

# FORTRON® ICE 504L HR

## Polyphenylene sulfide

FORTRON ICE 504L HR is a 40% glass fiber reinforced polyphenylene sulfide, that belongs to our new generation of Fortron® PPS.

This new technology combines improved hydrolysis resistance with 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.

### Product information

Resin Identification	PPS-GF40	ISO 1043
Part Marking Code	>PPS-GF40<	ISO 11469

### Rheological properties

Moulding shrinkage, parallel	0.3 %	ISO 294-4, 2577
Moulding shrinkage, normal	0.6 %	ISO 294-4, 2577

### Typical mechanical properties

Tensile modulus	16000 MPa	ISO 527-1/-2
Tensile stress at break, 5mm/min	200 MPa	ISO 527-1/-2
Tensile strain at break, 5mm/min	1.8 %	ISO 527-1/-2
Flexural modulus	15000 MPa	ISO 178
Flexural strength	290 MPa	ISO 178
Charpy notched impact strength, 23 °C	9 kJ/m <sup>2</sup>	ISO 179/1eA
Izod notched impact strength, 23 °C	8.5 kJ/m <sup>2</sup>	ISO 180/1A
Izod impact strength, 23 °C	58.7 kJ/m <sup>2</sup>	ISO 180/1U
Poisson's ratio	0.33 <sup>[C]</sup>	

[C]: Calculated

### Thermal properties

Melting temperature, 10 °C/min	280 °C	ISO 11357-1/-3
Glass transition temperature, 10 °C/min	90 °C	ISO 11357-1/-3
Temperature of deflection under load, 1.8 MPa	270 °C	ISO 75-1/-2
Thermal conductivity, flow	0.47 W/(m K)	ISO 22007-2
Thermal conductivity, crossflow	0.41 W/(m K)	ISO 22007-2
Thermal conductivity, through plane	0.39 W/(m K)	ISO 22007-2
Effective thermal diffusivity, flow	2.7E-7 m <sup>2</sup> /s	ISO 22007-4
Effective thermal diffusivity, crossflow	2.4E-7 m <sup>2</sup> /s	ISO 22007-4
Effective thermal diffusivity, through plane	2.2E-7 m <sup>2</sup> /s	ISO 22007-4
Specific heat capacity of melt	1040 J/(kg K)	ISO 22007-4

### Flammability

Burning Behav. at thickness h	V-0 class	IEC 60695-11-10
Thickness tested	0.38 mm	IEC 60695-11-10
Oxygen index	47 %	ISO 4589-1/-2

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## Electrical properties

Volume resistivity	1E15 Ohm.m	IEC 62631-3-1
Arc Resistance	134 s	UL 746B

## Physical/Other properties

Water absorption, 2mm	0.02 %	Sim. to ISO 62
Water absorption, Immersion 24h	0.02 %	Sim. to ISO 62
Density	1600 kg/m <sup>3</sup>	ISO 1183

## Injection

Drying Recommended	yes
Drying Temperature	130 °C
Drying Time, Dehumidified Dryer	2 - 4 h
Processing Moisture Content	≤0.02 %
Melt Temperature Optimum	330 °C
Min. melt temperature	310 °C
Max. melt temperature	340 °C
Screw tangential speed	0.2 - 0.3 m/s
Mold Temperature Optimum	150 °C
Min. mould temperature	140 °C
Max. mould temperature	160 °C
Hold pressure range	30 - 70 MPa
Back pressure	3 MPa

## Characteristics

Additives	Release agent
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## Additional information

Injection molding

### Preprocessing

Predrying in a dehumidified air dryer at 130 - 140 degC/3-4 hours is recommended.

### Processing

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.

### Postprocessing

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Tool temperature of at least 135 degC is recommended for parts to achieve maximum crystallizable potential.

### Processing Notes

#### 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.

#### Storage

For subsequent storage the material should be stored dry in the dryer until processed ( $\leq 60\text{ h}$ ).