

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 electrical 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/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	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/m ²	ISO 179/1eU
Charpy impact strength, -30°C	53	kJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	10	kJ/m ²	ISO 179/1eA
Charpy notched impact strength, -30°C	10	kJ/m ²	ISO 179/1eA
Izod impact notched, 23°C	10	kJ/m ²	ISO 180/1A
Izod impact notched, -30°C	10	kJ/m ²	ISO 180/1A
Izod impact unnotched, 23°C	34	kJ/m ²	ISO 180/1U
Izod impact unnotched, -30°C	34	kJ/m ²	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. thickness tested (1.6)	V-0 1,5	class mm	UL 94 UL 94
Flammability at thickness h thickness tested (h)	V-0 0,38	class mm	UL 94 UL 94
Flammability 5V at thickness h thickness tested (5V)	5VA 3,0	class mm	UL 94 UL 94

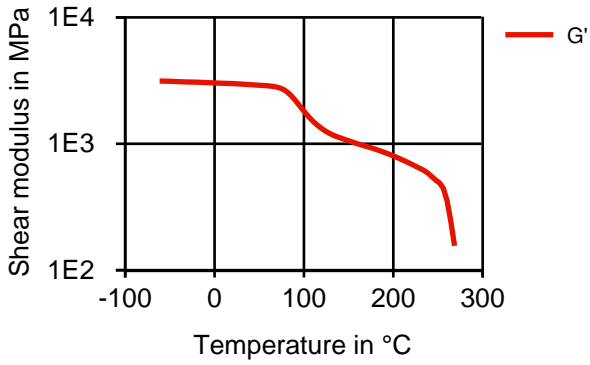
Electrical properties	Value	Unit	Test Standard
Relative permittivity, 1MHz	4,1	-	IEC 60250
Dissipation factor, 1MHz	20	E-4	IEC 60250
Volume resistivity	>1E13	Ohm*m	IEC 60093
Surface resistivity	6,6E11	Ohm	IEC 60093
Electric strength	28	kV/mm	IEC 60243-1
Comparative tracking index	125	-	IEC 60112

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

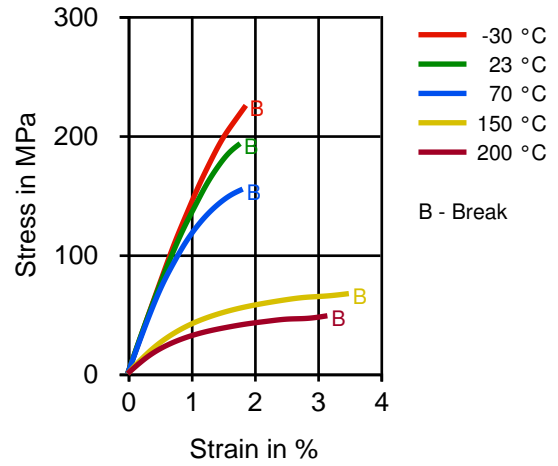
Rheological calculation properties	Value	Unit	Test Standard
Spec. heat capacity melt	1500	J/(kg K)	Internal

