

Protecting EV/PHEV Battery Packs

We are global innovators in materials science.

Our team of engineers applies extensive industry knowledge about sub-assembly design to help safeguard EV/PHEV battery packs from the consequences of excessive heat.

With increased charging speeds, battery packs emit ever-increasing amounts of heat. Are packs actively or passively cooled? Must the thermal material act as a dielectric barrier? Is the pack silicone- or non-silicone mandated? Are the thermal materials themselves relied upon for mechanical support or for high compliance?

Ultimately, the appropriate choice of thermal interface materials satisfies the design constraints while simultaneously satisfying the economics.

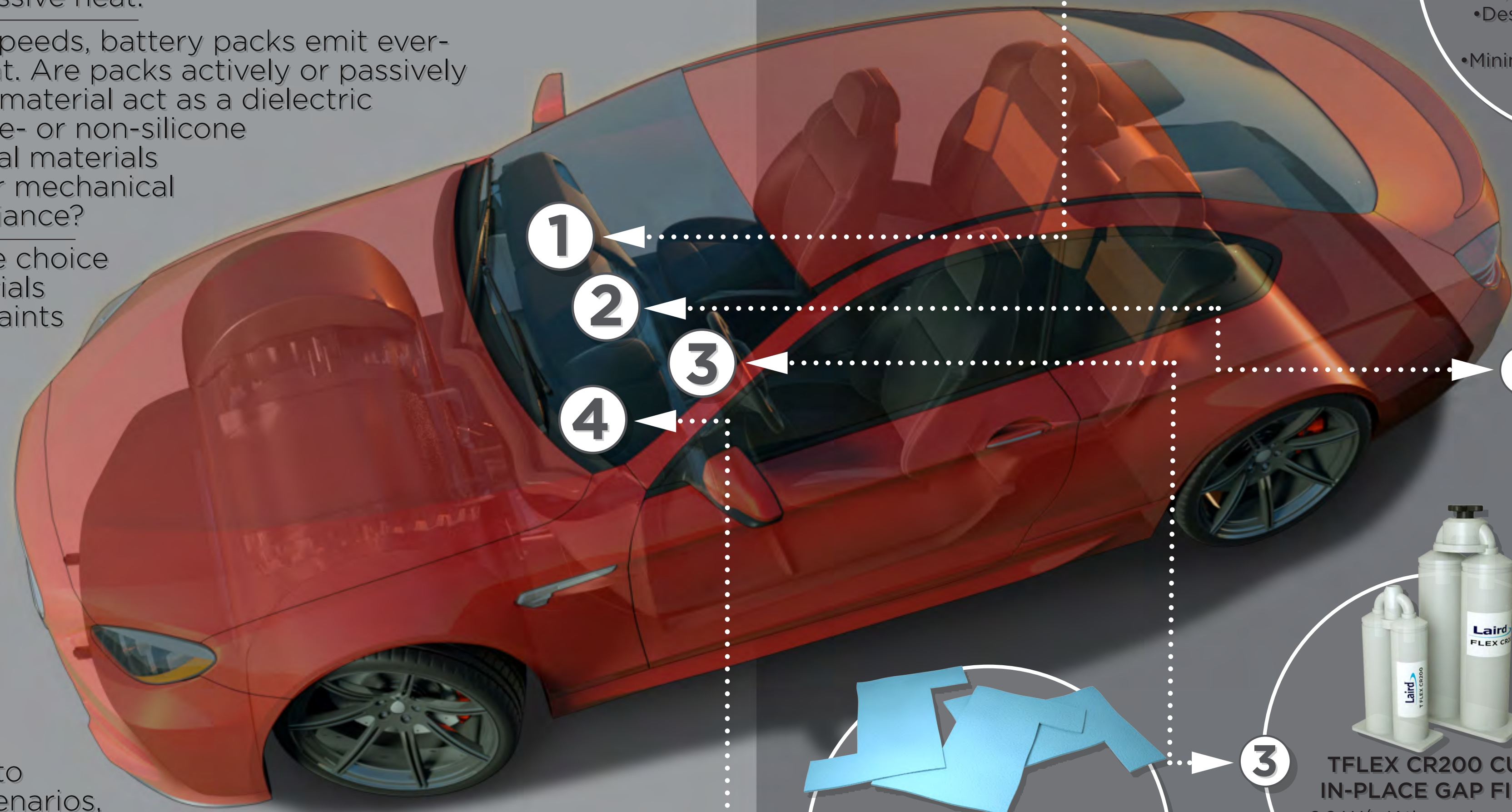
It comes after extensive evaluation of the total cost of ownership and true cost of implementation in a serial production setting.

