

Ryton® R-4-200BL polyphenylene sulfide

Ryton® R-4-200NA and R-4-200BL 40% glass fiber reinforced polyphenylene sulfide compounds provide enhanced mechanical strength and low

maintenance molding using conventional molding equipment

General		
Material Status	Commercial: Active	
Availability	Asia Pacific Latin America	
<u> </u>	• Europe • North America	
Filler / Reinforcement	Glass Fiber, 40% Filler by Weight	
Features	Good Strength	
Uses	Automotive Applications	
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	 CHRYSLER MS-DB-570 CPN3502 Color: Black FORD WSG-M4D807-A3 Color: Black FORD WSL-M4D807-A 	
Appearance	• Black	
Forms	• Pellets	
Processing Method	Injection Molding	
Physical	Typical Value Unit	Toot mothed
Physical Density / Specific Gravity	Typical Value Unit 1.68	Test method ASTM D792
Molding Shrinkage	1.00	ASTIVI D732
Flow: 3.20 mm	0.20 %	
Across Flow: 3.20 mm	0.50 %	
Water Absorption (24 hr, 23°C)	0.020 %	ASTM D570
Water Absorption (24111, 25 C)	0.020 /6	ASTIVI DO70
Mechanical	Typical Value Unit	Test method
Tensile Strength		
	179 MPa	ASTM D638
	185 MPa	ISO 527-2
Tensile Elongation (Break)	1.5 %	ASTM D638 ISO 527-2
Flexural Modulus		
	14500 MPa	ASTM D790
	14000 MPa	ISO 178
Flexural Strength		
	255 MPa	ASTM D790
	260 MPa	ISO 178
Compressive Strength	275 MPa	ASTM D695
Poisson's Ratio	0.40	ISO 527

