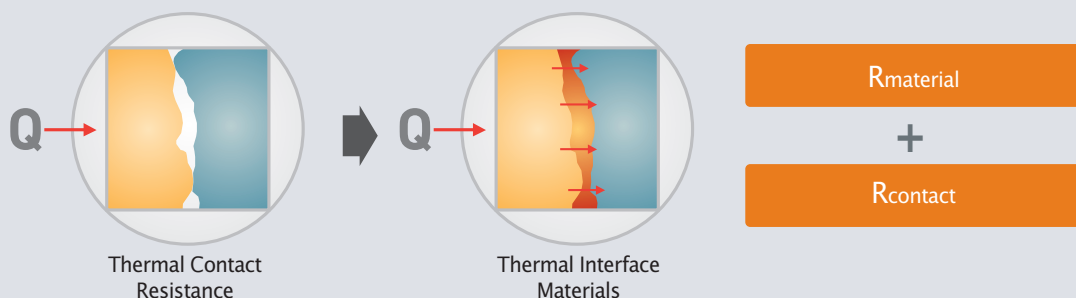
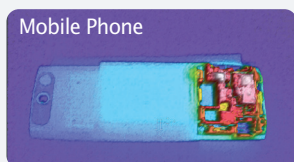


PRINCIPLE

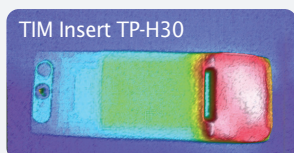
(Q : Heat Flow)



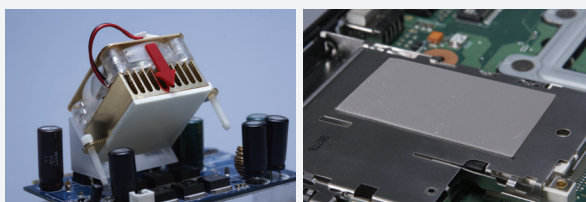
EXAMPLE



Max. Temp. 50°C

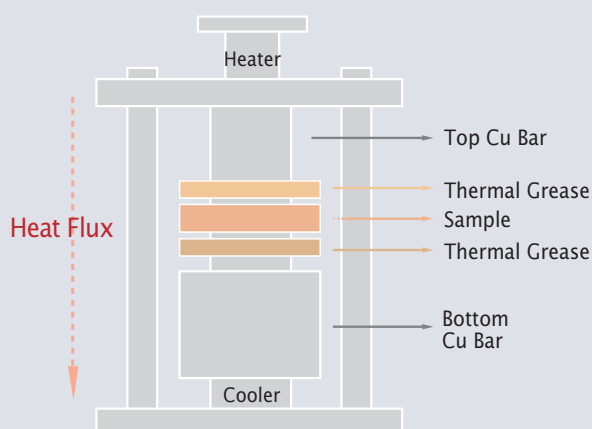


Max. Temp. 43°C

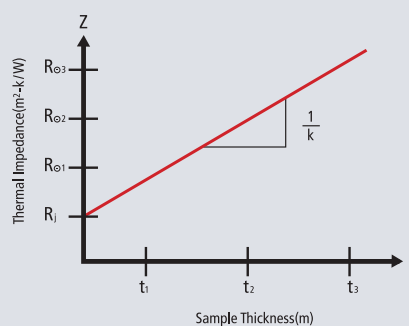


- + Computers
- + Mobile Phones
- + FPD Devices (PDP, LCD, LED..)
- + Digital Cameras / Camcorders
- + DVD / Audio equipment
- + Home appliances
- + Communication Devices
- + Magnetic Power Devices
- + Automobiles

METHOD OF MEASURING THERMAL CONDUCTIVITY [ASTM D5470]



Heat Flow Method



$$Z_{\theta} = \frac{t}{k \cdot A} + R_j$$

k : Thermal conductivity
 t : Sample thickness
 A : Sample area
 R_j : Contact thermal resistance

Thermal Impedance



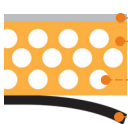
THERMAL CONDUCTIVE MATERIALS

THERMAL CONDUCTIVE MATERIALS

The TP Series is a product line of heat dissipation sheets that quickly and efficiently transfers heat from its source to a low temperature area.

SOFT TYPE

TP-S is a heat dissipation sheet with self-adhesion and a low level of hardness.



