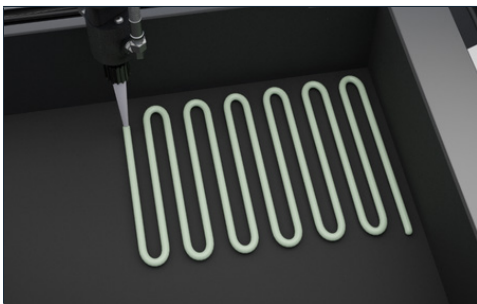


COOLTHERM® MATERIALS

for Electric Motorcycles

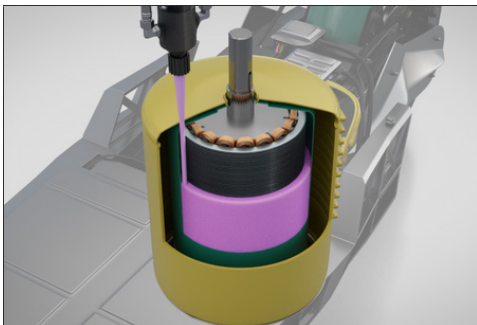
The market for electric motorcycles is growing, with driving trends including government regulation, environmental factors and cost. To support that growth, we offer our thermal management materials, adhesives and coatings that enable electric motorcycles, or e-Motorcycles, to achieve zero emissions and a high-performing electric design.

Thermal management is crucial for e-Motorcycle applications to ensure that batteries, motors, charging systems and other power electronics operate reliably, safely and at optimal temperatures. CoolTherm® thermal management materials reduce operating temperatures, contributing to higher-performing electric transportation. This line of products includes liquid-dispensed thermally conductive gap fillers, potting and encapsulants, and structural adhesives.



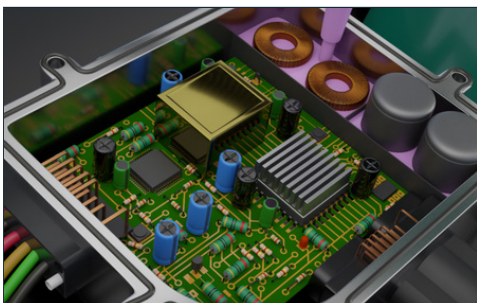
Battery Packs

As battery technology evolves towards increased energy density, the ability to manage heat during charge and discharge cycles is crucial for optimizing performance. Our CoolTherm thermal management materials are fully customizable and compatible with cylindrical, pouch and prismatic battery cells.



Electric Motors

We offer potting and encapsulant materials that are compatible with e-motors. Thermally-conductive epoxy and silicone encapsulants help manage heat, enabling you to increase the power density and life of your electric motor. Our studies have shown a temperature decrease of up to 50°C or an increase in power output up to 30% with CoolTherm.



Power Electronics

CoolTherm adhesives improve heat flow in inductors and transformers and optimize performance during charging & discharging. With low viscosity, these adhesives flow easily into crevices, enabling better impregnation of irregularly-shaped magnetic components and helping to reduce inductor hum.

Gap Fillers

Get the best performance out of your batteries by filling in surface imperfections with a thermally conductive gap filler designed with e-Motorcycle applications in mind. Our gap fillers are available in a range of options, from flexible, low-strength options that ensure serviceability, to products with higher tensile strength and adhesion properties, providing increased strength and structure upon full cure. We also offer low ppm siloxane solutions for sensitive electronic applications.

GAP FILLERS	PRODUCT	CHEMISTRY	THERMAL CONDUCTIVITY (W/m-K)	SHORE HARDNESS (OO)	DENSITY (g/cm ³)
	CoolTherm® SC-3000 LD	Silicone	3.0	75	2.4
	CoolTherm SC-1600	Silicone	3.7	89	3.3
	CoolTherm SC-2000 SLW	Silicone	2.0	65	2.0
	CoolTherm UR-2000	Urethane	2.0	D55	2.6

- Two-Component
- Low Outgas Options
- Room Temperature and Heat Curing
- Electrically Isolative
- 1:1 Mix Ratio
- Protect Against Shock
- Damp Vibration

Adhesives

Formulated for dispensability, either in high flow rate environments in MMD equipment or manually dispensed via cartridge or convenience packaging, our adhesives provide rigidity, structural integrity and a thermal connection where heat is a problem. With our adhesives, you are no longer constrained by mechanical fixtures and can bond a variety of substrates, which can simplify your overall battery pack design.

ADHESIVES	PRODUCT	CHEMISTRY	THERMAL CONDUCTIVITY (W/m-K)	LAP SHEAR STRENGTH (MPa)
	LORD® 852S/25GB	Acrylic	–	18.1 on aluminum
	LORD 5206/55GB	Acrylic	–	19.3 on aluminum
	LORD 7545-A/B	Urethane	–	16.2 on e-coated steel
	CoolTherm TC-2002	Acrylic	1.0	15.8 on aluminum

- Variable Cure Speeds
- Electrically Isolative
- Improve Design Flexibility
- Reduce Complexity
- Room Temperature and Heat Curing

Coatings

Depend on strong, cost-effective coatings to provide insulating barriers around e-Motorcycle batteries and motors. Our LORD JMC-700K thermally-conductive dielectric coating is used to coat magnets, heat sinks and cooling plates in EVs. Sipiol UV single-component dielectric coating cures in seconds with UV light and is ideal for battery cells.

COATINGS	PRODUCT	CHEMISTRY	THERMAL CONDUCTIVITY (W/m-K)	DIELECTRIC STRENGTH (kV/mm)	TEMPERATURE RANGE (°C)
	LORD JMC-700K	Epoxy	0.4-0.5	100 @ 50 µm	-40 to +180
	Sipiol® UV	Acrylic	0.2-0.5	>90 @ 100 µm	-40 to +120

- Heat and UV Curing
- Electrically Isolative
- High Adhesion and Flexibility

Potting & Encapsulants

Our encapsulants facilitate optimum heat transfer because of their high thermal conductivity and low viscosity. Additionally, potting and encapsulants provide protection from dust, moisture and vibration. Our two-component encapsulants exhibit minimal shrinkage during cure, high dielectric strength and thermal conductivity.

POTTING	PRODUCT	CHEMISTRY	THERMAL CONDUCTIVITY (W/m-K)	VISCOSITY (cP @25°C)	DENSITY (g/cm ³)
	CoolTherm SC-309	Silicone	1.0	3,600	1.7
	CoolTherm SC-320	Silicone	3.2	22,000	3.1
	CoolTherm SC-324	Silicone	4.0	30,000	3.2
	CoolTherm EP-6035	Epoxy	1.0	12,000	1.6
	CoolTherm UR-389	Urethane	0.7	14,000	1.5

- Room Temperature and Heat Curing
- Electrically Isolative
- 1:1 Mix Ratio
- Improve Performance
- Protect Electronics
- Reduce Component Stress

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