Ryton® R-4-200BL

Polyphenylene Sulfide Syensqo



Technical Data

Product I	

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

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Processing Method

General	
Material Status	Commercial: Active
Literature ¹	Technical Datasheet
UL Yellow Card ²	• E95746-102108309
Search for UL Yellow Card	SyensqoRyton®
Availability	Asia PacificEuropeNorth America
Filler / Reinforcement	Glass Fiber, 40% Filler by Weight
Features	Good Strength
Uses	Automotive Applications
RoHS Compliance	RoHS Compliant
Appearance	Black
Forms	• Pellets

Physical	Nominal Value Unit	Test Method
Density / Specific Gravity	1.68 g/cm ³	ASTM D792
Molding Shrinkage		
Flow: 3.20 mm	0.20 %	
Across Flow: 3.20 mm	0.50 %	
Water Absorption (24 hr, 23°C)	0.020 %	ASTM D570
Mechanical	Nominal 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

Form No. TDS-41602-en

· Injection Molding

PR	OS	PE	CT	0	R	R

Notched Izod Impact 80 J/m ASTM D256 - 8.0 kJ/m² ISO 180/A Unnotched Izod Impact S3.18 mm ASTM D4812 3.18 mm 530 J/m ASTM D4812 3.18 mm S50 J/m ASTM D4812 3.18 mm S50 J/m ASTM D4812 3.18 mm Nominal Value Unit Test Method Rockwell Hardness 100 ASTM D785 M-Scale 120 Test Method R-Scale 120 ASTM D481 Thermal Nominal Value Unit Test Method Deflection Temperature Under Load 265 °C ASTM D481 1.8 MPa, Unannealed 265 °C ASTM D481 CLTE ASTM D481 ASTM D481 Flow: -50 to 50 °C 1.0E-5 cm/cm/°C ASTM E831 Flow: -50 to 50 °C 1.0E-5 cm/cm/°C UL 746B Taransverse: -50 to 50 °C 4.0E-5 cm/cm/°C UL 746B Thermal Conductivity 0.33 W/m/K UL T46B UL Temperature Rating 20 to 220 °C UL 746B Electrical			
3.18 mm 80 J/m² ASTM D256 8.0 kJ/m² 150 160/A 1.18 mm 530 J/m ASTM D4812 3.18 mm 530 J/m ASTM D4812 35 kJ/m² ISO 180 Hardness Nominal Value Unit Test Method Rockwell Hardness ASTM D785 M-Scale 100 Test Method R-Scale 120 ASTM D648 1.8 MPa, Unannealed 265 °C ASTM D648 1.8 MPa, Unannealed 265 °C ASTM E831 Flow: -50 to 50°C 1.5E-5 cm/cm/n°C ASTM E831 Flow: -50 to 50°C 1.5E-5 cm/cm/n°C Transverse: 50 to 50°C 4.9E-5 cm/cm/n°C Transverse: 100 to 200°C U.746B Thermal Conductivity 0.33 W/mr/K U.746B U.746B Electrical Nominal Value Unit Test Method Surface Resistivity 1.0E+16 ohms cm ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Dielectric Strength	Impact	Nominal Value Unit	Test Method
So No Normal			
Unnotched Izod Impact	3.18 mm	80 J/m	ASTM D256
3.18 mm 530 J/m ASTM D4812 35 kJ/m² 150 180 Hardness Mominal Value Unit Test Method R-Scale 100 STM D785 M-Scale 100 STM D785 R-Scale 100 STM D648 Thermal Nominal Value Unit Test Method Beflection Temperature Under Load 256°C ASTM E81 1. 80 ± 50 to 50°C 1. 5E-5 cm/cm/°C ASTM E81 Flow: 50 to 50°C 1. 5E-5 cm/cm/°C ASTM E81 Flow: 100 to 200°C 3. 5E-5 cm/cm/°C ASTM E81 Transverse: 50 to 50°C 4. 0E-5 cm/cm/°C U. 746B Transverse: 100 to 200°C 3. 5E-5 cm/cm/°C U. 746B Temmal Conductivity 0.33 W/m/K U. 746B U. Temperature Rating 200 to 220°C U. 746B Surface Resistivity 1.0E+16 ohms cm ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM		8.0 kJ/m²	ISO 180/A
Part	Unnotched Izod Impact		
Nominal Value Unit Test Method	3.18 mm	530 J/m	ASTM D4812
Rockwell Hardness ASTM D785 M-Scale R-Scale 100 120 R-Scale 120 Thermal Nominal Value Unit Test Method Deflection Temperature Under Load 1.8 MPa, Unannealed 265 °C ASTM D648 1.8 MPa, Unannealed 265 °C ASTM E831 Flow: 50 to 50°C 1.5E-5 cm/cm/°C Flow: 50 to 50°C 4.0E-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 UL 746B Temmal Conductivity 0.33 Wm/K Very Compensative Rating 200 to 220 °C UL 746B Electrical Nominal Value Unit Test Method ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D257 Dielectric Strength 22 kV/rmm ASTM D150 25°C, 1 kHz 3.90 25 °C, 1 kHz ASTM D150 25°C, 1 kHz 2.0E-3 ASTM D150 25°C, 1 kHz 2.0E-3 ASTM D495 Comparative Tracking Ind		35 kJ/m²	ISO 180