Cover Film
Silicone Polymer
Ceramic Powder
Release Film

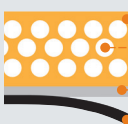
FEATURES

- + Self-adhesion
- + Excellent adhesion characteristics
- + Low Siloxane
- + Excellent Incombustibility

Test Items	TP-S10	TP-S15	TP-S20	TP-S25	TP-S30	TP-S50
Thermal Conductivity (W/mK)	1	1.5	2	2.5	3	5
Color	Black	Grey/Blue	Grey	Purple	Grey	Brown
Standard Thickness (mm)	0.5 ~ 5.0					
Standard Size (mm x mm)	210x297, 300 x 300					
Hardness (Shore C/Shore 00)	25/55	25/55	25/55	25/55	25/55	30/65
Tensile Strength (MPa)	> 0.25	> 0.22	> 0.22	> 0.22	> 0.2	> 0.2
Use Temp.(°C)	-60°C ~ 200°C					
Breakdown Voltage (kV)	> 5	> 5	> 5	> 5	> 5	> 5
Volume Resistivity (Ω · cm)	> 10 ¹³					
Base Polymer	Silicone					
Flammability (UL94)	V-0					

HARD TYPE

TP-H is a heat dissipation sheet with excellent electrical insulating properties



Silicone Polymer
Ceramic Powder
Adhesive Layer
Release Film

FEATURES

- + High thermal conductivity
- + One side adhesion is possible
- + Excellent insulating properties
- + Low Siloxane

Test Items	TP-1	TP-2	TP-3
Thermal Conductivity (W/mK)	1.0	2.0	3.0
Color	Blue	Red	Yellow
Standard Thickness (mm)	0.3 ~ 5.0	0.3 ~ 5.0	0.3 ~ 5.0
Standard Size (mm x mm)	210x297, Roll (210 x 15M)		
Hardness (Shore A)	40	55	30
Tensile Strength (MPa)	> 3.7	> 2.6	> 1.5
Use Temp.(°C)	-60°C ~ 200°C		
Breakdown Voltage (kV)	> 5		
Volume Resistivity (Ω · cm)	> 10 ¹³		
Base Polymer	Silicone		
Flammability (UL94)	V-0	V-0	V-0

SUPER SOFT TYPE

TP-SS is a heat dissipation sheet with excellent self-adhesion properties and an ultra low level of hardness.



TP-SS

FEATURES

- + Self-adhesion
- + Low Siloxane
- + Excellent Incombustibility

Test Items	TP-SS10	TP-SS15	TP-SS20	TP-SS25	TP-SS30
Thermal Conductivity (W/mK)	1	1.5	2	2.5	3
Color	Black	Blue	Grey	Purple	Grey
Standard Thickness (mm)	0.5 ~ 5.0				
Standard Size (mm x mm)	210x297, 300 x 300				
Hardness (Shore 00)	40	40	40	40	40
Tensile Strength (MPa)	> 0.1	> 0.1	> 0.1	> 0.1	> 0.1
Use Temp.(°C)	-60°C ~ 200°C				
Breakdown Voltage (kV)	> 5				
Volume Resistivity (Ω · cm)	> 10 ¹³				
Flammability (UL94)	V-0				

HIGH TENSILE STRENGTH TYPE

TP-SG/HG is a fiberglass reinforced sheet that can be used for an area requiring high tensile strength.

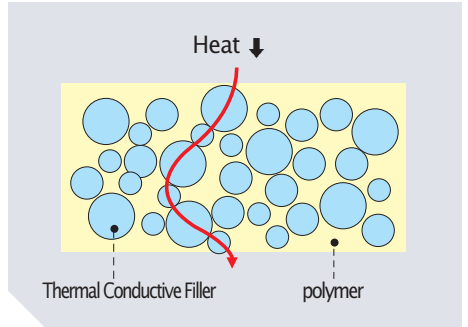
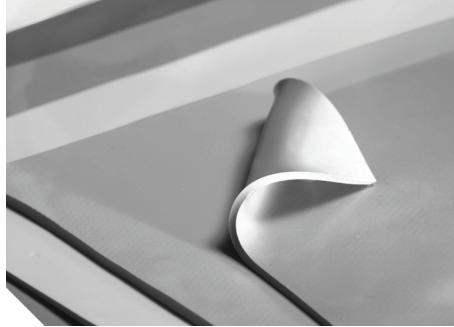


