
FORTRON® 4184L4 | PPS | Mineral / Glass Reinforced

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
Mold shrinkage - parallel	0.3 - 0.6	%	ISO 294-4
Mold shrinkage - normal	0.4 - 0.7	%	ISO 294-4
Water absorption (23°C-sat)	0.02	%	ISO 62

Mechanical properties	Value	Unit	Test Standard
Tensile modulus (1mm/min)	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 @ 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
Unnotched impact str (Izod) @ 23°C	27	kJ/m ²	ISO 180/1U
Notched impact strength (Izod) @ 23°C	7	kJ/m ²	ISO 180/1A
Notched impact strength (Izod) @ -30°C	7	kJ/m ²	ISO 180/1A
Rockwell hardness	100	M-Scale	ISO 2039-2

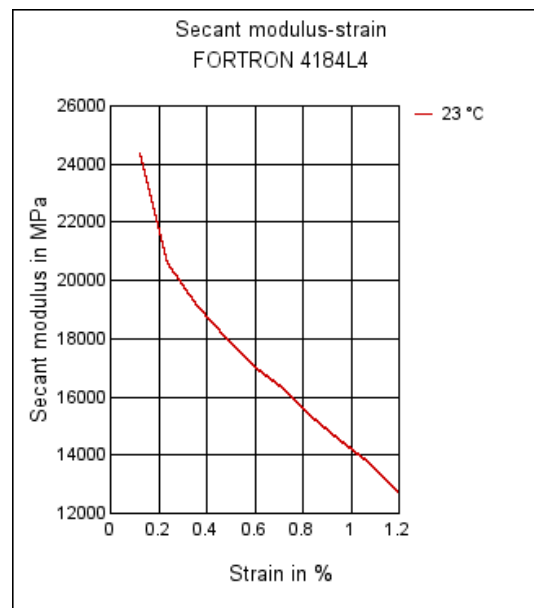
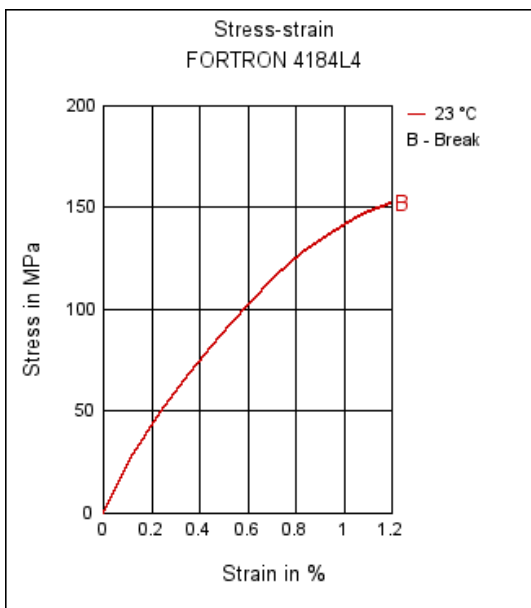
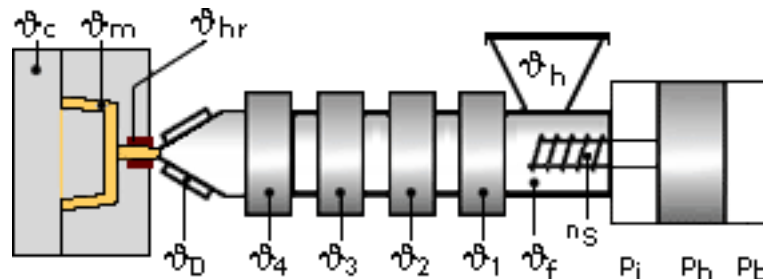
Thermal properties	Value	Unit	Test Standard
Melting temperature (10°C/min)	280	°C	ISO 11357-1,-2,-3
Glass transition temperature (10°C/min)	90	°C	ISO 11357-1,-2,-3
DTUL @ 1.8 MPa	270	°C	ISO 75-1/-2
DTUL @ 8.0 MPa	215	°C	ISO 75-1/-2
Coeff.of linear therm. expansion (parallel)	0.24	E-4/°C	ISO 11359-2
Coeff.of linear therm. expansion (normal)	0.32	E-4/°C	ISO 11359-2
Flammability @1.6mm nom. thickn. thickness tested (1.6)	V-0 1.5	class mm	UL94 UL94
Flammability at thickness h thickness tested (h)	V-0 0.75	class mm	UL94 UL94

