m²	ISO 180/1U
Izod impact unnotched, -30°C	**34**	kJ/m²	ISO 180/1U
Compressive modulus	**15000**	MPa	ISO 604
Rockwell hardness	**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	**0.26**	E-4/°C	ISO 11359-2
Coeff. of linear therm expansion, normal	**0.42**	E-4/°C	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)	**1.5**	mm	UL 94
Flammability at thickness h	**V-0**	class	UL 94
thickness tested (h)	**0.38**	mm	UL 94
Flammability 5V at thickness h	**5VA**	class	UL 94
thickness tested (5V)	**3.0**	mm	UL 94

Electrical properties	Value	Unit	Test Standard
Relative permittivity, 1MHz	**4.1**	-	IEC 60250
Dissipation factor, 1MHz	**20**	E-4	IEC 60250
Volume resistivity	**>1E13**	Ohm*m	IEC 60093
Surface resistivity	**6.6E11**	Ohm	IEC 60093
Electric strength	**28**	kV/mm	IEC 60243-1
Comparative tracking index	**125**	-	IEC 60112

Test specimen production	Value	Unit	Test Standard
Injection Molding, melt temperature	**310 - 340**	°C	ISO 294
Injection Molding, mold temperature	**135 - 160**	°C	ISO 294

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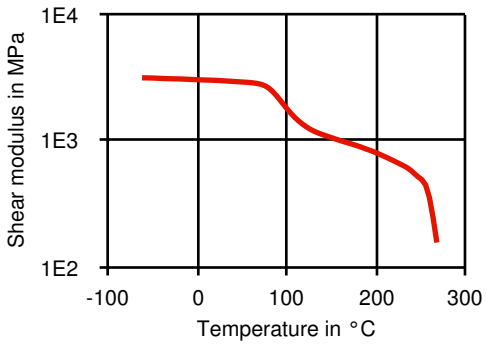
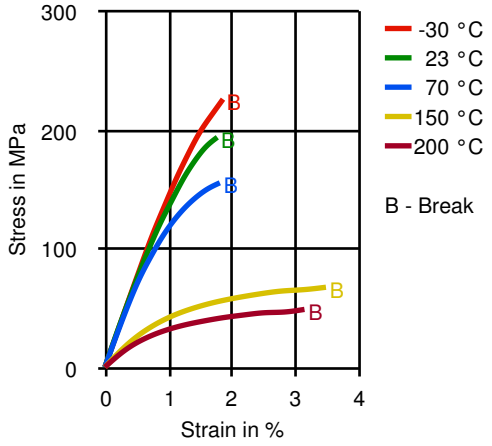
Rheological calculation properties	Value	Unit	Test Standard
Spec. heat capacity melt	**1500**	J/(kg K)	Internal

