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Kalix® 5950 HFFR

high performance polyamide

Kalix® 5950 HFFR is a halogen-free, flame retardant (UL-94 V0 at 0.4 mm), highly reinforced polyamide material specifically formulated for high strength and stiffness applications where good impact resistance and excellent dimensional stability after molding are required. The formulation also addresses warpage issues associated with the anisotropic shrinkage of glass fiber reinforced materials so that close tolerance molding is more easily achieved. Its low viscosity and excellent flow properties make the material ideal for filling parts with thin-walled sections such as those encountered in the mobile electronics industry.

- Black: Kalix® 5950 BK 000 HFFR
- White: Kalix® 5950 WH 000 HFFR
- White: Kalix® 5950 WH 001 HFFR
- White: Kalix® 5950 WH 008 HFFR

General

Material Status	• Commercial: Active	
Availability	• Africa & Middle East • Asia Pacific • Europe	• Latin America • North America
Filler / Reinforcement	• Glass Fiber, 50% Filler by Weight	
Features	• Flame Retardant • Good Dimensional Stability • Good Impact Resistance • Good Surface Finish • Halogen Free • High Flow	• High Stiffness • High Strength • Low Moisture Absorption • Low Warpage • Paintable • Platable
Uses	• Cell Phones • Electrical Parts	• Electrical/Electronic Applications • Thin-walled Parts
RoHS Compliance	• RoHS Compliant	
Appearance	• Black	• White
Forms	• Pellets	
Processing Method	• Injection Molding	

Physical	Typical Value	Unit	Test method
Density	1.68	g/cm³	ISO 1183
Molding Shrinkage [1]			Internal Method
Across Flow	0.18	%	
Flow	0.060	%	
Water Absorption (24 hr, 23°C)	0.11	%	ASTM D570

Mechanical	Typical Value	Unit	Test method
Tensile Modulus	20000	MPa	ISO 527-2
Tensile Modulus - 50% RH, equilibrium	19700	MPa	ISO 527-2
Tensile Stress (Yield)	245	MPa	ISO 527-2
Tensile Strength - 50% RH, equilibrium	183	MPa	ISO 527-2
Tensile Strain (Break)	1.8	%	ISO 527-2
Tensile Strain at Break - 50% RH, equilibriuim	1.7	%	ISO 527-2
Flexural Modulus	19000	MPa	ISO 178
Flexural Stress	350	MPa	ISO 178

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Mechanical	Typical Value	Unit	Test method
Flexural Strain at Break	2.2	%	ISO 178

Impact	Typical Value	Unit	Test method
Notched Izod Impact Strength	15	kJ/m²	ISO 180/1A
Unnotched Izod Impact Strength	50	kJ/m²	ISO 180

Thermal	Typical Value	Unit	Test method
Heat Deflection Temperature			
0.45 MPa, Unannealed	255	°C	ISO 75-2/B
1.8 MPa, Unannealed	247	°C	ISO 75-2/A
Glass Transition Temperature	90.0	°C	ASTM D3418

Electrical	Typical Value	Unit	Test method
Dielectric Constant [2] (2.40 GHz)	4.48		ASTM D2520
Dissipation Factor [2] (2.40 GHz)	0.011		ASTM D2520

Flammability	Typical Value	Unit	Test method
Flame Rating			UL 94
0.40 mm, All colors	V-0		
1.5 mm, All colors	5VA		

Additional Information

Typical values shown tested on Dry as Molded samples.

Standard Packaging and Labeling:

- Kalix® HFFR resin is packaged in foil lined, multiwall paper bags containing 25 kg (55 pounds) of material. Individual packages will be plainly marked with the product number, the color, the lot number, and the net weight.

Injection	Typical Value	Unit
Drying Temperature	80 to 100	°C
Drying Time	4.0 to 12	hr
Suggested Max Moisture	0.070	%
Rear Temperature	270	°C
Front Temperature	285	°C
Processing (Melt) Temp	275 to 285	°C
Mold Temperature	115 to 130	°C

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Injection Notes

Storage:

- Kalix® compounds are shipped in moisture-resistant packages at moisture levels according to specifications. Sealed, undamaged bags should be preferably stored in a dry room at a maximum temperature of 50°C (122°F) and should be protected from possible damage. If only a portion of a package is used, the remaining material should be transferred into a sealable container. It is recommended that Kalix® resins be dried prior to molding following the recommendations found in this datasheet and/or in the Kalix® processing guide.

Drying:

- Kalix® HFFR is supplied in sealed bags. It should be dried before molding because excessive moisture content will result in reduced mechanical properties and processing issues, such as excessive nozzle drooling, foaming and splay visible on the molded parts.

- Drying temperatures of up to 100°C may be used for dark colored resin (such as black) to achieve shorter drying times, if necessary. For lighter colored resin, 80°C drying temperature is recommended to minimize the risk of oxidative discoloring.

- Use of a desiccant dryer with -40°C dewpoint is strongly suggested to ensure Kalix® material has reached optimum moisture content before processing.

Injection Molding:

- Kalix® HFFR can be readily injection molded in most screw injection molding machines. A general purpose screw is recommended, with minimum back pressure. The melt temperature should be in the range 280°-285°C (535°F-545°F). Generally this can be achieved with barrel temperatures from 250°C (482°F) in the rear zone, gradually increasing to 280°C-290°C (535°F-554°F) in the front zone. Mold temperature heater set points should be in the range of 115°C-130°C (239°F-266°F) with surface finish improving as the temperature is increased.

- Set injection pressure to give rapid injection. Adjust holding pressure to one-half injection pressure. Set hold time to maximize part weight. Transfer from injection to hold pressure at the screw position just before the part is completely filled.

Notes

Typical properties: these are not to be construed as specifications.

[1] Solvay Test Method. Shrink rates can vary with part design and processing conditions. Please consult a Solvay Technical Representative for more information.

[2] Method B

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