saes group SMI a SAES Group company Spectra-Mat, Inc.

TECHNICAL BULLETIN

Typical Low Expansion Composites Physical & Thermal Properties

Thermal Management Components for High Reliability and Performance Applications

Material Description	Material Composition	CTE (x10 $^{-6}$/K) 25°C - 400°C	TC (W/m•K)(g/cm 25°C	Density ^{3})
Low Expansion Composites (LEC) offered by SMI				
Tungsten Copper WC	W/Cu (Wt %)			
	90/10	6.2	201	17.2
	85/15	6.8	210	16.6
	80/20	7.4	219	16.2
	75/25	8.0	228	15.7
Molybdenum Copper MC	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 WHA	W/Ni/Cu (Wt %) 95/3.5/1.5	5.2	75	18.2
Other Common Materials in Industry				
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
	Ge	5.9	58	5.3
Ceramics	AlN	4.6	160-200	3.3
	Al_2O_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

Typical properties are believed to be accurate and reliable, but are presented without guarantee or warranty.