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	• Commercial: Active	
Availability	• Africa & Middle East • Asia Pacific • Europe	• Latin America • North America
Features	• Autoclave Sterilizable • Biocompatible • 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	• Aerospace Applications • Aircraft Applications • Bearings • Dental Applications • Film • Hospital Goods • Industrial Applications	• Medical Devices • Medical/Healthcare Applications • Oil/Gas Applications • Pump Parts • Seals • Surgical Instruments
Agency Ratings	• FAA FAR 25.853a [1]	• ISO 10993
RoHS Compliance	• RoHS Compliant	
Appearance	• Beige • Black	• Natural Color
Forms	• Pellets	

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General

Processing Method	• Extrusion Blow Molding • Fiber (Spinning) Extrusion • Film Extrusion • Injection Blow Molding • Injection Molding	• Machining • Profile Extrusion • Thermoforming • Wire & Cable Extrusion

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 [2]			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			
-- [3]	3000	MPa	ASTM D638
--	3200	MPa	ISO 527-1/1A/1
Tensile Stress			
Yield	89.0	MPa	ISO 527-2/1A/50
-- [3]	87.0	MPa	ASTM D638
Tensile Elongation			
Yield [3]	6.2	%	ASTM D638
Yield	5.7	%	ISO 527-2/1A/50
Break [3]	> 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/m²	ISO 180
Unnotched Izod Impact	No Break		ASTM D4812 ISO 180

Hardness	Typical Value	Unit	Test method
Rockwell Hardness (M-Scale)	94		ASTM D785

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Thermal	Typical Value	Unit	Test method
Deflection Temperature Under Load [4]			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

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^-1)	240	Pa·s	ASTM D3835

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	

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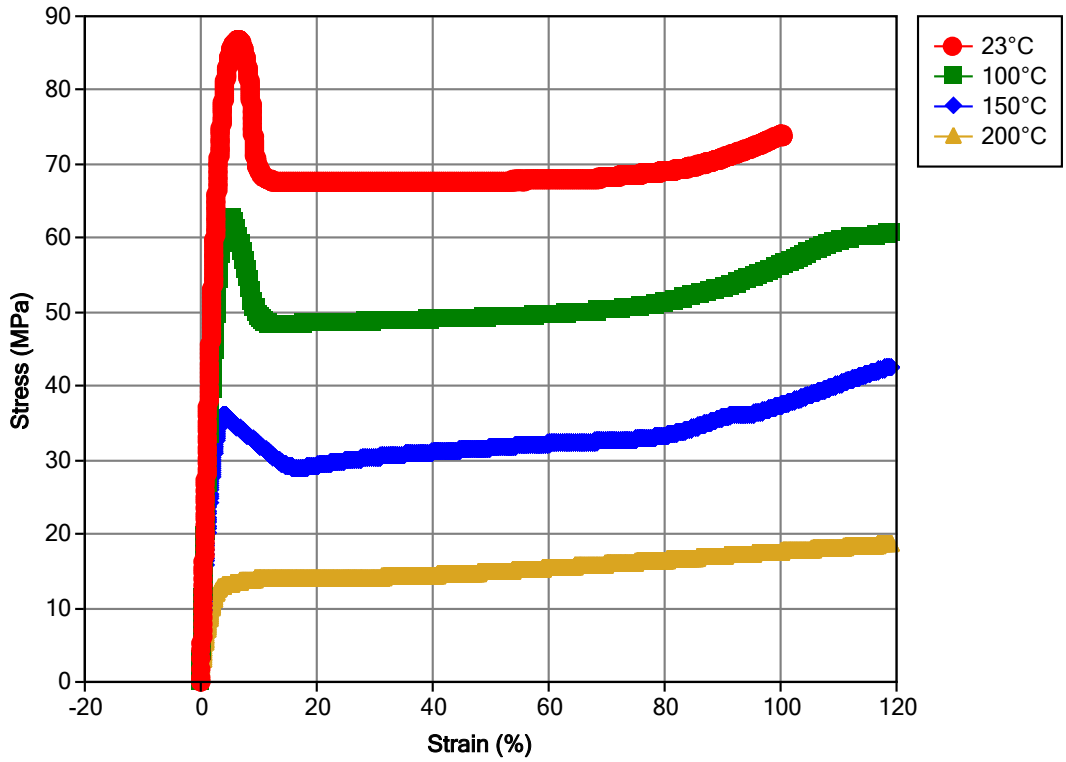
Isothermal Stress vs. Strain (ISO 11403)



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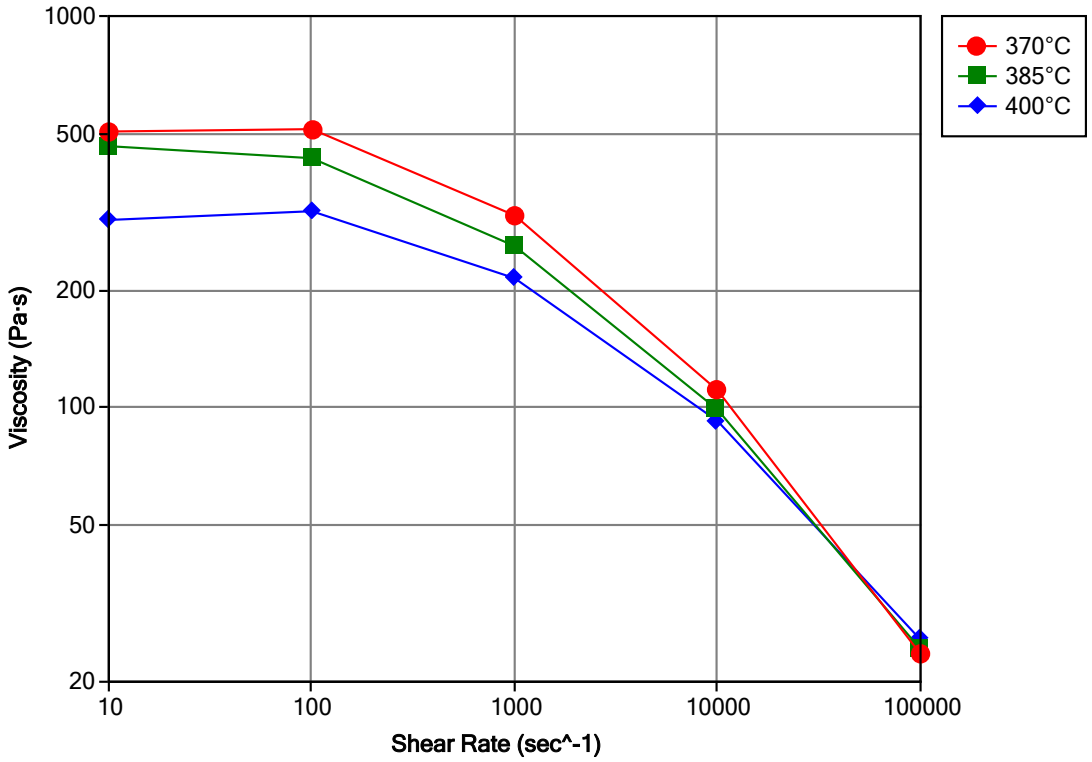
Viscosity vs. Shear Rate (ISO 11403)



Notes

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

[1] Passes 60s VB flame, smoke & toxicity.

[2] 5" x 0.5" x 0.125"

[3] 50 mm/min

[4] 2 hours at 200°C