Diagrams

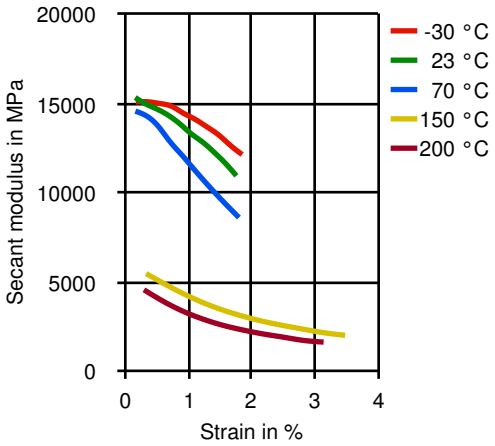
Dynamic Shear modulus-temperature



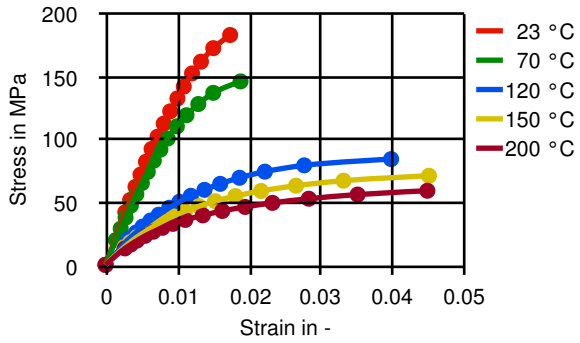
Stress-strain



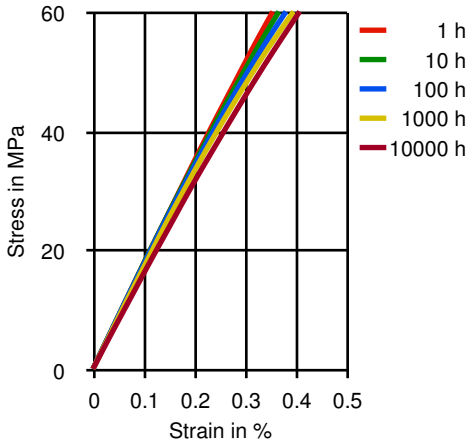
Secant modulus-strain



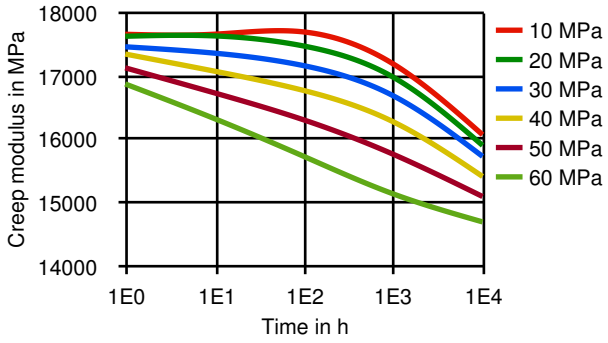
True Stress-strain



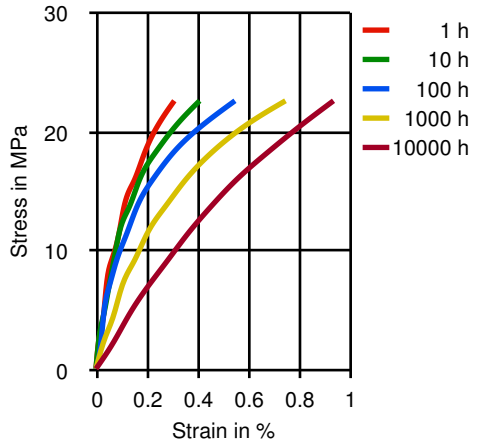
Stress-strain (isochronous) 23 °C



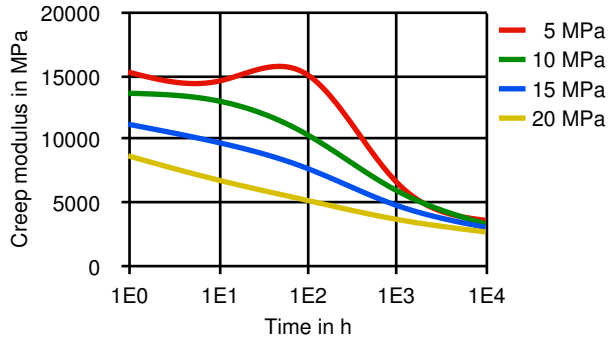
Creep modulus-time 23 °C



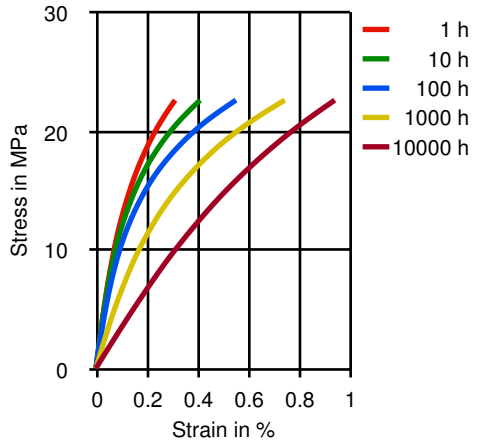
Stress-strain (isochronous) 120 °C



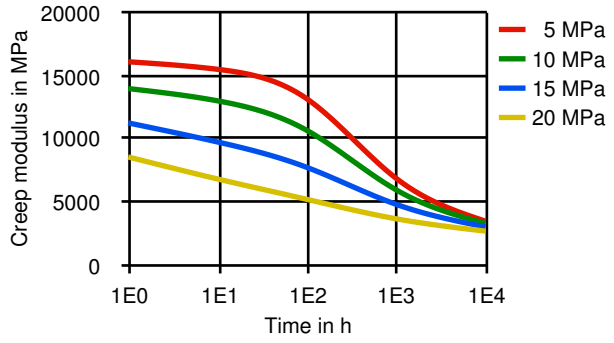
Creep modulus-time 120 °C



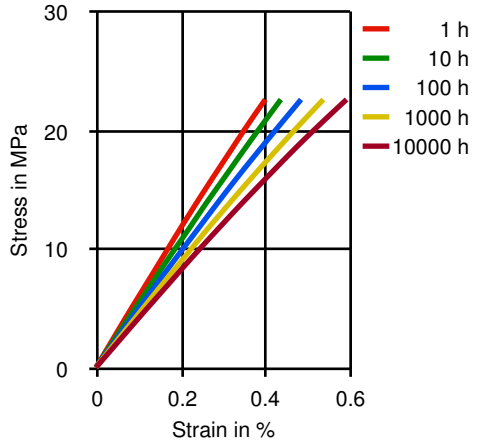
Stress-strain (isochronous) 150 °C



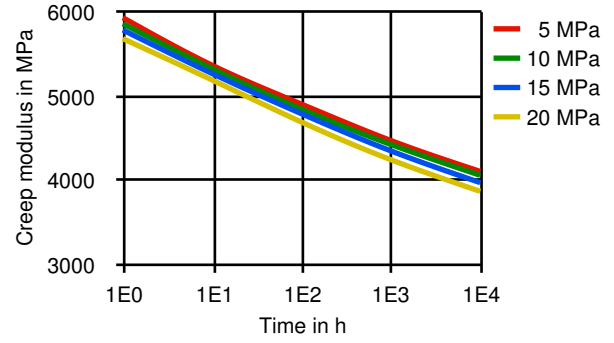
Creep modulus-time 150 °C



Stress-strain (isochronous) 200 °C



Creep modulus-time 200 °C



Typical injection moulding processing conditions

Pre Drying	Value	Unit	Test Standard
Necessary low maximum residual moisture content	**0.02**	%	-
Drying time	**3 - 4**	h	-
Drying temperature	**130 - 140**	°C	-

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Temperature	Value	Unit	Test Standard
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	-
Die temperature	**310 - 330**	°C	-
Melt temperature	**330 - 340**	°C	-
Cavity temperature	**140 - 160**	°C	-
Hot runner temperature	**330 - 340**	°C	-
Pressure	**Value**	**Unit**	**Test Standard**
Back pressure max.	**30**	bar	-
Speed	**Value**	**Unit**	**Test Standard**
Injection speed	**fast**	-	-
Screw Speed	**Value**	**Unit**	**Test Standard**
Screw speed diameter, 25mm	**120**	RPM	-
Screw speed diameter, 40mm	**75**	RPM	-
Screw speed diameter, 55mm	**50**	RPM	-
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 =< - 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).

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

Product Categories	Delivery Form
Glass reinforced	Pellets
Processing	**Additives**
Injection molding	Release agent

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General Disclaimer

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