Diagrams

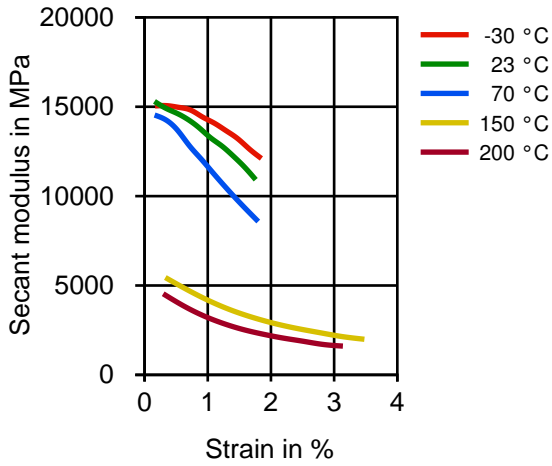
Dynamic Shear modulus-temperature



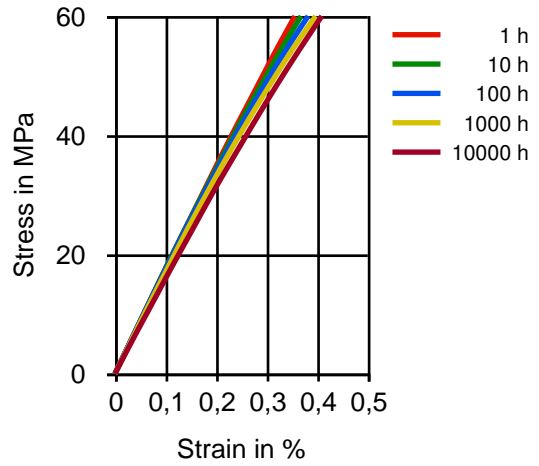
Stress-strain



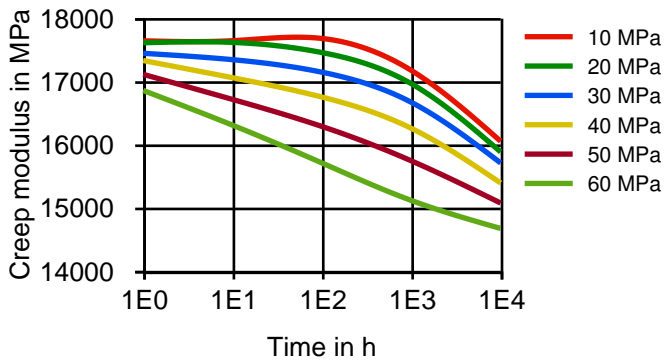
Secant modulus-strain



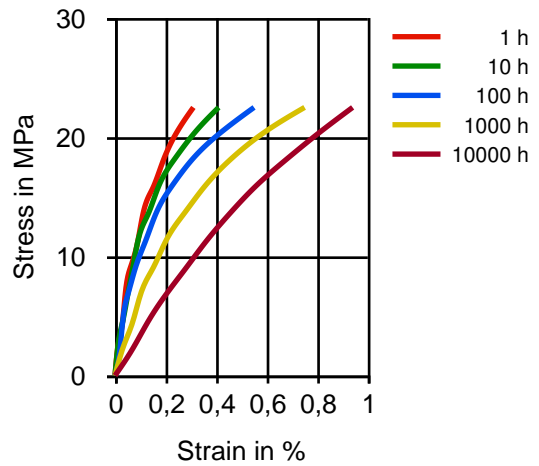
Stress-strain (isochronous) 23 °C



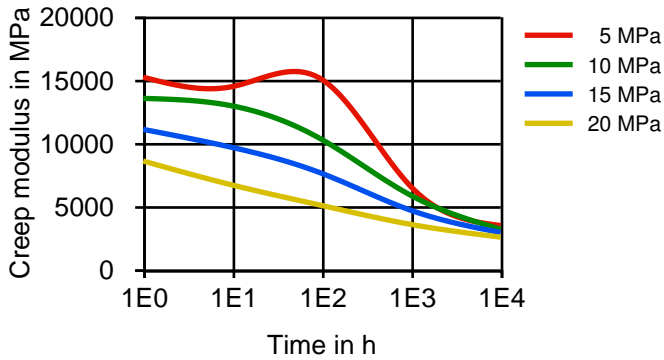
Creep modulus-time 23 °C



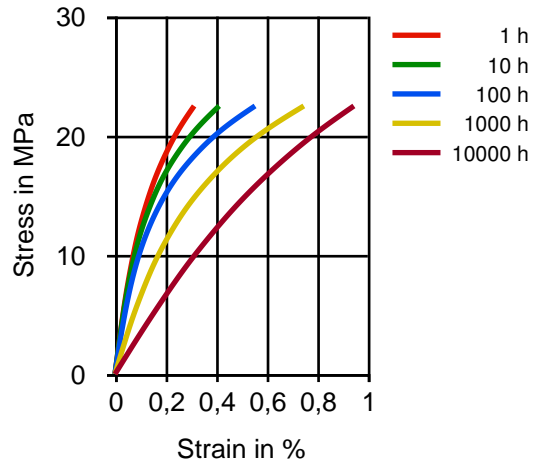
Stress-strain (isochronous) 120 °C



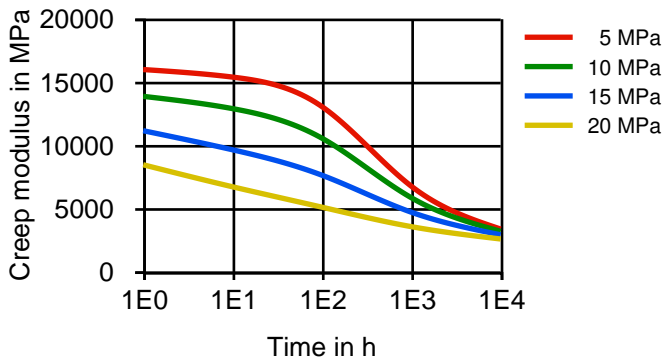
Creep modulus-time 120 °C



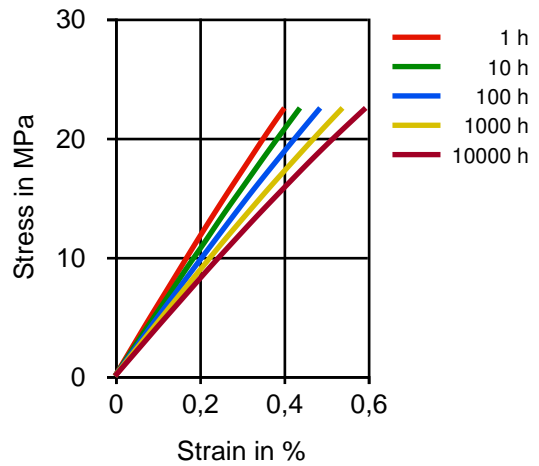
Stress-strain (isochronous) 150 °C



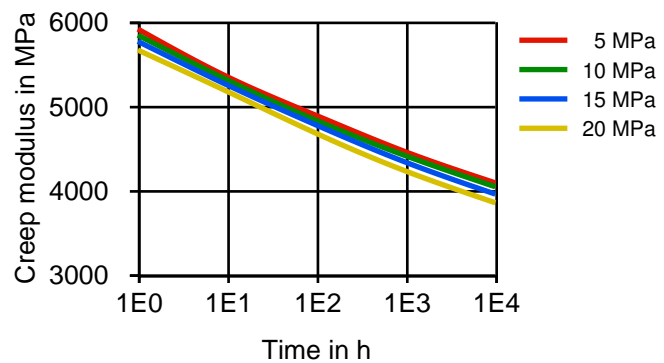
Creep modulus-time 150 °C



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	-
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	-

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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 $\leq -30^{\circ}\text{C}$. 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

Product Categories

Glass reinforced

Contact Information

Americas

8040 Dixie Highway
Florence, KY 41042 USA
Product Information Service
t: +1-800-833-4882
t: +1-859-372-3244
Customer Service
t: +1-800-526-4960
t: +1-859-372-3214
e: info-engineeredmaterials-am@celanese.com

Asia

4560 Jinke Road
Zhang Jiang Hi Tech Park
Shanghai 201203 PRC
Customer Service
t: +86 21 3861 9266
f: +86 21 3861 9599
e: info-engineeredmaterials-
asia@celanese.com

Europe

Am Unisys-Park 1
65843 Sulzbach, Germany
Product Information Service
t: +49-800-86427-531
t: +49-(0)-69-45009-1011
e: info-engineeredmaterials-eu@celanese.com

General Disclaimer

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