

Material Solutions for **LED Manufacturing**

The popularity of LEDs stems from their superior efficiency compared to incandescent bulbs, which translates into a lower operating cost and longer lifespan. It is important to invest in products that will help extend the lifespan of LEDs, especially in harsh environments where specialty coatings, resins and adhesives are needed to protect these delicate electronics from stresses such as mechanical impacts, precipitation, sunlight, and potential exposure to harsh chemicals.

MG Chemicals offer a full line of products suited for the LED industry, such as protective coatings, potting and encapsulating compounds, thermal interface materials (TIMs), structural and specialty adhesives.



LED Solutions

Lens

Many LED fixtures are used in outdoor applications and therefore require protection from environmental stresses. Precipitation, mechanical shocks, extreme temperatures, high humidity, and exposure to chemicals can all negatively impact LEDs causing corrosion, compromised light output, and structural failure.



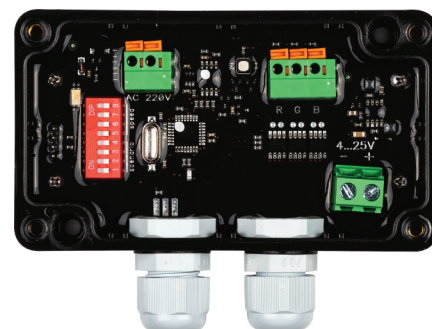
Heat Sinks

The overall lifespan of an LED depends heavily on how effectively it can dissipate heat. Specifically, it is essential that the heat generated from the diode is effectively channeled to the heat sink, preventing overheating and subsequent failure.



Drivers

The LED driver is an electrical circuit used to power a light-emitting diode. These drivers generate a large amount of heat which, if not removed, causes the driver to fail.



Conformal Coatings

Conformal coatings are thin, clear coats that provide protection from the external environmental factors, namely moisture ingress, fungal decay and erosion from airborne dust and other foreign particles.

Product	Chemistry	Color	Temperature Range	Application
422B	Acrylic/Silicone	Clear	-40 °C to 200 °C (-40 °F to 392 °F)	Protective coating for LED domes
419D	Acrylic	Clear	-65 °C to 125 °C (-85 °F to 257 °F)	Protective coating for LED domes
4226A	Alkyd	Clear	-30 °C to 180 °C (-22 °F to 356 °F)	Protective coating for PCBs

Potting Compounds

Potting resins offer the same protections as conformal coatings plus, protect components from external shock and vibration. Thermally conductive resins also help conduit heat away from components, preventing overheating.

Product	Chemistry	Color	Temperature Range	Application
832WC	Epoxy	Clear	-40 to 140 °C (-40 to 284 °F)	Optically clear encapsulant, shock protection for LED domes. Submersible in water.
832TC	Epoxy	Black	-30 to 175 °C (-22 to 347 °F)	Thermally conductive epoxy for potting drivers and LED strips.
834HTC	Epoxy	Black	-50 to 150 °C (-58 to 302 °F)	Thermally conductive, flame retardant epoxy for potting drivers and LED strips.
832FX	Epoxy	Black	-40 to 140 °C (-40 to 284 °F)	Flexible potting protection for LED drivers.

Adhesives

Adhesives are an easy way to fabricate and bond structures. MG offers a wide range of adhesives with secondary functions, such as thermal conductivity (for heat dissipation between LED boards and heatsinks), electrical conductivity (LED die attachment for high assembly throughput via automated processes) and structural adhesives (bonding LED assemblies and fixtures).

Product	Chemistry	Color	Working Time	Application
8329TFF	Epoxy	Off-white	5 minutes	Heat dissipation between LED boards and heatsinks
1035	Silicone	Clear	15 minutes	Flexible sealant and strain relief for cables
8332	Epoxy	Clear	5 minutes	Sealant and strain relief for cables
9410	Epoxy	Silver	Not Applicable	LED die attachment
8331D	Epoxy	Silver	20 minutes	LED die attachment

Greases

Thermally conductive grease are easy-to-use, 1 part systems that function in the same way as thermally conductive adhesives, but does not permanently bond components, allowing for rework and component replacement.

Product	Chemistry	Color	Temperature Range	TC (W/m-K)
8617A	Silicone-free oil	White	-50 to 125 °C (-58 to 257 °F)	3
8618	Silicone-free oil	Grey	-50 to 125 °C (-58 to 257 °F)	6
860	Silicone	White	-40 to 200 °C (-40 to 392 °F)	0.7
8616	Silicone-free oil	White	-70 to 165 °C (-94 to 329 °F)	2