POCO

Moving Technology Forward

THERMAL MANAGEMENT MATERIAL

POCO FOAM®

Typical Material Properties

	AVERAGE
Thermal Conductivity	
Out of Plane	135 W/mK 78 BTU•ft/ft²•hr•°F
In Plane	45 W/mK 26 BTU•ft/ft²•hr•°F
Oxidation Resistance (in oxygen atmosphere)	400°C
Heat Capacity	0.7 J/g-K 0.17 BTU/lb•°F
Purity	
	Bulk< 100 ppm impurities
	Purified < 9ppm impurities
Structure	
Avg. Pore Diameter	350 Microns/0.0138 in
Open Porosity	96%
Total Porosity	75%
Density	.55 g/cc 34 lb/ft3
CTE	
Out of Plane	50 TO 400°K -0.7ppm/°C (-233 to 127°C)
Out of Plane	573 to 1273°K 0.0 to 0.8ppm/°C (300 to 1000°C)
In Plane	50 TO 400°K 0.6ppm°C (-233 to 127°C)
In Plane	573 to 1273°K 1.3 to 2.0ppm/°C (300 to 1000°C)
Cryogenic Data supplied by Composite Optics, Inc.	
Compressive Strength	
Out of Plane	435psi 3.0 Mpa at 0.55g/cc (34 lb/ft3)

PocoFoam is a unique graphite foam material for advanced thermal management solutions. This material is a lightweight, graphite foam with exceptionally high thermal conductivity and very efficient energy transfer characteristics.

PocoFoam is produced through a patented foaming process that creates a structure of highly aligned graphitic ligaments within the foam's cell walls. These ligaments are the key to the material's high thermal conductivity, wicking heat away from the source.

PocoFoam has thermal conductivity up to 10 times higher than metallic foam materials, such as aluminum foam.

When compared to aluminum, samples of graphite foam are five times lighter yet demonstrate nearly equal thermal conductivity. PocoFoam's heat transfer efficiencies have been shown in laboratory testing to be significantly greater than aluminum or copper.

As the demand for smaller, lighter and more efficient thermal management systems increases, PocoFoam's combination of thermal management properties and physical characteristics provide exciting design opportunities for new and existing applications.

The unique PocoFoam material permits design flexibility that may radically change future shapes, sizes and locations of some very familiar thermal management systems.

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POCO GRAPHITE pocoFOAM™

Poco Graphite, Inc., 300 Old Greenwood Rd., Decatur, Texas 76234 USA • 1-800-433-5547 (Toll Free) • 1-940-627-2121 • Fax: 1-940-393-8366 • http://www.poco.com • e-mail: info@poco.com
EUROPEAN REGIONAL OFFICES • Poco Graphite, SARL, 1, rue des Vergers, 69760 Limonest - France • Tel: +33 (0)4 72 52 00 40 • Fax: +33 (0)4 72 52 00 49 • e-mail: sales@poco-graphite.fr

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Material Features

- *THIS MATERIAL IS AN OPEN CELL FOAM—approximately 95% of the available porosity is accessible. The material has a low outgassing rate; total mass loss is 0.031% as tested by ASTM E595 method.*
- *THE SURFACE AREA OF THE FOAM IS MORE THAN 4 M2/G.*
- *POCOFOAM IS RESISTANT TO ATTACK BY MOST ACIDS.*
- *EXTREMELY LOW LEVELS OF IMPURITY (LESS THAN 10PPM) ARE POSSIBLE USING POCO'S PROPRIETARY AND PROVEN PURIFICATION PROCESS.*

Thermal Properties

Material	ρ (g/cm³)	λ (W/mK)	C_p (J/gK)	TD (cm²/s)
AXM-5Q	1.74	85	0.70	0.70
Diamond	3.51	900	0.51	5.03
Pure Al	2.70	247	0.90	1.02
6061-T0	2.70	180	0.90	0.74
6061-T4	2.70	154	0.90	0.63
6061-T6	2.70	167	0.90	0.69
Pure Cu	8.93	398	0.38	1.17
C23000	8.75	159	0.38	0.48
C60800	8.17	80	0.38	0.26
C65100	8.75	57	0.38	0.17
C70600	8.94	40	0.38	0.12
Silver	10.49	428	0.23	1.77
PocoFoam	0.55	135	0.70	3.59

PocoFoam is 5.4 times lighter per unit volume compared to Pure Aluminum.

PocoFoam is 17.9 times lighter per unit volume compared to Pure Copper.

PocoFoam has a 3.7 times higher TD compared to Pure Aluminum.

PocoFoam has a 3.2 times higher TD compared to Pure Copper.

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