

# AvaSpire® AV-651

## polyaryletherketone

AvaSpire® AV-651 is an unreinforced polyaryletherketone (PAEK) that offers more ductility and impact strength than PEEK, with higher chemical and environmental stress cracking resistance than AvaSpire® AV-650. It has been specifically formulated for applications requiring a balance of chemical resistance and mechanical strength along with good part aesthetics, bridging the performance gaps within the ultra polymers space.

These properties make it well-suited for applications in healthcare, transportation, electronics, chemical processing and other industrial uses.

AvaSpire® AV-651 can be easily processed by typical injection molding and extrusion methods using conventional processing equipment.

- Natural: AvaSpire® AV-651 NT
- Beige: AvaSpire® AV-651 BG 15
- Black: AvaSpire® AV-651 BK 95

### General

Material Status	<ul style="list-style-type: none"> <li>• Commercial: Active</li> </ul>	
Availability	<ul style="list-style-type: none"> <li>• Africa &amp; Middle East</li> <li>• Asia Pacific</li> <li>• Europe</li> </ul>	<ul style="list-style-type: none"> <li>• Latin America</li> <li>• North America</li> </ul>
Features	<ul style="list-style-type: none"> <li>• Autoclave Sterilizable</li> <li>• Biocompatible</li> <li>• Chemical Resistant</li> <li>• Ductile</li> <li>• E-beam Sterilizable</li> <li>• Ethylene Oxide Sterilizable</li> <li>• Fatigue Resistant</li> <li>• Flame Retardant</li> <li>• Good Dimensional Stability</li> </ul>	<ul style="list-style-type: none"> <li>• Good Impact Resistance</li> <li>• Good Sterilizability</li> <li>• Heat Sterilizable</li> <li>• High Heat Resistance</li> <li>• Radiation (Gamma) Resistant</li> <li>• Radiation Sterilizable</li> <li>• Radiotranslucent</li> <li>• Steam Resistant</li> <li>• Steam Sterilizable</li> </ul>
Uses	<ul style="list-style-type: none"> <li>• Aerospace Applications</li> <li>• Aircraft Applications</li> <li>• Bearings</li> <li>• Dental Applications</li> <li>• Film</li> <li>• Hospital Goods</li> <li>• Industrial Applications</li> </ul>	<ul style="list-style-type: none"> <li>• Medical Devices</li> <li>• Medical/Healthcare Applications</li> <li>• Oil/Gas Applications</li> <li>• Pump Parts</li> <li>• Seals</li> <li>• Surgical Instruments</li> </ul>
Agency Ratings	<ul style="list-style-type: none"> <li>• FAA FAR 25.853a<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• ISO 10993</li> </ul>
RoHS Compliance	<ul style="list-style-type: none"> <li>• RoHS Compliant</li> </ul>	
Appearance	<ul style="list-style-type: none"> <li>• Beige</li> <li>• Black</li> </ul>	<ul style="list-style-type: none"> <li>• Natural Color</li> </ul>
Forms	<ul style="list-style-type: none"> <li>• Pellets</li> </ul>	
Processing Method	<ul style="list-style-type: none"> <li>• Extrusion Blow Molding</li> <li>• Fiber (Spinning) Extrusion</li> <li>• Film Extrusion</li> <li>• Injection Blow Molding</li> <li>• Injection Molding</li> </ul>	<ul style="list-style-type: none"> <li>• Machining</li> <li>• Profile Extrusion</li> <li>• Thermoforming</li> <li>• Wire &amp; Cable Extrusion</li> </ul>

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Physical	Typical Value	Unit	Test method
Density / Specific Gravity	1.29		ASTM D792
Melt Mass-Flow Rate (MFR) (400°C/2.16 kg)	25	g/10 min	ASTM D1238
Molding Shrinkage <sup>2</sup>			ASTM D955
Flow : 3.18 mm	0.70 to 0.90	%	
Across Flow : 3.18 mm	1.0 to 1.2	%	
Water Absorption (24 hr)	0.20	%	ASTM D570
Mechanical	Typical Value	Unit	Test method
Tensile Modulus			
-- <sup>3</sup>	3000	MPa	ASTM D638
--	3200	MPa	ISO 527-2/1A/1
Tensile Stress			
Yield	89.0	MPa	ISO 527-2/1A/50
-- <sup>3</sup>	87.0	MPa	ASTM D638
Tensile Elongation			
Yield <sup>3</sup>	6.2	%	ASTM D638
Yield	5.7	%	ISO 527-2/1A/50
Break <sup>3</sup>	> 40	%	ASTM D638
Break	> 40	%	ISO 527-2/1A/50
Flexural Modulus			
--	3100	MPa	ASTM D790
--	3200	MPa	ISO 178
Flexural Strength			
--	124	MPa	ASTM D790
--	127	MPa	ISO 178
Compressive Strength	112	MPa	ASTM D695
Shear Strength	78.0	MPa	ASTM D732
Impact	Typical Value	Unit	Test method
Notched Izod Impact			
--	69	J/m	ASTM D256
--	6.6	kJ/m <sup>2</sup>	ISO 180
Unnotched Izod Impact	No Break		ASTM D256 ISO 180
Hardness	Typical Value	Unit	Test method
Rockwell Hardness (M-Scale)	94		ASTM D785
Thermal	Typical Value	Unit	Test method
Deflection Temperature Under Load <sup>4</sup>			ASTM D648
1.8 MPa, Annealed, 3.20 mm	190	°C	
Glass Transition Temperature	158	°C	ASTM D3418
Peak Melting Temperature	345	°C	ASTM D3418
CLTE - Flow (-50 to 50°C)	4.7E-5	cm/cm/°C	ASTM E831
Specific Heat			DSC
50°C	1310	J/kg/°C	
200°C	1820	J/kg/°C	
Thermal Conductivity	0.24	W/m/K	ASTM E1530