Silicone Polymer
Ceramic Powder
Glassfiber Mesh
Ceramic Powder
Release Film

FEATURES

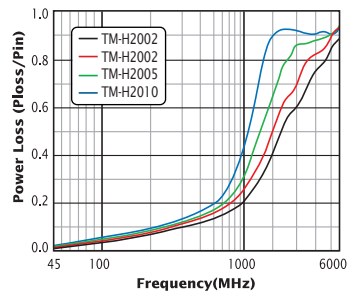
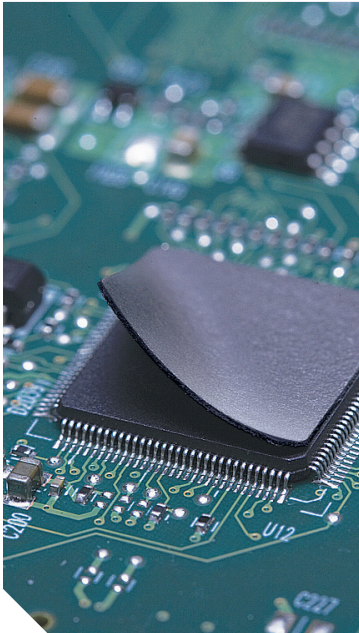
- + High thermal conductivity
- + Excellent insulation
- + High tensile strength
- + Excellent

Test Items	TP-HG15	TP-SG30
Thermal Conductivity (W/mK)	1.5	3.0
Color	Pink	Gray
Standard Thickness (mm)	0.3 ~ 1.0	0.3 ~ 1.0
Standard Size (mm x mm)	300 x 300, Roll(210x15M)	210 x 297
Hardness (Shore C)	70 ~ 90	60 ~ 70
Tensile Strength (MPa)	> 9.0	> 4.0
Use Temp.(°C)	-60°C ~ 200°C	
Breakdown Voltage (kV)	> 5	
Volume Resistivity (Ω · cm)	> 10 ¹³	
Base Polymer	Silicone	
Flammability (UL94)	V-0	V-0



DUAL SHEET THERMAL & ABSORBER

The Dual Sheet is a multi functional sheet performing both a heat dissipation and EMI absorbing function.



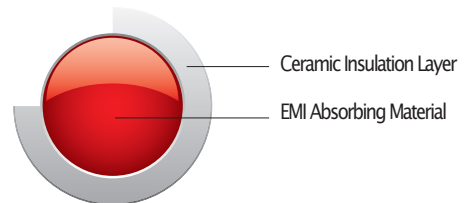
SPECIFICATIONS

Test Items	TM-S15	TM-S20	TM-H20
Thermal Conductivity (W/mK)	1.5	2.0	2.0
Color	Black		
Standard Thickness (mm)	0.5 ~ 5.0		0.2 ~ 1.0
Standard Size (mm x mm)	210 x 297, 300 x 300	210 x 297	
Hardness (Shore A)	25 (Asker C)		94 (Shore A)
Tensile Strength (MPa)	> 0.17		> 3.00
Use Temp.	-60 ~ 200		-40 ~ 130
Volume Resistivity ($\Omega \cdot \text{cm}$)	> 10^{11}		> 10^9
Base Polymer	Silicone		Acryl rubber
Flammability (UL94)	V-0		V-0

FEATURES

- + High thermal conductivity
- + High conformability
- + Low siloxane content or siloxane free
- + Multi - Functions
- + High tensile strength
- + Certification of UL94V-0
- + Eco - Friendly

FUNCTIONAL FILLER



THERMAL GREASE

TG-3 is an outstanding product for thermal conductive grease.

FEATURES

- + High thermal conductivity
- + Easily re-workable
- + Short hardening time
- + Outstanding long time reliability

SPECIFICATIONS

TEST		TG-3
Viscosity (cps)	2 rpm	491,000
	20 rpm	88,500
Tixotropic Index		5.55
Working Life @ 25°C (hrs.)		24
Specific Gravity (g/cc)		2.48
Curing Time (°C/min)		150/10
Volume Resistivity ($\Omega \cdot \text{cm}$)		10^{11}
Thermal Conductivity (W/mK)		3.20
Color		Gray
Shelf Life @ -10°C (months)		3