M-Scale 100 R-Scale 120 Thermal Nominal Value Unit Test Method Deflection Temperature Under Load 265 °C 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 Temperature Rating 200 to 220 °C UL 7468 Electrical Nominal 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 D150 25°C, 1 kHz 3.90	Hardness	Nominal Value Unit	Test Method
R-Scale Nominal Value Unit Test Method Deflection Temperature Under Load 265 °C 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 Transverse: 100 to 200°C 0.33 W/m/K UL Temperature Rating 200 to 220 °C UL 7468 Electrical Nominal Value Unit Test Method Surface Resistivity 1.0E+16 ohms cm ASTM D257 Volume Resistivity 1.0E+16 ohms cm ASTM D150 Dielectric Constant 25 V/m ASTM D150 25°C, 1 kHz 3.90 STM D150 25°C, 1 kHz 3.80 STM D150 25°C, 1 kHz 2.0E-3 STM D146 <	Rockwell Hardness		ASTM D785
Thermal Nominal Value Unit Test Method Deflection Temperature Under Load 265 °C 1.8 MPa, Unannealed 265 °C CLTE ASTM E831 Flow: -50 to 50 °C 1.5E-5 cm/cm/°C Flow: -50 to 50 °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 Wm/K UL Temperature Rating 20 to 220 °C UL 746B Electrical Nominal 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 D45 25°C, 1 kHz 2.0E-3 ASTM D45 <td>M-Scale</td> <td>100</td> <td></td>	M-Scale	100	
Deflection Temperature Under Load 1.8 MPa, Unannealed 265 °C	R-Scale	120	
1.8 MPa, Unannealed	Thermal	Nominal Value Unit	Test Method
1.8 MPa, Unannealed	Deflection Temperature Under Load		ASTM D648
Flow : -50 to 50°C		265 °C	
Flow : 100 to 200°C	CLTE		ASTM E831
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 Nominal 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 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 175 V IEC 60112 Insulation Resistance ⁴ (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flammability Nominal Value Unit Test Method	Flow: -50 to 50°C	1.5E-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 Nominal 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 MHz 3.80 ASTM D150 25°C, 1 kHz 2.0E-3 ASTM D150 25°C, 1 MHz 2.0E-3 ASTM D450 25°C, 1 MHz 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 Resistance ⁴ (90°C) Nominal Value Unit Test Method Flammability Nominal Value Unit Test Method	Flow: 100 to 200°C	1.0E-5 cm/cm/°C	
Thermal Conductivity 0.33 W/m/K UL Temperature Rating 200 to 220 °C UL 746B Electrical Nominal 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 D49 Dielectric Constant ASTM D150 ASTM D150 25°C, 1 kHz 3.90 ASTM D150 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 MHz 2.0E-3 ASTM D495 Arc Resistance 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flammability Nominal Value Unit Test Method Flammability Nominal Value Unit Test Method	Transverse : -50 to 50°C	4.0E-5 cm/cm/°C	
UL Temperature Rating 200 to 220 °C UL 746B Electrical Nominal 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 25°C, 1 kHz 3.90 ASTM D150 25°C, 1 MHz 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 MHz 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 Resistance ⁴ (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flam Rating (1.6 mm) V-0 UL 94	Transverse: 100 to 200°C	8.5E-5 cm/cm/°C	
UL Temperature Rating 200 to 220 °C UL 746B Electrical Nominal 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 25°C, 1 kHz 3.90 ASTM D150 25°C, 1 MHz 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 MHz 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 Resistance ⁴ (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flam Rating (1.6 mm) V-0 UL 94	Thermal Conductivity	0.33 W/m/K	
