CE 221

CE 221 is a high performance material with excellent strength, stiffness, and temperature resistance (231 °C).

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Tensile Properties ASTM D638, Type V, 1 mm/min	Metric	U.S.
Tensile Modulus	3870 ± 140 MPa	561 ± 20 ksi
Ultimate Tensile Strength	92 ± 13 MPa	13 ± 2 ksi
Elongation at Break	3.3 ± 0.8 %	

Flexural Properties ASTM D790-A	Metric	U.S.
Flexural Strength	131 ± 27 MPa	19 ± 4 ksi
Flexural Modulus (chord, 0.5-1 % strain)	3780 ± 113 MPa	548 ± 16 ksi

Impact Properties	Metric	U.S.
Notched Izod (Machined), ASTM D256	15 ± 1 J/m	0.28 ± 0.02 ft-lb/in
Unnotched Izod, ASTM D4812	291 ± 46 J/m	5.5 ± 0.9 ft-lb/in
Notched Charpy, ISO 179-1/1eA	1.23 ± 0.22 kJ/m^2	0.585 ± 0.105 ft-lb/in^2

Thermal Properties	Metric	U.S.
Heat Deflection Temperature @ 0.455 MPa/66 psi, ASTM D648	231 °C	448 °F
Heat Deflection Temperature @ 1.82 MPa/264 psi, ASTM D648	201 °C	394 °F
Coefficient of Thermal Expansion (-60, 100 °C), ASTM E831	52 ppm/°C	29 ppm/°F
Coefficient of Thermal Expansion (100, 180 °C), ASTM E831	90 ppm/°C	50 ppm/°F
Coefficient of Thermal Expansion (180, 200 °C), ASTM E831	147 ppm/°C	82 ppm/°F
Heat Capacity, 23 °C, ASTM E1269	1.17 J/g-°C	0.279 BTU/lb-°F
Thermal Conductivity, ASTM C518	0.167 W/m-k	0.097 BTU/hr-ft-°F

Electrical Properties	Metric
Dielectric Strength, ASTM D149	22.0 kV/mm
Dielectric Constant, 1 kHz, ASTM D150	3.12
Dissipation Factor, 1 kHz, ASTM D150	0.00456
Volume Resistivity, ASTM D257	2.24E+14 ohm-cm

General Properties	Metric
Hardness, ASTM D2240	92, Shore D
Density, ASTM D792	1.210 g/cm^3
Density (liquid resin)	1.15 g/cm^3
Water Absorption, 23 °C, 24 hours, ASTM D570	0.21 %
Water Absorption, 23 °C, long term, ASTM D570	0.55 %
Taber Abrasion, ASTM D4060, CS-17, 1 kg, 100 % vacuum	36 mg / 1000 cycles

NOTES—Results in this data sheet are representative of specific sample generation and testing processes and may vary if the established protocols are not followed. Contact Carbon for the specific process used to generate the test samples to determine each of these values. Tensile and flexural data are average ± 1 standard deviation from 16 specimens; impact data used 10 specimens. The U.S. values are converted from Metric measurements and are for reference only.

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We produce.

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