Ryton° R-4-200BL polyphenylene sulfide

So No	Impact	Typical Value	Unit	Test method
Section Sec	Notched Izod Impact			
Unnotched Izod Impact 3.18 mm 530 J/m ASTM D4812 2 35 kJ/m² ISO 180 Hardness Typical Value Unit Test method R-Scale 100 R-Scale 100 R-Scale 120 Thermal Typical Value Unit Test method R-Scale 120 Thermal Typical Value Unit Test method R-Scale 120 Thermal Typical Value Unit Test method L8 MPa, Unannealed 265 °C	3.18 mm			ASTM D256
3.18 mm		8.0	kJ/m²	ISO 180/A
Hardness Typical Value Unit Test method	Unnotched Izod Impact			
Hardness	3.18 mm		•	ASTM D4812
Rockwell Hardness		35	kJ/m²	ISO 180
Rockwell Hardness	Hardness	Typical Value	Unit	Test method
R-Scale 120 Thermal Typical Value Unit Test method Deflection Temperature Under Load a STM D648 1.8 MPa, Unannealed 265 °C CLTE ASTM E831 Flow: -50 to 50°C 1.5E-5 cm/cm/°C Flow: 100 to 200°C 1.0E-5 cm/cm/°C Transverse: -50 to 50°C 4.0E-5 cm/cm/°C Transverse: 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 7468 Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms-cm ASTM D257 Volume Resistivity 1.0E+16 ohms-cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 3.90 25°C, 1 kHz 3.90 3.80 Dissipation Factor ASTM D150 25°C, 1 kHz 2.0E-3 3.25°C, 1 kHz 25°C, 1 kHz 2.0E-3 3.25°C, 1 kHz 3.20E-3	Rockwell Hardness	,		ASTM D785
Thermal Typical Value Unit Test method Deflection Temperature Under Load 1.8 MPq, Unannealed 265 °C CLTE ASTM D648 Flow: -50 to 50°C 1.5E-5 cm/cm/°C Flow: 100 to 200°C 1.0E-5 cm/cm/°C Transverse: -50 to 50°C 4.0E-5 cm/cm/°C Transverse: 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 7468 Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 25°C, 1 kHz 25°C, 1 kHz 3.80 3.80 Dissipation Factor ASTM D150 ASTM D150 25°C, 1 kHz 2.0E-3 25°C, 1 kHz	M-Scale	100		
Deflection Temperature Under Load ASTM D648 1.8 MPa, Unannealed 265 °C CLTE ASTM E831 Flow: -50 to 50°C 1.5E-5 cm/cm/°C Flow: 100 to 200°C 1.0E-5 cm/cm/°C Transverse: -50 to 50°C 4.0E-5 cm/cm/°C Transverse: 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 7468 Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms-cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 25°C, 1 kHz 25°C, 1 kHz 3.80 ASTM D150 25°C, 1 kHz 3.80 ASTM D150 25°C, 1 kHz 2.0E-3 ASTM D495 25°C, 1 kHz 2.0E-3 ASTM D495 25°C, 1 kHz 2.0E-3 ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 175 V	R-Scale	120		
Deflection Temperature Under Load ASTM D648 1.8 MPa, Unannealed 265 °C CLTE ASTM E831 Flow: -50 to 50°C 1.5E-5 cm/cm/°C Flow: 100 to 200°C 1.0E-5 cm/cm/°C Transverse: -50 to 50°C 4.0E-5 cm/cm/°C Transverse: 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 7468 Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms·cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 3.90 25°C, 1 kHz 3.80 3.80 Dissipation Factor ASTM D150 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 3.80 25	Thermal	Typical Value	Unit	Test method
1.8 MPq, Unannealed		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		ASTM D648
CLTE ASTM E83I Flow: -50 to 50°C 1.5E-5 cm/cm/°C Flow: 100 to 200°C 1.0E-5 cm/cm/°C Transverse: -50 to 50°C 4.0E-5 cm/cm/°C Transverse: 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 7468 Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms om ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 25°C, 1 kHz 25°C, 1 kHz 3.80 3.80 Dissipation Factor ASTM D150 ASTM D150 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 1.0E+16 ohms ASTM D150 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 1.0E+16 ohms 1.0E+16 ohms Comparative Tracking Index (CTI) <t< td=""><td>·</td><td>265</td><td>°C</td><td></td></t<>	·	265	°C	
Flow: -50 to 50 °C 1.5E-5 cm/cm/°C Flow: 100 to 200 °C 1.0E-5 cm/cm/°C Transverse: -50 to 50 °C 4.0E-5 cm/cm/°C Transverse: 100 to 200 °C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 746B Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms·cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 25°C, 1 kHz 25°C, 1 kHz 3.80 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 1.0E+11 ohms 1.0E+11 ohms Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 1.75 V IEC 60112 Insulation Resistance 1 (90°C) 1.0E+11 ohms 1.0E				ASTM E831
Flow: 100 to 200°C 1.0E-5 cm/cm/°C Transverse: -50 to 50°C 4.0E-5 cm/cm/°C Transverse: 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 746B Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 25°C, 1 kHz 25°C, 1 kHz 3.90 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 2.0E-3 2.0E-3 25°C, 1 kHz 1.0E+11 ohms 1.0E+11 ohms Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 1.75 V IEC 60112 Insulation Resistance 1 (90°C) 1.0E+11 ohms		1.5E-5	cm/cm/°C	