Electrical Nominal 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 25°C, 1 kHz 3.90 ASTM D150 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 Arc Resistance 125 sec ASTM D495 Comparative Tracking Index (CTI) PLC 4 UL 746A Comparative Tracking Index 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 5VA UL 94		200 to 220 °C	UL 746B
Volume Resistivity 1.0E+16 ohms·cm 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 175 V IEC 60112 Insulation Resistance 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 oh UL 94	Electrical	Nominal Value Unit	Test Method
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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 175 V IEC 60112 Insulation Resistance 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 SVA UL 94	•	1.0E+16 ohms·cm	ASTM D257
Dielectric Constant 25°C, 1 kHz 25°C, 1 MHz 3.80 Dissipation Factor 25°C, 1 kHz 25°C, 1 MHz 3.80 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 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) UL 94		22 kV/mm	ASTM D149
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 175 V IEC 60112 Insulation Resistance 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 5VA UL 94			
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 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 UL 94		3.90	
Dissipation Factor 25°C, 1 kHz 25°C, 1 kHz 25°C, 1 MHz 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 4 (90°C) Flammability Nominal Value Unit Flame Rating (1.6 mm) ASTM D150 ASTM D150 LOE-3 ASTM D495 ASTM D495 ASTM D495 ASTM D495 LOE-3 ASTM D495 ASTM D495 LOE-3 ASTM D495 LOE-3 ASTM D495 LOE-3 ASTM D495 LOE-3 ASTM D495 LOE-4 UL 746A UL 746A UL 746A UL 746A UL 94		3.80	
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 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 UL 94			ASTM D150
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 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 SVA UL 94	•	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 4 (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 5VA UL 94			
Comparative Tracking Index (CTI) Comparative Tracking Index Insulation Resistance 4 (90°C) Flammability Resistance 4 (90°C) Flame Rating (1.6 mm) PLC 4 UL 746A IEC 60112 Insulation Resistance 4 (90°C) Nominal Value Unit V-0 5VA UL 94	•		ASTM D495
Comparative Tracking Index 175 V IEC 60112 Insulation Resistance ⁴ (90°C) 1.0E+11 ohms Flammability Nominal Value Unit Test Method Flame Rating (1.6 mm) V-0 5VA UL 94			
Insulation Resistance 4 (90°C) Flammability Nominal Value Unit Flame Rating (1.6 mm) Test Method V-0 5VA UL 94			
Flammability Nominal Value Unit V-0 5VA UL 94	·		
Flame Rating (1.6 mm) • V-0 5VA UL 94			Test Method
Flame Rating (1.6 mm) • 5VA UL 94	i iaininasiiity		Test Welliou
Oxygen Index 57 % ASTM D2863	Flame Rating (1.6 mm)		UL 94
	Oxygen Index	57 %	ASTM D2863

Notes

⁴ 95%RH, 48 hr



2 of 2

Form No. TDS-41602-en

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL Prospector continually works to link Yellow Cards to individual plastic materials in Prospector, however this list may not include all of the appropriate links. It is important that you verify the association between these Yellow Cards and the plastic material found in Prospector. For a complete listing of Yellow Cards, visit the UL Yellow Card Search.

³ Typical properties: these are not to be construed as specifications.