

## Thermal Gap Pad

Thermal Gap Pad is design to be used in the applications that require the minimum amount of pressure on components and high thermal conductivity. Brothers Thermal gap pad is very conformable, filled silicone rubber material and has 1-8W/mK based on hot disk thermal conductivity grades. It is easy to fill in air gaps between PC board and heat sinks or a metal chassis.

Our unique silicone chemistry ensures high compliance to surface irregularity and good surface wetting property, thus offering very low Thermal Contact Resistance at Thermal Joint, and very efficient heat transfer between hot spots and heat sink.

Our Thermal Gap Pad is highly tacky to most surfaces, so no PSA is required. Optionally, we offer one side non tacky to facilitate application that requires the easy removal of hot side component.

## Product Features

- Optional Single or 2 Sides Tacky
- RoHS Compliant
- Customized color and size
- Optional Glass fiber reinforcement
- Available in ultra soft pad to achieve over 50% deflection under low stress

## Typical Applications

- Heat Sink / Chassis
- Memory Modules
- Server and Network Equipment
- Large Storage Device
- Automotive Electronics
- Communication Equipment
- Power Supplies
- LCD Display

## Technical Specification

Performance		EETGP100	EETGP200	EETGP250	TGP300	TGP300S	TGP300C	TGP 400	TGP500	TGP700	TGP800	Test Method	
Physical	Density (g/cc)	2.2	2.5	2.6	3.1	3.0	2.7	3.1	3.1	3.2	3.1	ASTM D792	
	Thickness (mm)	0.25-5.0				0.5-5.0	0.25-5.0			0.5-5.0			ASTM D374
	Hardness (shore 00)	40				10	40					ASTM D2240	
Thermal	Thermal Conductivity (W/m.k)	1.0	1.5	2.0	2.5	3.0	3.0	4.0	5.0	7.0	7.5	Hot Disk	
		1.2	1.7	2.3	2.8	3.4	3.4	4.6	5.6	7.5	8.0	ASTM D5470	
	Operation Temp(°C)	-55-200										/	
Electronic	Breakdown Voltage (v/mm)	8000					1000	8000			1500	ASTM D149	
	Volume Resistance (Ohm-cm)	>10 <sup>13</sup>										ASTM D257	
	Dielectric Constant @1MHz	5.8	5.8	6.0	6.0	3.8	16.3	4.2	7.9	9.8	12.8	ASTM D150	
Regulatory	Flamming Rate	V-0										UL94	
	RoHS	Compliant										/	
	Shelf Life(Month)	12										/	



## Thermal Gel

Thermal Gel is a soft, single part, silicone putty thermal gap filler in which no cure is required. This gap filler is designed to be used in where large gap tolerances are present and low mechanical stress on delicate components are needed. It is ideal for filling variable gaps between multiple components and a common heat sink.

Thermal Gel has a composition which yields superior thermal performance and super compliancy. This material transfers little to no pressure between interfaces. Specialized rheology allows for easy flow under pressure.



## Product Features

- Soft and compliant transferring little to no pressure between interfaces
- TG 200,350 & TG 300 offer high thermal conductivity with standard dielectric performance
- TG300C offer cost-effective solution and better dispensing speed which applied in non-strict dielectric requirements
- Easily dispensable
- Fully-cured
- Low thermal resistance

## Typical Applications

- Heat Sink / Chassis
- Memory Modules
- Server and Network Equipment
- Large Storage Device
- Automotive Electronics
- Communication Equipment
- Power Supplies
- LCD Display

## Technical Specification

Performance		Thermal Gel			Test Method
		TG200	TG300	TG350	
Physical	Color	White	Grey	Green	Visual
	Density (g/cc)	2.3	2.78	2.9	ASTM D792
	Flow Rate (g/min)	25	18	25	2.0mm Needle @ 90Psi
	Hardness (shore 00)	10			ASTM D2240
	Bondline Thickness (mm)	0.1			
Thermal	Thermal Conductivity (W/m.k)	2.0	3.0	3.5	ASTM D5470
	Operation Temp. (°C)	-55~200			/
Electric	Breakdown Voltage (KV/mm)	>5			ASTM D149
	Volume Resistance(ohm-cm)	>10 <sup>13</sup>			ASTM D257
Regulatory	Flammability Rate	V0			UL94
	RoHS	Compliant			/
	Shelf Life(months)	24			/



