



# MOLYKOTE® M-77 Paste reduces noise in electric vehicle battery pack

Case study: Paste outperforms other lubricant solutions, delivers necessary insulation properties

## The application

As the transportation industry electrifies and consumer demand for electric vehicles (EVs) grows, battery manufacturers are finding opportunities in meeting the needs of the expanding market. EV and battery manufacturers seek lighter-weight, yet more compact, solutions to gain additional energy density and reduce cost. One immediate route to achieving these goals is eliminating the housings of battery modules and instead bonding individual cells directly to the cooling plate, a strategy known as "cell-to-pack."

## The challenge

A battery supplier for an automotive manufacturer in China was looking to solve an NVH concern and improve the end-user experience for electric vehicle drivers and passengers. The battery company had discovered that with the sudden change in temperature caused by starting the battery liquid cooling system, the screws that connect the cooling plate to the



Electric vehicle batteries need thermoregulation to protect battery performance and lifespan. With demands for faster charging rates and higher, consistent battery performance, dependability of the thermal management system is critical.



Due to temperature swings, the screws securing the coolant system to the battery pack made noticeable noise during expansion and contraction.

pack made noise – necessitating a lubricant solution that would deliver a quiet, comfortable ride.

Not only did the supplier need a solution that would address the NVH concern, but the lubricant also would need to provide adequate insulation properties to protect the components from the temperature changes.

**MOLYKOTE®**

## The solution

The MOLYKOTE® Specialty Lubricants team was confident it could provide a solution that would both reduce the noise and provide the thermal insulation properties demanded by the application. The team put MOLYKOTE® M-77 Paste to the test against other lubricant technologies to see which one could best meet the electric vehicle battery manufacturer's requirements.

During testing, the team discovered that while most of the technologies could meet some of the requirements, only silicone-based MOLYKOTE® M-77 Paste, with its MoS<sub>2</sub> solid lubricant, was able to both reduce the noise and meet the insulation needs.

## Reduce NVH concerns and deliver key insulating properties

MOLYKOTE® M-77 Paste can prevent noise and protect components across a wide range of temperatures. It is suitable for low to moderate loads and low speeds that are subjected to water and extreme temperatures. Suitable applications include battery packs, brake anchor plates, disc brake pistons, and other metal-to-metal frictional and contact surfaces.

MOLYKOTE® M-77 Paste delivers:

- Paste lubrication up to +230°C (+446°F); dry lubrication up to +400°C (+662°F)
- Good water resistance
- Good volatilization properties, leaving virtually no residue
- Compatibility with many types of elastomers and plastics



## Typical properties of MOLYKOTE® M-77 Paste

Specification writers: These values are not intended for use in preparing specifications. Please contact your local MOLYKOTE® sales representative prior to writing specifications on this product.

Standard <sup>(1)</sup>	Test	Result
	Color	Black-gray
<b>Penetration, density, viscosity</b>		
ISO 2137	Unworked penetration	280-330 mm/10
ISO 2811	Density at 20°C (68°F)	1.95 g/ml
DIN 51 562	Base oil viscosity at 25°C (77°F)	125 mm <sup>2</sup> /s
<b>Temperature</b>		
	Service temperature <sup>(2)</sup>	-45 to +230°C (pastelike) up to +400°C (dry)
	Service temperature <sup>(2)</sup>	-49 to +446°F (pastelike) up to +662°F (dry)
<b>Load-carrying capacity, wear protection, service life</b>		
	Four-ball tester	
DIN 51 350 pt.4	Weld load	2,000 N

<sup>(1)</sup>ISO: International Standardization Organization. DIN: Deutsche Industrie Norm.

<sup>(2)</sup>Temperature resistance of solid lubricants.

## Learn more: Contact us

To learn more about the advantages of MOLYKOTE® M-77 Paste for EV battery pack applications, automotive brakes, or other metal-to-metal frictional and contact applications – as well as other tough lubrication challenges – contact your MOLYKOTE® technical representative or visit [molykote.com](http://molykote.com).

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