Huge material volumes are required. The importance of fast placement of preferred materials cannot be overstated.

We get behind the wheel to help. Laird tests, posits scenarios, models/simulates, refines working hypotheses, iterates, and validates.

We are automotive grade. With agility for two decades.

We listen. We question. We synthesize. We know about EV/PHEV battery packs. Put our experience to use.



1 **TPUTTY 508 SINGLE PART DISPENSABLE GAP FILLER**

- 3.7 W/mK thermal conductivity
- Designed for automation
 - Vertical stability
- Minimum component stress
- RoHS compliant

2 **TFLEX SF600 THERMALLY CONDUCTIVE GAP PAD**

- 3.0 W/mK conductivity
- Silicone-free for sensitive apps
- 0.25mm to 3.56mm thickness
- In 0.010-inch increments
- RoHS compliant

3 **TFLEX CR200 CURE-IN-PLACE GAP FILLER**

- 2.0 W/mK thermal conductivity
- 2-part silicone base
 - Low viscosity
- Ideal for large gap tolerances

4 **TFLEX 400 HD THERMAL PAD**

- 40 W/mK conductivity
- High deflection gap filler
- 1mm to 4mm thicknesses
- Excellent surface wetting

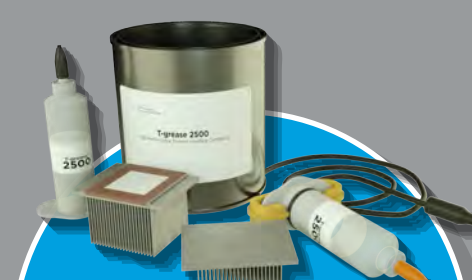




We Make Technology Work™

Protecting ADAS/Autonomous Driving Systems

Protecting LED Component Systems



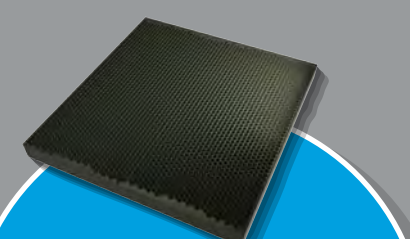
TGREASE 2500

- 3.8 W/m-K thermal conductivity
- Silicone free thermal grease
- Ends migration issues
- Environmentally friendly



TPUTTY 607 ONE-PART DISPENSABLE GAP FILLER

- 6.4 W/m-K thermal conductivity
- Vertical reliability
- Low outgassing
- For PCB apps/lidar



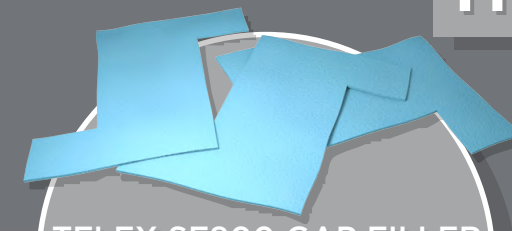
Q-ZORB THERMOSET MICROWAVE ABSORBER

- Nomex™ or fiberglass honeycomb core
- Optimize insertion loss
- Optimize reflection loss
- For radar/radar brackets



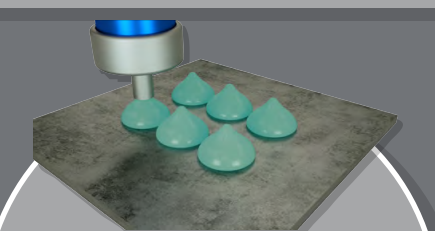
BEAM SHADING STAMPED METAL

- Beam shading and steering
- Rapid prototyping
- Long term performance simulation
- *NAL Patent Pending



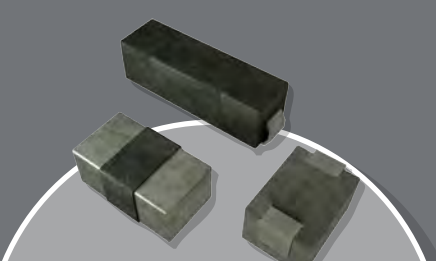
TFLEX SF800 GAP FILLER

- 8.0 W/mK conductivity
- Superior pressure vs. deflection
- Low total thermal resistance
- Excellent surface wetting



