



GRAVIC GROUP

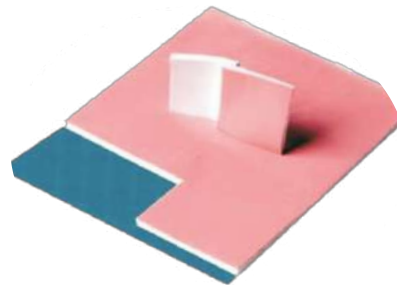
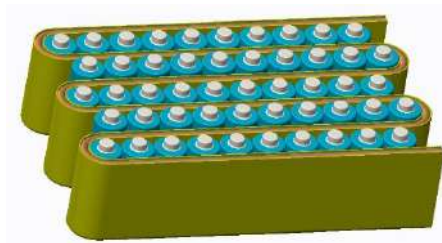
THERMAL MANAGEMENT AND
EMI SHIELDING SOLUTIONS

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THERMAL INTERFACE MATERIALS

Thermal management solutions ensure a long-term lifetime and functioning of electronic components in electronic circuits and batteries.

TIMs minimise the thermal gradient, thus reducing the thermal resistance between two contact surfaces.

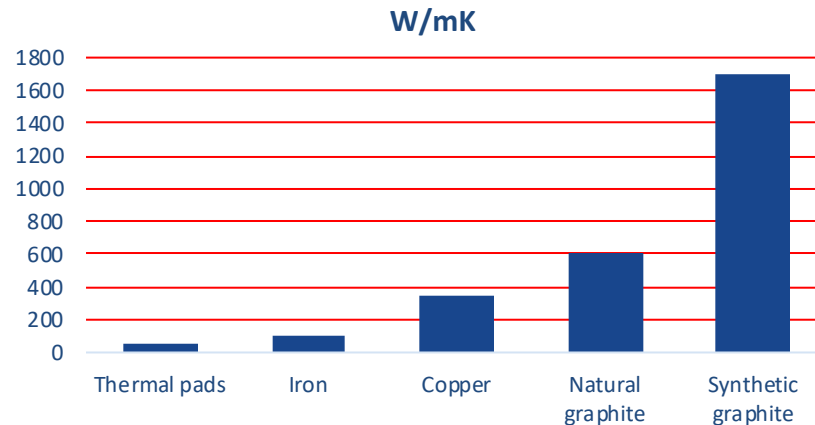
The thermal conductivity is the inner property of materials to conduct heat. The thermal resistance through the material itself is an internal resistance.

It depends on the following factors:

- material thickness
- thermal conductivity
- surface area

The thermal resistance of soft materials such as compliable elastomers and gap fillers are subjected to pressure.

Material thermal transmission comparative

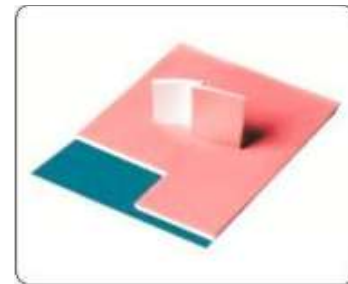


GRAVIC GROUP IS PROVIDING A COMPLETE RANGE OF THERMAL INTERFACE MATERIALS AND EMI SHIELDING MATCHING YOUR NEEDS (CONDUCTIVITY, THICKNESS, DESIGN, COLOR, HARDNESS...).

THERMAL PAD OVERVIEW

THERMAL CONDUCTIVITY	HARDNESS	COLOR
1.0 W/m.K	35 Shore 00	Pink
1.2 W/m.K	30 Shore 00	Light Grey
1.5 W/m.K	40 Shore 00	Light Blue
2.0 W/m.K	45 Shore 00	Orange
3.0 W/m.K	40 Shore 00	Blue
5.0 W/m.K	45 Shore 00	Violet
8.0 W/m.K	50 Shore 00	Grey
12.0 W/m.K	60 Shore 00	Ash Grey

* Thicknesses and others colors or conductivities available on demand.



