

# KetaSpire® KT-820 SP

## polyetheretherketone

KetaSpire® KT-820 SP is a low flow/high viscosity grade of unreinforced natural polyetheretherketone (PEEK) that is designed for extrusion based applications. The SP suffix denotes small pellets (2.25 mm diameter on average), which contribute to improved feeding and conveying in small extruders and other processing equipment. KetaSpire® PEEK is produced to the highest industry standards and is characterized by a distinct combination of properties, which include excellent chemical resistance, best-in-class fatigue resistance, ease of melt processing, high purity, and a host of other attributes.

These properties make it well-suited for applications in healthcare, transportation, electronics, chemical processing, and other industrial uses. In addition to extrusion, KetaSpire® KT-820 SP can also be processed using injection molding processes. This material comes in pellet form with a 0.02% dusting of a vegetable derived calcium stearate on the pellets. The calcium stearate dusting is to further aid in pellet conveyance in extruders and injection molding machines.

### General

Material Status	• Limited Distribution	
Availability	• Africa & Middle East • Asia Pacific • Europe	• Latin America • North America
Additive	• Lubricant	
Features	• Autoclave Sterilizable • Chemical Resistant • Ductile • E-beam Sterilizable • Ethylene Oxide Sterilizable • Fatigue Resistant • Flame Retardant • Good Dimensional Stability • Good Impact Resistance	• Good Sterilizability • Heat Sterilizable • High Heat Resistance • Radiation (Gamma) Resistant • Radiation Sterilizable • Radiotranslucent • Steam Resistant • Steam Sterilizable
Uses	• Aircraft Applications • Automotive Applications • Connectors • Dental Applications • Electrical/Electronic Applications • Film • Gears • Hospital Goods • Housings	• Industrial Applications • Medical Devices • Medical/Healthcare Applications • Oil/Gas Applications • Pump Parts • Seals • Surgical Instruments • Tubing
Agency Ratings	• AAMA 303	• USP Class VI
RoHS Compliance	• RoHS Compliant	
Appearance	• Black	• Natural Color
Forms	• Pellets <sup>1</sup>	

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Processing Method	<ul style="list-style-type: none"> <li>Extrusion Blow Molding</li> <li>Film Extrusion</li> <li>Injection Molding</li> </ul>	<ul style="list-style-type: none"> <li>Machining</li> <li>Profile Extrusion</li> <li>Wire &amp; Cable Extrusion</li> </ul>
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Physical	Typical Value	Unit	Test method
Density / Specific Gravity	1.30		ASTM D792
Melt Mass-Flow Rate (MFR) (400°C/2.16 kg)	3.0	g/10 min	ASTM D1238
Molding Shrinkage <sup>2</sup>			ASTM D955
Flow	1.1 to 1.3	%	
Across Flow	1.3 to 1.5	%	
Water Absorption (24 hr)	0.10	%	ASTM D570

Mechanical	Typical Value	Unit	Test method
Tensile Modulus			
-- <sup>3</sup>	3500	MPa	ASTM D638
--	3830	MPa	ISO 527-1/1A/1
Tensile Stress			
Yield	96.0	MPa	ISO 527-2/1A/50
-- <sup>3</sup>	95.0	MPa	ASTM D638
Tensile Elongation			
Yield <sup>3</sup>	5.2	%	ASTM D638
Yield	4.9	%	ISO 527-2/1A/50
Break <sup>4</sup>	78	%	ASTM D638
Flexural Modulus	3700	MPa	ASTM D790 ISO 178
Flexural Strength			
--	146	MPa	ASTM D790
--	121	MPa	ISO 178
Compressive Strength	118	MPa	ASTM D695
Shear Strength	84.1	MPa	ASTM D732
Poisson's Ratio	0.33		ASTM E132

Impact	Typical Value	Unit	Test method
Notched Izod Impact			
--	91	J/m	ASTM D256
--	9.2	kJ/m <sup>2</sup>	ISO 180
Unnotched Izod Impact			
--	No Break		ASTM D4812
--		kJ/m <sup>2</sup>	ISO 180

Hardness	Typical Value	Unit	Test method
Rockwell Hardness (M-Scale)	97		ASTM D785
Durometer Hardness (Shore D, 1 sec)	88		ASTM D2240

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Thermal	Typical Value	Unit	Test method
Deflection Temperature Under Load <sup>5</sup> 1.8 MPa, Annealed, 3.20 mm	157	°C	ASTM D648
Glass Transition Temperature	150	°C	ASTM D3418
Peak Melting Temperature	340	°C	ASTM D3418
CLTE - Flow (-50 to 50°C)	4.3E-5	cm/cm/°C	ASTM E831
Specific Heat			DSC
50°C	1560	J/kg/°C	
200°C	2150	J/kg/°C	
Thermal Conductivity	0.24	W/m/K	ASTM E1530

Electrical	Typical Value	Unit	Test method
Surface Resistivity	> 1.9E+17	ohms	ASTM D257
Volume Resistivity	1.6E+17	ohms-cm	ASTM D257
Dielectric Strength (2.50 mm)	17	kV/mm	ASTM D149
Dielectric Constant			ASTM D150
60 Hz	3.06		
1 kHz	3.10		
1 MHz	3.05		
Dissipation Factor			ASTM D150
60 Hz	1.0E-3		
1 kHz	1.0E-3		
1 MHz	3.0E-3		

Flammability	Typical Value	Unit	Test method
Flame Rating			UL 94
0.8 mm	V-1		
1.6 mm	V-0		
Oxygen Index	37	%	ASTM D2863

Fill Analysis	Typical Value	Unit	Test method
Melt Viscosity (400°C, 1000 sec <sup>-1</sup> )	440	Pa·s	ASTM D3835

### Additional Information

#### Standard Packaging and Labeling

- KetaSpire® PEEK resins are packaged in polyethylene buckets or cardboard boxes depending upon the order size. Individual packages will be plainly marked with the product, color, lot number, and net weight.

Injection	Typical Value	Unit
Drying Temperature	150	°C
Drying Time	4.0	hr
Rear Temperature	355	°C
Middle Temperature	365	°C
Front Temperature	370	°C
Nozzle Temperature	375	°C
Mold Temperature	175 to 205	°C

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Injection	Typical Value	Unit
Injection Rate	Fast	
Screw Compression Ratio	2.5:1.0 to 3.5:1.0	

## Injection Notes

### Drying

- KetaSpire® PEEK resins must be dried completely prior to melt processing. Incomplete drying will result in defects in the formed part ranging from surface streaks to severe bubbling. Pellets can be dried on trays in a circulating air oven or in desiccating hopper dryer. Drying conditions recommended are 4 hours at 150°C (300°F) .

### Injection Molding

- KetaSpire® PEEK resins can be readily injection molded in most screw injection machines. A general purpose screw with a compression ratio in the range of 2.5 – 3.5 : 1 is recommended, as is minimum back pressure. Injection speeds should be as fast as possible, consistent with part appearance requirements. Mold temperatures in the range of 175°C to 205°C (350°F to 400°F) are suggested. Recommended starting point barrel temperatures are shown in the following table.

## Notes

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

<sup>1</sup> Pellets are supplied lightly dusted with the lubricant calcium stearate (0.02% level). For non-lubricated, natural color grade order KT-820 NL SP.

<sup>2</sup> 0.125"x0.5"x5" bar

<sup>3</sup> 50 mm/min

<sup>4</sup> 5.0 mm/min

<sup>5</sup> 2 hours at 200°C

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