TPUTTY 508 SINGLE PART DISPENSABLE GAP FILLER

- 3.7 W/mK thermal conductivity
- Designed for automation
- Vertical stability
- Minimum component stress
- RoHS compliant



EMI LOW CURRENT MAGNETIC CERAMIC CHIP BEADS

- Superior noise suppression
- Currents up to 10A; low DCR
- Vibration resistant
- Small footprint



TGREASE 2500 THERMALLY CONDUCTIVE GREASE

- 3.8 W/mK thermal conductivity
- Environmentally friendly; silicone free
- Thoroughly wets out thermal surfaces
- No migration issues



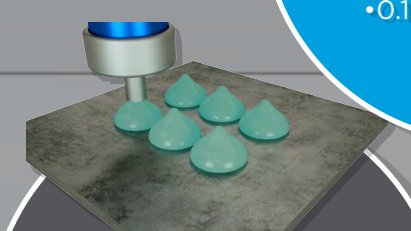
TFLEX CR200 CURE-IN-PLACE GAP FILLER

- 2.0 W/mK thermal conductivity
- 2-part silicone base
- Low viscosity
- Ideal for large gap tolerances



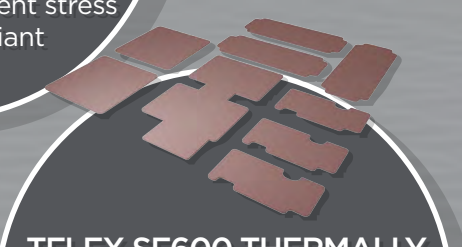
SMD ELECTRONIC CONTACT

- Board/device interconnections
- Nickel, tin, gold, silver platings
- 0.13mm thickness



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- Vertical stability
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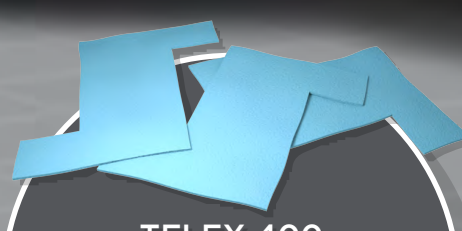
TFLEX SF600 THERMALLY CONDUCTIVE GAP PAD

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TFLEX CR200 CURE-IN-PLACE GAP FILLER

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TFLEX 400 HD THERMAL PAD

- 40 W/mK conductivity
- High deflection gap filler
- 1mm to 4mm thicknesses
- Excellent surface wetting



FABRIC-OVER-FOAM GASKET

- Plated, conductive fabrics/foams
- EMI shielding effectiveness >100dB
- Low surface resistivity
- RoHS compliant; Halogen free



MGV POWER INDUCTOR

- Lowest cost design goal
- Magnetic shielded
- High current/low profile
- Low DCR/high efficiency



EMI LOW CURRENT MAGNETIC CERAMIC CHIP BEAD

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- Currents up to 10A; low DCR
- Vibration resistant
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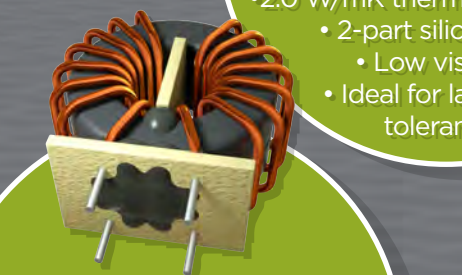
TPUTTY 607 SINGLE PART DISPENSABLE GAP FILLER

- Low stress on components
- Designs for low cost
- Maximum thermal transfer
- PCB apps



LOW PROFILE SMD DC-DC POWER INDUCTOR

- Lowest cost design goal
- Maximum shielding
- Down to 1.8mm part height
- For space conscious designs



BROADBAND WIRE WOUND COMMON MODE CHOKE

- Nanocrystalline core
- Enables higher switching mode designs
- High power/high efficiency apps

Protecting Infotainment/Cluster Systems

Protecting EV/PHEV Battery Packs

Protecting EV Powertrain Electronics

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