THERMALLY CONDUCTIVE COMPOUNDS

CONDUCTIVE PRODUCT

FEATURES

- Consistent heat dissipation
- Lower weight than traditional heat sink materials
- Inherent corrosion resistance
- Thermal conductivity up to 35 W/(m·K)

BENEFITS

- Customizable thermal performance with a variety of additives
- Performs in a wide range of operating temperatures and environments
- Injection molding allows creative designs at a lower cost
- Molded in color eliminates costly secondary operations
- Part consolidation simplifies device assembly
- Available in a wide variety of thermoplastic resins
- Electrically insulative or conductive

For more information, view our thermally conductive data sheets at: web.rtpcompany.com/info/data/thermal/index.htm

Traditional metal heat sinks used in LED light bulbs are heavy, hard to work with, and limit design options. Our thermally conductive PA 6/6 compounds provide reduced weight, unlimited design creativity and freedom, color options, and electrical isolation.

Unlike traditional thermoplastic materials, which insulate heat, thermally conductive compounds from RTP Company transfer heat. Not only do these compounds provide thermal transfer similar to that of metals, but they also allow for part consolidation, which increases design freedom and requires a less costly single-step manufacturing process.

Our engineers compound thermally conductive additives into a wide variety of thermoplastic resins to produce compounds optimized for thermal management and for performance in a wide range of operating temperatures and environments. Our engineers can also assist in selecting the proper base resin, which can improve chemical resistance and eliminate corrosion that can lead to failure of metal heat sinks.

Especially significant in energy conscious transportation uses, these compounds offer significant weight reduction. Thermally conductive compounds from RTP Company are typically 50 percent lighter than comparable aluminum heat sinks.

For many designs, heat sinks that are processed via injection molding and made of thermally conductive compounds also offer greater design flexibility. This allows designers to maximize thermal transfer via convection, delivering better thermal performance while minimizing manufacturing costs.

While metals are often chosen for their high thermal conductivity, many applications do not require such level of thermal transfer via conduction. In fact, air movement (or convectional thermal transfer) more often determines how effectively a system dissipates heat. Thermally conductive compounds from RTP Company have proven successful when used as heat sinks in the following applications: LED luminaires and LED lighting fixtures, consumer electronic devices, aerospace and automotive cooling systems, motor and battery housings, temperature sensors, and heat exchangers.

LED luminaires	Aerospace cooling systems	Battery housings
LED lighting fixtures	Automotive cooling systems	Temperature sensors
Consumer electronic devices	Motor housings	Heat exchangers

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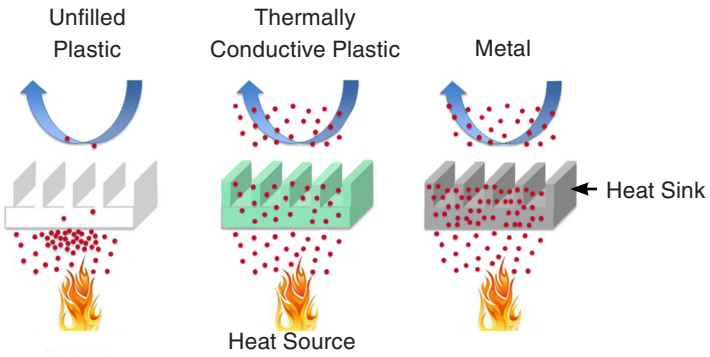
THERMALLY CONDUCTIVE COMPOUNDS

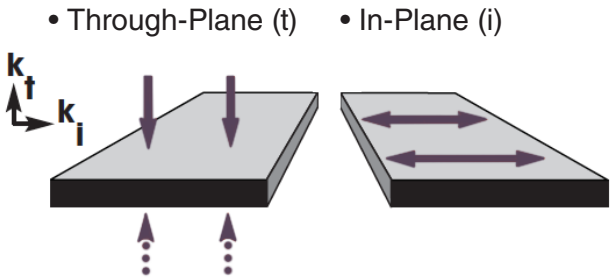
REPLACING METAL

Heat flow to the surrounding air is limited by the convection step; as such, metal materials with higher conductive properties often do not provide any extra benefit. Although an unfilled plastic is unable to keep up with the convection rate, a thermally conductive plastic compound can dissipate heat as effectively as a metal material, making it an excellent choice for metal replacement and light weighting.



ADDITIVE ORIENTATION

The thermal conductivity (k) of thermoplastic compounds can be orientation dependent when high aspect ratio additives (fibers, flakes, etc.) are used because they tend to align with polymer flow during molding. This orientation can result in non-isotropic thermal conductivity where values in-plane tend to be higher than through-plane.



COMPARATIVE PROPERTIES FOR COMMON COMPOUNDS*

Product	Color	Resin	Conductive or Insulative	Through-Plane (W/m-K)	In-Plane (W/m-K)	UL V-0
RTP 799 X 131030 C	Nat/Blk	HDPE	Conductive	1.2	5.0	No
RTP 399 X 137054	Nat/Blk	PC	Conductive	0.7	4.0	No
RTP 399 X 140986 C	Nat/Blk	PC	Conductive	1.4	13.0	Yes
RTP 0299 X 137087 K	Brown	PA66	Insulative	0.7	1.3	No
RTP 299 X 137092 D	White	PA66	Insulative	0.75	2.5	No
RTP 299 X 137151 B	White	PA66	Insulative	1.0	5.0	Yes
RTP 299 X 138958 B	Nat/Blk	PA66	Conductive	1.75	6.5	No
RTP 299 X 140984	Nat/Blk	PA66	Conductive	2.5	10.0	No
RTP 299 X 137077	Nat/Blk	PA66	Conductive	4.5	18.0	No
RTP 1399 X 140971 B	Tan	PPS	Insulative	1.0	2.5	Yes
RTP 1399 X 137162 E	Nat/Blk	PPS	Conductive	1.2	5.0	Yes
RTP 4099 X 137099 D	Nat/Blk	PPA	Conductive	1.2	6.0	No

**Custom compounds can be formulated to meet specific application requirements.*

RTP COMPANY: YOUR GLOBAL COMPOUNDER OF CUSTOM ENGINEERED THERMOPLASTICS