

For more information and technical assistance contact:

Chevron Phillips Chemical Company LP
P.O. Box 4910
The Woodlands, TX 77387-4910
877.798.6666



Ryton[®] R-4-220

Polyphenylene Sulfide Resins

Ryton[®] R-4-220 PPS is an advanced 40% fiberglass reinforced polyphenylene sulfide compound formulated for enhanced hydrolytic stability in applications requiring constant or repeated exposure to high temperature water.

Nominal Engineering Properties ⁽¹⁾	R-4-220NA	R-4-220BL	Test Method
Tensile Strength, Ksi	27.0	25.0	ASTM D638
Elongation, %	1.6	1.5	ASTM D638
Flexural Strength, Ksi	39.0	36.0	ASTM D790
Flexural Modulus, Msi	2.1	2.1	ASTM D790
Notched Izod Impact, ft-lb/in, 1/8 in specimen	1.6	1.5	ASTM D256
Unnotched Izod Impact, ft-lb/in, 1/8 in specimen	12.0	10.0	ASTM D256
Compressive Strength, Ksi	40.0	40.0	ASTM D695
Heat Deflection Temperature 264 psi, °F	>500	>500	ASTM D648
UL Temperature Index, °C	200 / 220	200 / 220	UL 746B
Coefficient of Linear Thermal Exp., X 10 ⁻⁶ in/in/°C			ASTM E831
Axial Direction, -50°C to 50°C	15	15	
Axial Direction, 100°C to 200°C	15	15	
Transverse Direction, -50°C to 50°C	40	40	
Transverse Direction, 100°C to 200°C	85	85	
Flammability Rating	V-0	V-0	UL 94
Thermal Conductivity, BTU-in/hr-ft ² -°F	2.1	2.1	
Dielectric Strength, V/mil	550	550	ASTM D149
Dielectric Constant, 78° F			ASTM D150
1kHz	3.8	3.8	
1MHz	3.8	3.8	
Dissipation Factor, 78°F			ASTM D150
1 kHz	0.002	0.002	
1 MHz	0.003	0.003	
Volume Resistivity, ohm-cm	1 x 10 ¹⁶	1 x 10 ¹⁶	ASTM D257
Arc Resistance, sec	125	125	ASTM D495
Comparative Tracking Index, V	150	150	UL 746A
Mold Shrinkage ⁽²⁾ in/in, Flow/Transverse	0.003 / 0.005	0.003 / 0.005	

MSDS #100000000226

Revision Date July, 2009

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Density, g/cc	1.68	1.68	ASTM D792
Water Absorption, % (23°C, 24 hr)	0.02	0.02	ASTM D570
Color	Natural	Black	
Hydrolytic Stability ⁽³⁾			
Tensile Strength Retained, %	>80	>80	
Weight Gain, %	<1.0	<1.0	

(1) Test specimen molding conditions. Stock Temperature, 600-650° F; Mold Temperature, 275° F.

(2) Measured on 4 in X 4 in X 1/8 in Plaques, Edge Gated

(3) Test specimens aged 1000 hours in water at 140°C (284°F)

The nominal properties reported herein are typical of the product but do not reflect normal testing variances and therefore should not be used for specification purposes.

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Nominal Engineering Properties ⁽⁵⁾	R-4-220NA	R-4-220BL	Method
Tensile Strength, MPa	190	175	ISO 527
Elongation, %	1.6	1.4	ISO 527
Flexural Strength, MPa	270	245	ISO 178
Flexural Modulus, GPa	14	14	ISO 178
Notched Izod Impact, kJ/m ²	9.0	7.5	ISO 180A
Unnotched Izod Impact, kJ/m ²	40	35	ISO 180U
Compressive Strength, MPa	275	275	ISO 604
Heat Deflection Temperature 1.8 MPa, °C	>260	>260	ISO 75
UL Temperature Index, °C	200 / 220	200 / 220	UL 746B
Coefficient of Linear Thermal Exp., X 10 ⁻⁶ m/m/°C			ISO 11359-2
Axial Direction, -50°C to 50°C	15	15	
Axial Direction, 100°C to 200°C	15	15	
Transverse Direction, -50°C to 50°C	40	40	
Transverse Direction, 100°C to 200°C	85	85	
Flammability Rating	V-0	V-0	UL 94
Thermal Conductivity, W/m·K	0.31	0.31	
Dielectric Strength, kV/mm	22	22	ASTM D149
Dielectric Constant, 25°C			ASTM D150
1kHz	3.8	3.8	
1MHz	3.8	3.8	
Dissipation Factor, 25°C			ASTM D150
1 kHz	0.002	0.002	
1 MHz	0.003	0.003	
Volume Resistivity, ohm-cm	1 x 10 ¹⁶	1 x 10 ¹⁶	ASTM D257
Arc Resistance, sec	125	125	ASTM D495
Comparative Tracking Index, V	150	150	UL 746A
Insulation Resistance, ohm (90°C, 95% RH, 48 hr)	1 x 10 ¹²	1 x 10 ¹²	

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Mold Shrinkage ⁽⁶⁾ m/m, Flow/Transverse	0.003 / 0.005	0.003 / 0.005	
Density, g/cc	1.68	1.68	ISO 1183A
Water Absorption, %	0.02	0.02	ASTM D570
Color	Natural	Black	
Hydrolytic Stability ⁽⁷⁾			
Tensile Strength Retained, %	>80	>80	
Weight Gain, %	<1.0	<1.0	

(5) Test specimen molding conditions: Stock Temperature, 315-345° C; Mold Temperature 135° C

(6) Measured on 102 mm X 102 mm X 3.2 mm Plaques, Edge Gated

(7) Test specimens aged 1000 hours in water at 140°C

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