SILICONE-FREE THERMAL PAD OVERVIEW

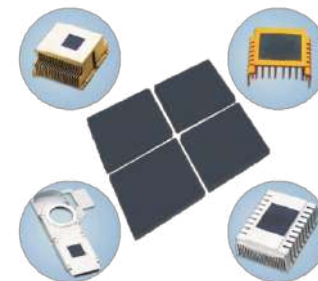
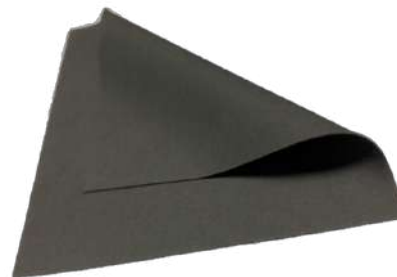
THERMAL CONDUCTIVITY	HARDNESS	COLOR
3.0 W/m.K	45 Shore 00	Light Grey
5.0 W/m.K	60 Shore 00	Dark Grey

* Thicknesses and others colors or conductivities available on demand.



PREMIUM THERMAL PAD OVERVIEW

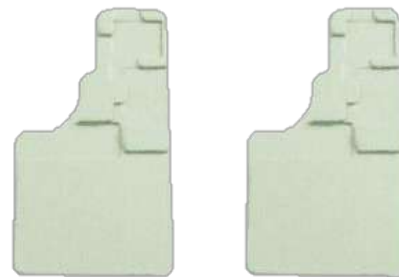
THERMAL CONDUCTIVITY	HARDNESS	COLOR
35 W/m.K	20 Shore A	Black
50 W/m.K	50 Shore A	Black
60 W/m.K	30 Shore A	Black



3D THERMAL PAD

THERMAL CONDUCTIVITY	HARDNESS	COLOR
From 1.0 to 6.0 W/m.K	From 30 to 60 Shore 00	Customized

- Minimum Thickness: 0.5mm
- Designed following customer drawings
- Perfectly match to the irregular gap space
- Easy to assemble



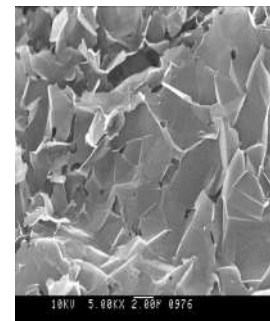
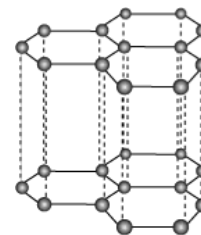
PHASE CHANGE MATERIAL (PCM) OVERVIEW

THERMAL CONDUCTIVITY	MELTING TEMPERATURE	COLOR
3.0 W/m.K	45 – 60 C	Light Grey
5.0 W/m.K	45 – 60 C	Black



NATURAL GRAPHITE

PLAIN THERMAL CONDUCTIVITY	Z-AXIS THERMAL CONDUCTIVITY	ELECTRICAL RESISTANCE – Z-AXIS
420.0 W/m.K	5.5 W/m.K	310 $\mu\Omega$ -m
600.0 W/m.K	7.0 W/m.K	360 $\mu\Omega$ -m



SYNTHETIC GRAPHITE

THERMAL CONDUCTIVITY	
	900 W/m.K
	1100 W/m.K
	1500 W/m.K
	1600 W/m.K
	1700 W/m.K



CONDUCTIVE DOUBLE SIDED ADHESIVES

MATERIAL	THERMAL CONDUCTIVITY	INSULATION RESISTANCE 500 VDC	PULLING FORCE	COLOR
POLYESTER 140 and 160 μm	0.14 W/m.K	250 G Ω	39N/cm ²	White
ALUMINIUM 150 μm	1.6 W/m.K	Not applicable	1.5kg/25mm	White
FIBERGLASS 150 μm	1.5 W/m.K	Not applicable	1.4g/inch	White

* Others adhesives available on demand.



EMI SHIELDING MATERIALS

EMC CONDUCTIVE FOAMS

SHIELDING EFFECTIVENESS (10 MHz – 3 GHz)	SURFACE RESISTANCE (Ω/in^2)	Z AXIS RESISTANCE (Ω)
≥ 80 dB	≤ 0.048	≤ 0.07
≥ 60 dB	≤ 0.5	≤ 0.2

* Thicknesses and others colors or conductivities available on demand.

CF040 (XYZ Conductive Foam)



CF010 (Fabric-Over-Foam)



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