

Thermal Clad Insulated Metal Substrate (IMS®) was developed by Bergquist as a thermal management solution for today's higher watt-density surface mount applications where heat issues are a major concern.

Thermal Clad is a cost-effective solution which can eliminate components, allow for simplified designs, smaller devices and an overall less complicated production processes. Additional benefits of Thermal Clad include lower operating temperatures, longer component life and increased durability.

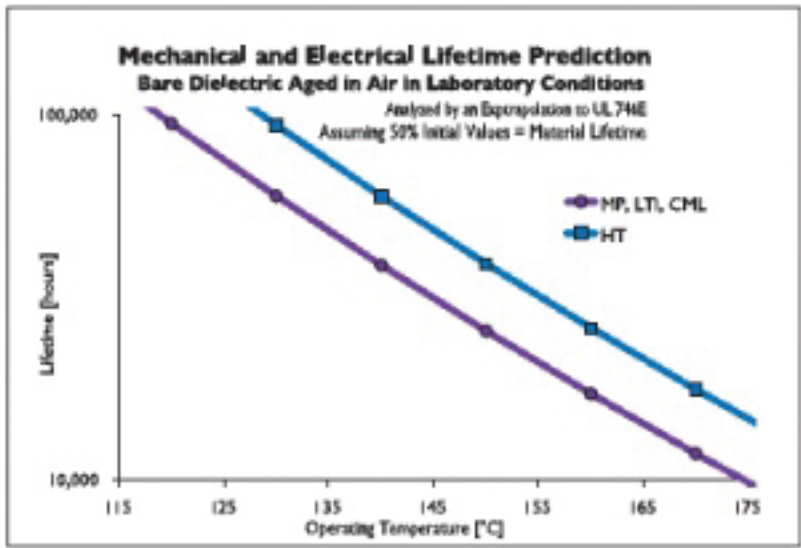
Bergquist Thermal Clad substrates are not limited to use with metal base layers. In one example, power conversion applications can enhance their performance by replacing FR-4 with Thermal Clad dielectrics in multi-layer assemblies. In this application, the thickness of the copper circuit layer can be minimized by the high thermal performance of Thermal Clad.

Thermal Clad is a complete thermal management system, unlike traditional technology which uses heat sinks, clips and other mounting hardware. Thermal Clad enables low-cost production by eliminating the need for costly manual assembly

SINGLE LAYER		THERMAL PERFORMANCE			DIELECTRIC PERFORMANCE		OTHER		
Part Number	Thickness ¹ [000"/µm]	Impedance ² [°C/W]	Impedance ³ [°C in ² /W] / [°C cm ² /W]	Conductivity ⁴ [W/m-K]	Breakdown ⁵ [kVAC]	Permittivity ⁶ [Dielectric Constant]	Glass Transition ⁷ [°C]	U.L. Index ⁸ [°C]	Peel Strength ⁹ [lb/in] / [N/mm]
HT-04503	3/76	0.45	0.05 / 0.32	2.2	6.0	7	150	140/140	6 / 1.1
HT-07006	6/152	0.70	0.11 / 0.71	2.2	11.0	7	150	140/140	6 / 1.1
MP-06503	3/76	0.65	0.09 / 0.58	1.3	8.5	6	90	130/140	9 / 1.6
MULTI-LAYER									
HT-09009	9/229	0.90	0.16 / 1.03	2.2	20.0	7	150	150/150	6 / 1.1
HT-07006	6/152	0.70	0.11 / 0.71	2.2	11.0	7	150	140/140	6 / 1.1
CML-11006*	6/152	1.10	0.21 / 1.35	1.1	10.0	7	90	130/130	10 / 1.8
HIGH POWER LIGHTING									
HPL-03015	1.5/38	0.30	0.02 / 0.13	3.0	2.5	6	185	**	5 / 0.9

Method Description: 1 - Optical; 2 - Internal TO-220 test RD 2018; 3 - Calculation from ASTM 5470; 4 - Extended ASTM 5470; 5 - ASTM D149; 6 - ASTM D150; 7 - Internal MDSC test RD 2014; 8 - U.L. 746 E; 9 - ASTM D2861. *CML is available in prepreg form; **Pending

Note: For applications with an expected voltage over 480 Volts AC, Bergquist recommends a dielectric thickness greater than 0.003" (76µm).
 Note: Maximum test voltage is a function of material and circuit design. Typical proof test does not represent the maximum.
 Note: Circuit design is the most important consideration for determining safety agency compliance.



MATERIAL	UL RTI - ELECTRO / MECHANICAL
HT	140°C / 140°C
LTI	130°C / 130°C
MP	130°C / 140°C
CML	130°C / 130°C

Choose the dielectric that best suits your operating temperature environment. For high temperature applications, such as automotive, HT offers 1 solution. All of our dielectrics are UL recognized.