Electrical properties	Value	Unit	Test Standard
Relative permittivity - 1 MHz	4.7	-	IEC 60250
Dissipation factor - 1 MHz	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
Comparative tracking index CTI	150	-	IEC 60112

FORTRON® 4184L4 | PPS | Mineral / Glass Reinforced

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
Specific heat capacity of melt	1600	J/(kg K)	Internal

Stress-strain
Secant modulus-strain

Typical injection moulding processing conditions

Pre Drying:
Necessary low maximum residual moisture content: 0.02%

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.

FORTRON® 4184L4 | PPS | Mineral / Glass Reinforced

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

Drying time: 3 - 4 h

Drying temperature: 130 - 140 °C

Temperature:

	ϑ _{Manifold}	ϑ _{Mold}	ϑ _{Melt}	ϑ _{Nozzle}	ϑ _{Zone4}	ϑ _{Zone3}	ϑ _{Zone2}	ϑ _{Zone1}	ϑ _{Feed}	ϑ _{Hopper}
min (°C)	330	140	330	310	330	330	310	290	60	20
max (°C)	340	160	340	330	340	340	320	300	80	30

Pressure:

	Inj press	Hold press	Back pressure
min (bar)	500	300	0
max (bar)	1000	700	30

Speed:

Injection speed: fast

Screw speed

Screw diameter (mm)	16	25	40	55	75
Screw speed (RPM)	-	120	75	50	-

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.

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

Europa

Am Unisys-Park 1, 65843 Sulzbach, Germany
 Product Information Service
 t: +(00)-800-86427-531 t: +49-(0)-69-45009-1011
 e: info-engineeredmaterials-eu@celanese.co

FORTRON® 4184L4 | PPS | Mineral / Glass Reinforced

General Disclaimer

This publication was printed based on Celanese's present state of knowledge, and Celanese undertakes no obligation to update it. Because conditions of product use are outside Celanese's control, Celanese makes no warranties, express or implied, and assumes no liability in connection with any use of this information. Nothing herein is intended as a license to operate under or a recommendation to infringe any patents.

NOTICE TO USERS: Values shown are based on testing of laboratory test specimens and represent data that fall within the standard range of properties for natural material. These values alone do not represent a sufficient basis for any part design and are not intended for use in establishing maximum, minimum, or ranges of values for specification purposes. Colorants or other additives may cause significant variations in data values.

Properties of molded parts can be influenced by a wide variety of factors including, but not limited to, material selection, additives, part design, processing conditions and environmental exposure. Any determination of the suitability of a particular material and part design for any use contemplated by the users and the manner of such use is the sole responsibility of the users, who must assure themselves that the material as subsequently processed meets the needs of their particular product or use.

To the best of our knowledge, the information contained in this publication is accurate; however, we do not assume any liability whatsoever for the accuracy and completeness of such information. The information contained in this publication should not be construed as a promise or guarantee of specific properties of our products. It is the sole responsibility of the users to investigate whether any existing patents are infringed by the use of the materials mentioned in this publication.

Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. We recommend that persons intending to rely on any recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy themselves that they can meet all applicable safety and health standards.

We strongly recommend that users seek and adhere to the manufacturer's current instructions for handling each material they use, and entrust the handling of such material to adequately trained personnel only. Please call the telephone numbers listed (+49 (0) 69 30516299 for Europe, +1 859-372-3244 for the Americas and +86 21 3861 9266 for Asia) for additional technical information. Visit our web site for the appropriate Safety Data Sheets (SDS) before attempting to process our products. Feel free to call Customer Services for additional assistance.

The products mentioned herein are not intended for use in medical or dental implants.

© 2014 Celanese or its affiliates. All rights reserved. (Published 25.November.2014)

Celanese®, registered C-ball design and all other trademarks identified herein with ®, TM, SM, unless otherwise noted, are trademarks of Celanese or its affiliates. Fortron is a registered trademark of Fortron Industries LLC.