

Thin-Flat Submounts/Spacers for Semiconductor Thermal Management

Target Applications: High Power Laser Diodes and RF Circuits

Spectra-Mat has developed a high temperature sinter and infiltrate process for the manufacture of low expansion composite (LEC) materials. Our sinter and infiltrate process allows SMI's thin tungsten/copper submounts to achieve extremely flat surface conditions. We use only high purity raw materials. There are no lubricants or sintering aides added during processing. The result is a submount with excellent dimensional stability and thermal uniformity.

Spectra-Mat's Unique Process Offers the Following Advantages:

- Exceptional flatness and dimensional tolerance control
- Superior thermal conductivity compared to competitive products
- Excellent dimensional stability unaffected by high temperature cycling
- Ability to vary metal matrix density to achieve optimum combination of CTE and TC
- Metallization capability includes electrolytic, electroless, and thin film processes to meet your specifications

These characteristics make SMI's LEC material ideally suited where there is intimate contact between the semiconductor and a submount.



Typical Material Properties				
Compositions* (weight %)	90W/10Cu WC10	85W/15Cu WC15	80W/20Cu WC20	85Mo/15Cu MC15
Thermal Expansion (CTE) ($\times 10^6/K$) 25°C - 400°C	6.2	6.8	7.4	6.9
Thermal Conductivity (TC) (W/m•K) @ 25°C	201	210	219	154
Density (g/cm ³)	17.2	16.6	16.2	10.0
EC (% IACS)	73.3 > 33%	73.6 > 36%	73.8 > 38%	>30%

Manufacturing Capabilities		
Polished Surface Finish	Mirror	< 0.03 micron Ra
	Matte	0.4 - 0.5 micron Ra
Dimensional	Surface Flatness	10 micron / 10mm
	Thickness	125 micron to 25mm
	Max Dimension	250mm
	Edge Radius	< 15 micron
Metallization	Electroplated	Ni, Ni/Au, Ni/Cu, Cu, Ni/Ag
	Physical Vapor Deposition	Au, Ni, Pt, Ti, AuSn

[†]Best case for amenable designs

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

For additional information, applications or pricing, please contact:

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