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

PRODUCT BULLETIN

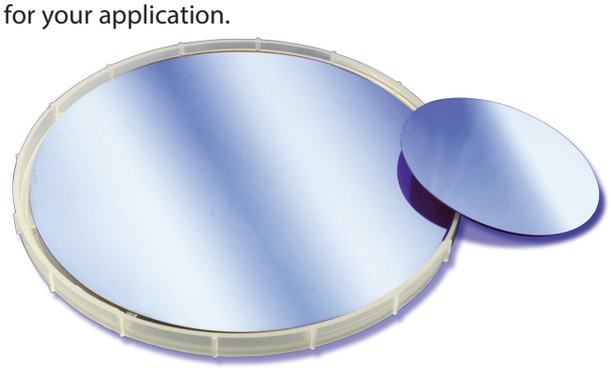
Low Expansion Substrates

Target Applications: High Brightness LED and CPV

Spectra-Mat now offers tungsten-copper substrates up to 150 mm diameter. Substrates can be supplied bare or metallized to allow direct solder attach of other substrates or semiconductor wafer materials. All substrates are high temperature annealed to maintain flatness during subsequent temperature processing by the end user.

The Advantage

Significant cost savings can be realized for products that require an expansion-matched heat sink. Expansion-matching can benefit devices dissipating greater than 50 W/cm^2 over a large area (greater than several mm^2). This includes high brightness LEDs, concentrated photovoltaic cells (CPV), high power RF devices, high power laser diodes, and certain other optoelectronic devices. Where discrete expansion-matched heat spreaders or sub-mounts have been used, integrating this function at the wafer level reduces unit costs and end user processing. Our engineering team will be pleased to assist you in choosing appropriate metallizing and bonding technology for your application.



Typical Material Properties				
Compositions (W/Cu weight %)	90/10 WC10	85/15 WC15	80/20 WC20	75/25 WC25
Thermal Expansion ($x10^6$/K) 25°C - 400°C	6.2	6.8	7.4	8.0
Thermal Conductivity (W/m•K) @ 25°C	201	210	219	228
Density	17.2	16.6	16.2	15.7

Manufacturing Capabilities†		
Surface Finish		
	Mirror	0.05 micron R
	Matte	0.50 micron R
Dimensional		
	Wafer Diameters	25, 50, 76.2, 100, 125, 150 mm
	Min. thickness	200 micron
	Flatness	<40 micron
	Max TTV	5 micron
Metallization*		
	Electrolytic	Ni, Ni/Au, Ni/Cu
	Electroless	Ni, Ni/Au
	Physical Vapor Deposition	Pt, Ti, Au, Au/Sn

†Best case for amenable designs
* Other coatings are available upon request

SMI also offers molybdenum/copper composites for weight sensitive applications and pure W substrates for lower CTE matching.

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

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