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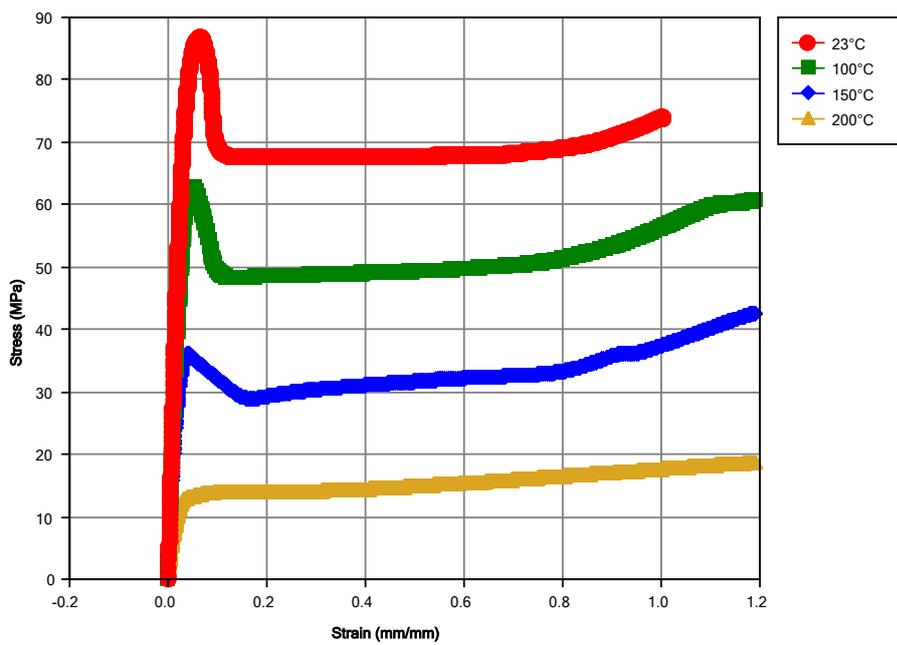
Electrical	Typical Value	Unit	Test method
Surface Resistivity	> 1.9E+17	ohms	ASTM D257
Volume Resistivity	5.0E+17	ohms·cm	ASTM D257
Dielectric Strength (3.00 mm)	16	kV/mm	ASTM D149
Dielectric Constant			ASTM D150
60 Hz	3.10		
1 kHz	3.12		
1 MHz	3.10		
Dissipation Factor			ASTM D150
60 Hz	1.0E-3		
1 kHz	1.0E-3		
1 MHz	4.0E-3		
Flammability	Typical Value	Unit	Test method
Flame Rating			UL 94
0.8 mm	V-0		
1.6 mm	V-0		
Fill Analysis	Typical Value	Unit	Test method
Melt Viscosity (400°C, 1000 sec <sup>-1</sup> )	240	Pa·s	ASTM D3835

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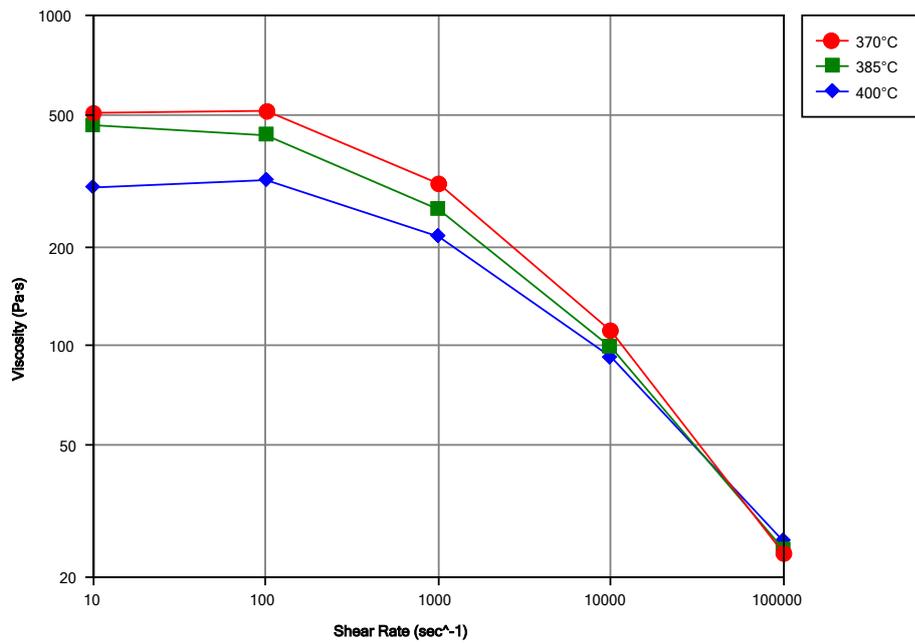
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Injection	Typical Value	Unit
Drying Temperature	150	°C
Drying Time	4.0	hr
Rear Temperature	355	°C
Middle Temperature	365	°C
Front Temperature	370	°C
Nozzle Temperature	375	°C
Processing (Melt) Temp	365 to 390	°C
Mold Temperature	150 to 180	°C
Injection Rate	Fast	
Screw Compression Ratio	2.0:1.0 to 3.0:1.0	

Isothermal Stress vs. Strain (ISO 11403-1)



Viscosity vs. Shear Rate (ISO 11403-2)



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## Notes

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

<sup>1</sup> Passes 60s VB flame, smoke & toxicity.

<sup>2</sup> 5" x 0.5" x 0.125"

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

<sup>4</sup> 2 hours at 200°C

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