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Grade: PG-HT

Manufacturer: Minteq International Inc.

Method of Manufacturing: Hydrocarbon gas decomposition

Description: Pyrolytic Graphite (HT) grade is similar to Substrate Nucleated (SN) grade of pyrolytic graphite but is thermally annealed to increase thermal conductivity. The increase in conductivity is about four times that of PG SN grade or more than four times better than copper. The material is deposited as graphene onto a substrate giving it a layered composition and is anisotropic. This also means it has different properties in one of the two dimensional planes. In the C plane (across its layers) it has low thermal conductivity, acting as an insulator. In the A-B plane (with the layers) it has very high thermal conductivity, acting as a superb conductor. All values are taken at room temperature, unless noted otherwise.

Physical Properties for Pyroid® HT Pyrolytic Graphite

Property	Direction*	Metric Units	English Units
Density	---	2.26 g/cc	136 lb/ft3
Yield Strength	a	38 MPa	5,500 psi
	b	2.4 MPa	348 psi
Ultimate Tensile Strength	a	80 MPa	11,600 psi
	z	3 MPa	435 psi
Flexural Modulus	a	27 GPa	3.9×10^6 psi
	z	1.3 GPa	188,500 psi
Young's Modulus	a	50 GPa	7.25×10^6 psi
	z	3 GPa	435,000 psi
Shear Modulus	a	11 MPa	1,600 psi
	z	7 MPa	1,000 psi
Poisson's Ratio	a	-0.18	-
	z	0.20	-
Coefficient Thermal Expansion			
Room Temperature	a	-4.39×10^{-7} cm/cm°C	$-2.49.0 \times 10^{-7}$ in/in°F
2000°C	a	7.48×10^{-7} cm/cm°C	4.26×10^{-7} in/in°F
Room Temperature	c	26.4×10^{-6} cm/cm°C	14.9×10^{-6} in/in°F
2000°C	c	29.8×10^{-6} cm/cm°C	16.9×10^{-6} in/in°F
Thermal Conductivity			
Room Temperature	a	1700 W/m°K	2933 BTU/(hr ft2)(°F/ft)
1650°C	a	430 W/m°K	742 BTU/(hr ft2)(°F/ft)
Room Temperature	c	7 W/m°K	4.0 BTU/(hr ft2)(°F/ft)
1650° C	c	5.3 W/m°K	3.0 BTU/(hr ft2)(°F/ft)
Electric Resistivity			
Room Temperature	a	693 μΩcm	
1650°C	a	277 μΩcm	
Room Temperature	c	0.6 Ωcm	
1650°C	c	0.22 Ωcm	
Oxidation Threshold		650°C	1200°F
Permeability		Helium Leak Tight at 10-6 mmHg	

*a: Along basal planes (across surface)
c: Through basal planes (through thickness)