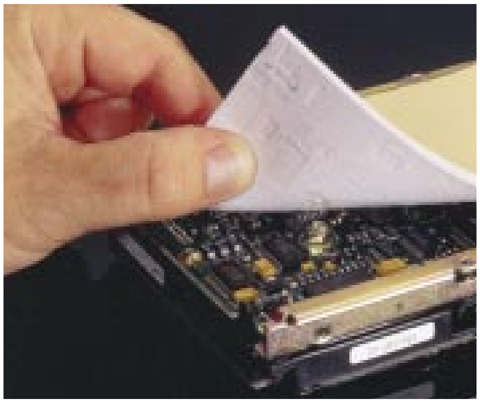
GAP PAD VO™

Conformable, Thermally Conductive Material for Filling Air Gaps



Gap Pad V0 is a thermally conductive material that acts as a thermal interface between a heat sink and an electronic device. The conformable nature of Gap Pad V0 allows the pad to fill in air gaps between PC boards and heat sinks or a metal chassis.

Gap Pad V0 is a highly conformable, low modulus polymer on a fiberglass carrier. The material is available in thicknesses from .020" to .160" with a liner applied to the pink side of the material. The range in thicknesses and the materials flexibility allow Gap Pad V0 to be used in a variety of applications where surface textures vary and the space between surfaces is uneven. The material is available in die-cut parts and with or without adhesive.

Applications

- Areas where heat needs to be transferred to the frame or other type of heat spreader
- Between a CPU and a heat spreader
- Between a semiconductor and heat sink
- Replacement for messy grease

U.L. File Number E59150

Die-Cut parts, and Sheets

Gap Pad is available in die-cut parts and sheets. Standard sheet size is 8" x 16". Gap Pad is not available in rolls.

Property	Value	Value	Test Method
Mechanical Properties			
Thickness inches	.020" to .160"		ASTM D374
Color	Yellow/Pink		Visual
Specific Gravity	1.6		ASTM D792
Heat Capacity J/g-K	1		ASTM C351
Continuous Use	-60 to +200C		
Hardness, entire composite	vs. Thickness (in)	(Type 00)	ASTM D2240
	0.020	80	
	0.040	65	
	0.060	65	
	0.080	55	
	0.100	50	
	0.125	45	
	0.160	40	
Young's Modulus (psi)	Rate	Modulus	ASTM D575
vs. Rate of Strain	0.01	200	
(inches/minute)*	0.1	300	
Area = 0.5 in^2	1.0	400	
Low Modulus Portion Only	10.0	800	

Stress vs. strain and resultant deflection in mils for each Gap Pad V0 thickness.
Example: Rate = 1 in/min. Modulus = stress/strain = 400 psi, Area = 0.5 in^2, Low Modulus Portion Only;

Stress	Strain	20 mil	40 mil	60 mil	80 mil	100 mil	125 mil	160 mil	
4 psi	1%	0.15	0.35	0.55	0.71	0.91	1.16	1.51	ASTM D575
8 psi	2%	0.30	0.70	1.10	1.42	1.82	2.32	3.02	
20 psi	5%	0.75	1.75	2.75	3.55	4.55	5.80	7.55	
40 psi	10%	1.50	3.50	5.50	7.10	9.10	11.6	15.1	
80 psi	20%	3.00	7.00	11.0	14.2	18.2	23.2	30.2	
200 psi	50%	7.50	17.5	27.5	35.5	45.5	58.0	75.5	

Property	Value	Value	Test Method
Electrical Properties			
Dielectric Constant	5.5		ASTM D150
Dielectric Breakdown Voltage kV-AC	>6		ASTM D149
Volume Resistivity, Ohm-meters	10^{11}		ASTM D257
Thermal Properties			
Thermal Conductivity @ 10 psi, W/m-K	0.8		ASTM D5470
Thermal Resistance** vs.	Thickness (in.)	(C-in^2/W)	
Entire composite	0.020	1.0	ASTM D5470
	0.040	2.0	
	0.060	3.0	
	0.080	4.0	
	0.100	5.0	
	0.125	6.2	
	0.160	8.0	

MODULUS * The modulus of Gap Pad is shown as being rate dependent because Gap Pad is viscoelastic. At high rates of compression Gap Pad is elastic and at low rates it is viscous. Elastic strain is instantaneous, independent of time. The total deformation occurs at the instant the stress is applied and is completely recovered when the stress is released. Viscous strain is time dependent. The deformation is not instantaneous but occurs over time and is not completely recovered after the stress is removed. As an example, if the low modulus Gap Pad rubber is molded into a ball and dropped on the floor it will bounce. However, if a load is placed on the ball for a long period of time it will flatten out to a certain extent and will not recover completely to it's original shape after the load has been removed.

THERMAL RESISTANCE ** With Gap Pad, the thermal resistance is dependent on the gap between the device and the heatsink. The engineer can minimize the thermal resistance by designing the gap as small as possible. A Gap Pad thickness is then chosen to be just thick enough to fill the largest gaps while minimizing the deflection needed in the smallest gaps to decrease the stress exerted on the devices. If the size of the gaps are known, the thermal resistance across each gap is determined from the table of thermal resistance vs. thickness.