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Grade: PG-CN

Manufacturer: Minteq International Inc.

Method of Manufacturing: Hydrocarbon gas decomposition

Description: Pyrolytic Graphite (Continuously Nucleated) and has physical properties of about 15-20% higher than Substrate Nucleated (PG SN) grade of pyrolytic graphite. The material is manufactured by decomposition of a hydrocarbon gas at very high temperature in a vacuum furnace. The result is an ultra-pure product which is near theoretical density and extremely anisotropic. 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 Continuously Nucleated (CN) Pyrolytic Graphite

Property	Direction*	Metric Units	English Units
Density	---	2.19 g/cc	136 lb/ft3
Flexural Strength			
Room Temperature	a	840 kg/cm2	12,000 psi
2750°C	a	3,500 kg/cm2	50,000 psi
Compressive Strength			
Room Temperature	a	1,200 kg/cm2	17,500 psi
	c	3,565 kg/cm2	52,000 psi
Shear Strength			
Room Temperature	a	1020 kg/cm2	14,500 psi
Coefficient Thermal Expansion			
Room Temperature	a	$0.066x10^{-6}$ cm/cm°C	$0.036x10^{-6}$ in/in°F
2200°C	a	$1.49x10^{-6}$ cm/cm°C	$0.83x10^{-6}$ in/in°F
Room Temperature	c	$23.9x10^{-6}$ cm/cm°C	$13.28\ x10^{-6}$ in/in°F
2200°C	c	$25.0x10^{-6}$ cm/cm°C	$13.88x10^{-6}$ in/in°F
Thermal Conductivity			
Room Temperature	a	440 W/m°K	255 BTU/(hr ft2)(°F/ft)
1650°C	a	114 W/m°K	66 BTU/(hr ft2)(°F/ft)
Room Temperature	c	1.73 W/m°K	1.00 BTU/(hr ft2)(°F/ft)
3000°F	c	1.30 W/m°K	0.75 BTU/(hr ft2)(°F/ft)
Electric Resistivity			
Room Temperature	a	500 $\mu\Omega$cm	
1650°C	a	200 $\mu\Omega$cm	
Room Temperature	c	0.6 Ωcm	
1650°C	c	0.22 Ωcm	
Scleroscope Hardness	a	101	101
	c	83	83
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)