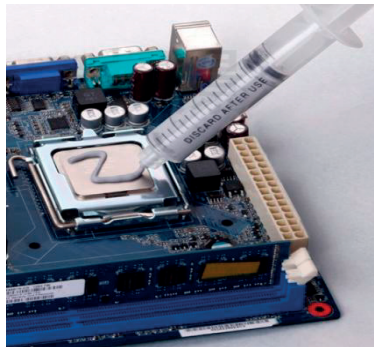


### Thermal Grease

Thermal Grease is used in high performance CPU's and GPU's. With a high thermal conductivity of 1.5-4W/mK, TG series thermal grease thoroughly wets out thermal surfaces to create very low thermal resistance.

Thermal grease eliminated the migration issues of silicone based grease to create superior reliability. TG series is ideal for situations where automatic dispensing and screen-printing are required.

TG series is non-toxic and environmentally safe. TG series is available in 2kg(1L container), 8kg (1 gallon) and 20 kg (5 gallon) or custom package in syringes for automated applications.



### Product Features

- TGR300, 400 offers a high thermal conductivity of 3.0-3,8W/mK while achieving thin bonding line thickness of 0.03mm.
- TGR100 is coat effective product with 1.5W/mK thermal conductivity
- TGR400SF offers silicone-free base, ideal for silicone sensitive application.

### Typical Applications

- HCPUs (Notebooks, Desktops, Servers)
- LED Solid State Lighting
- GPUs
- Northbridge Chipsets
- ASICS Chips

### Technical Specification

Performance	TGR100	TGR300	TGR310	TGR400	TGR400SF	TEST METHOD
Color	White	Gey				Visual
Based Material	Silicone				Silicone-free	
Viscosity(cps)	<250,000	<150,000	50,000~150,000	<150,000	<250,000	Brookfield Viscometer
Density (g/cc)	2.47	2.7	2.6	2.73	2.57	ASTM D792
Flamming Rate	V-0	V-0	V-0	V-0	V-0	UL 94
Operation Temp.(°C)	-40~150	-40~150	-40~150	-40~150	-40~150	—
<b>Thermal</b>						
Thermal Conductivity (W/m-K)	1.5	3.1	3.0	3.8	4.0	ASTM D5470
Thermal Resistance (in <sup>2</sup> °C/W)@50psi	0.045	0.024	0.025	0.022	0.021	ASTM D5470
	0.025	0.020	0.021	0.018	0.017	
<b>Shelf Life</b>						
Shelf Life@ 25°C	12 month	12 month	6 month	6 month	6 month	—

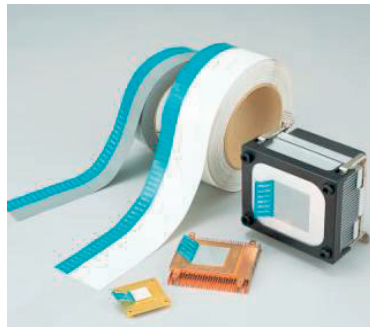


## Thermal PCM

Phase change material is designed to maximize heat sink performance and improve component reliability. Thermal Phase Change Material completely fills interfacial air gaps and voids. It also displaces entrapped air between power dissipating electronic components.

At room temperature, TPCM400 material is solid and easy to handle. This allows it to be consistently and cleanly applied as dry pad to a heat sink or component surface. Upon reaching its melting temperature of 52 °C, TPCM400 begins to soften and flow, filling the microscopic irregularities of the component it comes into contact with. The result is an interface with minimal bond-line thickness and thermal contact resistance

TPCM400 can be supplied as sheets, rolls and custom die-cut configurations.



