



Spectra-Mat, Inc.

100 Westgate Drive
Watsonville, CA 95076
phone: 831-722-4116
fax: 831-722-4172
www.spectramat.com

TECHNICAL BULLETIN

Thermal Management Materials for Photonics & Electronic Packaging

Typical Physical & Thermal Properties

Controlled Expansion Composites (CEC) offered by SMI

Material Description	Material Composition	CTE ($\times 10^{-6}/K$) 25°C - 400°C	TC (W/m \cdot K) 25°C	Density (g/cm 3)
Tungsten Copper	W/Cu (Wt %)			
	90/10	6.4	201	17.2
	85/15	7.0	210	16.6
	80/20	7.6	219	16.2
	75/25	8.1	228	15.7
Molybdenum Copper	Mo/Cu (Wt %)			
	85/15	6.9	154	10.0
	80/20	7.5	164	9.9
	75/25	8.0	174	9.8
Tungsten Alloy	W/Ni/Cu (Wt %) 95/3.5/1.5	5.2	75	18.2
Semiconductor Materials	GaAs	6.5	54	5.3
	GaN	3.2	150	6.1
	InP	4.5	68	4.8
	Si	4.2	151	2.3
	SiC	3.5-5.0	340	3.2
Ceramics	AlN	4.6	200	3.3
	Al $_2$ O $_3$	6.7	17	3.6
	BeO	7.6	250	2.9
Typical Metals	Al	26.4	210	2.7
	Cu	17.8	398	8.9
	Kovar	5.3	17	8.4
	Mo	5.5	138	10.2
	W	4.6	178	19.3

Common Materials