Transverse : -50 to 50°C 4.0E-5 cm/cm/°C Transverse : 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 7468 Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms·cm ASTM D257 Volume Resistivity 1.0E+16 ohms·cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 25°C, 1 kHz 25°C, 1 kHz 3.80 3.80 Dissipation Factor ASTM D150 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 25°C, 1 kHz 25°C, 1 kHz 2.0E-3 25°C, 1 kHz 25°C, 1 MHz 2.0E-3 25°C, 1 kHz 25°C, 1 MHz 2.0E-3 20E-3 25°C, 1 MHz 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 175 V IEC 60112 Insulation Resistance¹ (90°C) 1.0E+11 ohms Flammability Typical Value Unit </td <td>Flow: 100 to 200°C</td> <td></td> <td></td> <td></td>	Flow: 100 to 200°C			
Transverse : 100 to 200°C 8.5E-5 cm/cm/°C Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 746B Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms·cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D150 25°C, 1 kHz 3.90 3.90 25°C, 1 kHz 3.80 ASTM D150 25°C, 1 kHz 2.0E-3 ASTM D150 25°C, 1 kHz 2.0E-3 ASTM D495 25°C, 1 kHz 2.0E-3 ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index (D0°C) 1.0E+11 ohms Flammability Typical Value Unit Test method Flammability V-0 5VA UL 94				
Thermal Conductivity 0.33 W/m/k UL Temperature Rating 200 to 220 °C UL 746B Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms·cm ASTM D257 Dielectric Strength 22 kV/mm ASTM D149 Dielectric Constant ASTM D150 ASTM D150 25°C, 1 kHz 3.90 ASTM D150 25°C, 1 kHz 3.80 ASTM D150 Dissipation Factor ASTM D150 ASTM D150 25°C, 1 kHz 2.0E-3 ASTM D495 25°C, 1 kHz 2.0E-3 ASTM D495 Arc Resistance 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 175 V IEC 60112 Insulation Resistance¹ (90°C) 1.0E+11 ohms Flammability Typical Value Unit Test method Flammability V-0 5VA UL 94	Transverse: 100 to 200°C			
Electrical Typical Value Unit Test method Surface Resistivity 1.0E+16 ohms ASTM D257 Volume Resistivity 1.0E+16 ohms ASTM D257 Dielectric Strength 22 kV/mm ASTM D149 Dielectric Constant ASTM D150 25°C, 1 kHz 3.90 25°C, 1 MHz 3.80 Dissipation Factor ASTM D150 25°C, 1 kHz 2.0E-3 25°C, 1 MHz 2.0E-3 Arc Resistance 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index Insulation Resistance (90°C) 1.0E+11 ohms Flame Rating (1.6 mm) Typical Value Unit Test method Flame Rating (1.6 mm) UL 94	Thermal Conductivity			
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Dielectric Strength Dielectric Constant 25°C, 1 kHz 25°C, 1 kHz 3.90 25°C, 1 MHz 3.80 Dissipation Factor 25°C, 1 kHz 2.0E-3 25°C, 1 MHz ASTM D150 25°C, 1 kHz 2.0E-3 25°C, 1 MHz 2.0E-3 Arc Resistance 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 175 V IEC 60112 Insulation Resistance Flammability Typical Value Unit Test method Flame Rating (1.6 mm) UL 94				
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25°C, 1 MHz 3.80 Dissipation Factor ASTM D150 25°C, 1 kHz 2.0E-3 25°C, 1 MHz 2.0E-3 Arc Resistance 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 175 V IEC 60112 Insulation Resistance 1 (90°C) 1.0E+11 ohms Flammability Typical Value Unit Test method Flame Rating (1.6 mm) V-0 UL 94		3.90		
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Arc Resistance 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 175 V IEC 60112 Insulation Resistance (90°C) 1.0E+11 ohms Flammability Typical Value Unit Test method V-0 Flame Rating (1.6 mm) V-0 UL 94	25°C, 1 kHz	2.0E-3		
Comparative Tracking Index (CTI) Comparative Tracking Index Insulation Resistance 1 (90°C) Flammability Flammability Flammability Typical Value Unit V-0 SVA UL 746A UL 746A	25°C, 1 MHz	2.0E-3		
Comparative Tracking Index 175 V IEC 60112 Insulation Resistance¹ (90°C) 1.0E+11 ohms Flammability Typical Value Unit Test method Flame Rating (1.6 mm) V-0 UL 94	Arc Resistance	125	sec	ASTM D495
Insulation Resistance¹ (90°C) 1.0E+11 ohms Flammability Typical Value Unit V-0 Flame Rating (1.6 mm) UL 94	Comparative Tracking Index (CTI)	PLC 4		UL 746A
Flammability Typical Value Unit Test method Flame Rating (1.6 mm) V-0 5VA UL 94	Comparative Tracking Index	175	V	IEC 60112
Flame Rating (1.6 mm) • V-0 • 5VA UL 94	Insulation Resistance¹ (90°C)	1.0E+11	ohms	
Flame Rating (1.6 mm) • V-0 • 5VA UL 94	Flammability	Typical Value	Unit	Test method
• 5VA				
Oxygen Index 57 % ASTM D2863	Oxygen Index	57	%	ASTM D2863

Ryton° R-4-200BL polyphenylene sulfide

Injection	Typical Value Unit	
Drying Temperature	135 to 150 °C	
Drying Time	2.0 to 4.0 hr	
Rear Temperature	295 to 315 °C	
Middle Temperature	305 to 325 °C	
Front Temperature	315 to 345 °C	
Nozzle Temperature	305 to 325 °C	
Processing (Melt) Temp	320 to 330 °C	
Mold Temperature	135 to 150 °C	

Notes

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

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¹ 95%RH, 48 hr