## Product Features

- Low thermal resistance ( 0.015°C-in<sup>2</sup>/W @ 50 psi)
- High reliability
- Inherently tacky and no adhesive required
- RoHS compliant

## Typical Applications

- CPUs (Notebooks, Desktops, Servers)
- Chipsets
- GPU
- ASICS Chips

## Technical Specification

Performance	TPCM400	Test Method
Structure	Non-reinforced film	
Color	灰色	Visual
Phase Change Temp (°C)	52 (option)	ASTM D3418
Thickness (mm)	0.10-0.25	ASTM D374
Density (g/cc)	2.93	ASTM D792
Flamming Rate	V-0	
Operation Temp (°C)	-40~125	
<b>Thermal</b>		
Thermal Conductivity (W/m-K)	4.0	ASTM D5470
Thermal Resistance (°C-in <sup>2</sup> /W)*		
@ 10 psi (69 KPa)	0.03	ASTM D5470
@ 50 psi (345 KPa)	0.015	
<b>Electric</b>		
Volume Resistance (Ohm-cm)	2*10 <sup>12</sup>	ASTM D257

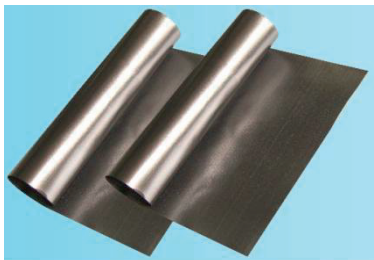


## Synthetic Graphite

Synthetic graphite materials are a thermal spreader sheet with high thermal conductivity and high flexibility. It is manufactured entirely from pyrolytic graphite with no fillers or binders and is ideal for providing thermal interface between power devices and heat-sinking in limited spaces.

It possesses unique functions such as eliminating hot spots, shielding components and reducing skin temperature of electronic devices. It is an ideal thermal management material in limited space.

It is available to be supplied in sheet, roll or die cut into customizable shapes and can be laminated with PSA, foam, film or other multi-layer structures.



## Product Features

- Anisotropic and over all high thermal conductivity
- High thermal stability
- Lightweight
- Flexible and conformable
- RoHS compliant

## Typical Applications

- Smart Phone
- Note book
- Tablet
- Other consumer electronics

## Technical Specification

Performance	SG17	SG25	SG40	Test Method
Color	Dark Grey			Visual
Thickness (mm)	0.017	0.025	0.04	ASTM D374
Tolerance (mm)	0.003	0.003	0.003	
Density (g/cm <sup>3</sup> )	2.0	1.8	1.8	ASTM D2638 Modified
Flamming Rate	V0	V0	V0	UL94
Operation Temp. (°C)	-100 ~ 450			
Thermal				
Thermal Conductivity In-pane (W/m.k)	1500-1800	1300-1600	1000-1300	STMD5470
Thermal Conductivity Vertical(W/m.k)	15	15	15	Angstrom Method
Electric				
Electrical Conductivity (S/m)	2*10 <sup>6</sup>	2*10 <sup>6</sup>	2*10 <sup>6</sup>	ASTM C611
Mechanical				
Repeat Bending 180° , R5 (cycle)	10000	10000	10000	



### Thermal Isolation Material

THIM is a new thermal isolation material by adding aerogel into ceramic based to achieve excellent low thermal conductivity and with high operation temperature range. Aerogel has nano-structure which limited thermal transtion, which lead to very low thermal conductivity. Its thermal conductivity is as low as 0.025W/mK, which is 2 to 3 orders less than other solid material. Material also has good inflaming with UL 94V0



### Product Features

- Very low thermal conductivity
- High operation temperature
- Available in sheet and roll
- Easy to die-cut
- Available in PSA on one side

### Typical Applications

- Electronic device
- Vacuum device
- Aviation
- Aerocraf

### Technical Specification

Performance	THIM75	THIM150	THIM300	THIM450	Test Method
Thickness (mm)	0.075±0.01	0.15±0.01	0.3±0.01	0.45±0.01	ASTM D374
Density (g/cm <sup>3</sup> )	0.24	0.24	0.24	0.24	ASTM D792
Thermal Conductivity (W/mK)	≤0.025	≤0.025	≤0.025	≤0.025	ASTM E1461
Operation Temp.(°C)	-260~400	-260~400	-260~400	-260~400	EN344

