

# Control Battery Heat with BETATECH™ Thermal Interface Material

## Safe and Sustainable by Design



### Challenge

Batteries perform best operationally and from a safety standpoint when their temperature is maintained through materials that enhance heat dissipation and avoid thermal runaway. These materials must have the properties to meet these requirements, be easy to apply in high-volume manufacturing environments, and enable the ability for repair or replacement of battery components as needed through the life of the battery pack assembly.

#### BETATECH™ Thermal Interface Material – Physical Properties

	BETATECH™ 1K TIM	BETATECH™ 2K TIM
Technology*	1K polyurethane	2K polyurethane
Thermal conductivity	2 – 3 W/mK	2 – 4 W/mK
Viscosity	200 – 600 Pa.s at 10 1/s	100 – 300 Pa.s at 10 1/s
Lap shear / Pull-out force	< 0.1 MPa	< 0.3 MPa

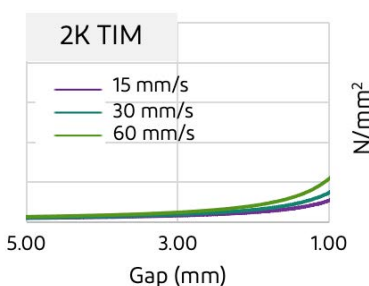
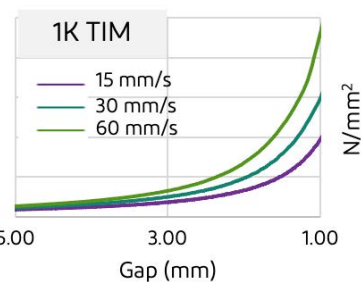
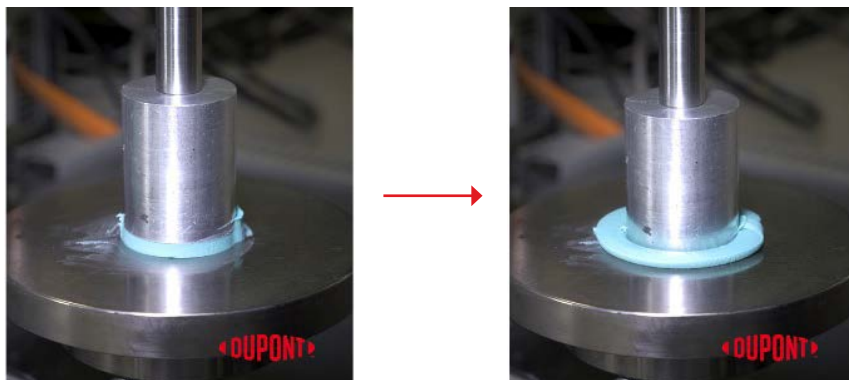
\*Silicone and diisocyanate-free

Source: DuPont

### Project

Thermal management for battery modules is essential to safety and long service life. As a market leader in adhesive and sealing technology, DuPont has applied its materials science know-how to solving battery pack thermal management issues. The result is a game-changing solution, BETATECH™ thermal interface material, for use in battery pack assembly between the battery cells and the heatsink.

### BETATECH™ Thermal Interface Material – Compression Performance



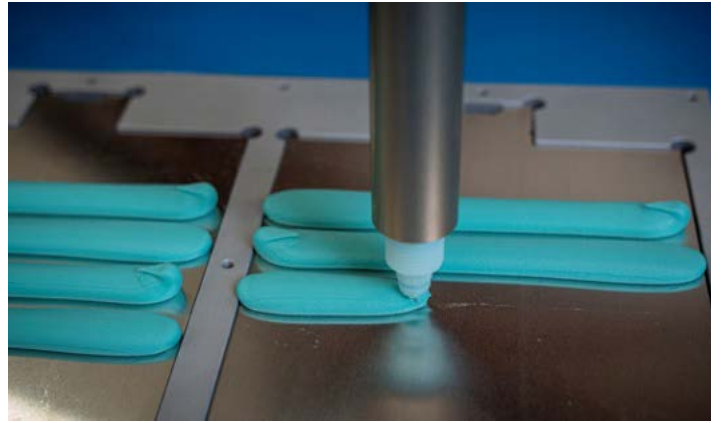
Source: DuPont

## Solution

DuPont utilizes in-house application development expertise to work closely with customers to develop viable solutions that can be reproduced in an assembly environment and are safe and sustainable by design.

BETATECH™ thermal interface material is available as a 1K or 2K diisocyanate- and silicone-free dispensable thermal-conductive polyurethane product applied between the battery module and heatsink. Its ease of use leads to production efficiencies that allow for a repeatable process for high-volume assembly environments. It demonstrates other benefits including:

- **Non-abrasive formulation** – no equipment wear
- **Fast dispensing** – compression or injection process compatible
- **Fast joining** – low press-in force
- **Retention of thermal conductivity** – due to good contact between battery cells and cooling plate with no gaps
- **No sagging** in vertical aging test
- **Safe and sustainable** by design through diisocyanate- and silicone-free formulation
- **Long working time** – >30 minutes
- **No physical change** over aging
- **Repairability** – low pullout force
- **Silicone-free** to avoid any surface contamination that might impact thermal conductivity



BETATECH™ thermal interface material can be hand applied or automatically dispensed for high-volume manufacturing.

## Result

BETATECH™ thermal interface material is a novel solution to help control heat by maintaining thermal conductivity over a wide operating temperature range. With the added benefits of ease of dispensing and fast joining, BETATECH™ is currently specified for mass volume production on several OEM electric vehicle models.

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