



# Thermally Conductive Materials for Electric and Hybrid Vehicle Batteries

## Application Note

**intertronics**

adhesives, coatings, sealants & equipment  
for your manufacturing and technology applications

t 01865 842842

e [info@intertronics.co.uk](mailto:info@intertronics.co.uk)

[www.intertronics.co.uk](http://www.intertronics.co.uk)

## Thermally Conductive Materials for Electric and Hybrid Vehicle Batteries



### Thermal Management of Electric Vehicle Power Sources

Responding to a strong and increasing demand in innovative manufacturing concepts for electric and hybrid vehicle batteries, Polytec PT provides adhesives, pottings and greases with high thermal conductivities that are customized with regard to processing parameters, thermal and mechanical properties, and service durability. The need for power dissipation from the cell to the surrounding medium requires an ever effective thermal management in order to ensure an efficient, reliable and long-time operation of the components.

### Creating Solutions Through Polymers

The assembly and integration of single hard-case (prismatic) or pouch cells to build a secure and durable battery system requires mechanical fixing, thermal management, and vibration damping. Conductive adhesives provide an ideal solution thanks to their:

- Structural strength
- Vibration resistance
- Dielectric strength
- High thermal conductivity
- Good chemical resistance

Apart from batteries, there is an increasing demand for adhesive bonding, sealing and encapsulating of other electric and hybrid vehicle parts like motors, converters, control units, and power electronics devices. Regardless of the application, good thermal management improves durability of the end product and hence positively affects its energy efficiency and eco-friendliness.

### Alternatives to Mechanical Fixing, Brazing and Welding

The new high thermally conductive products make adhesive bonding an increasingly attractive alternative to welding, soldering and mechanical joining. Especially the epoxy-based adhesives care for both structural strength and durability of the adhesive joint.

## Thermally Conductive Materials from Polytec

Polytec provides both thermal conductive adhesives, silicone-free thermal greases and gap fillers, all with a design toward ease of use and durability. In coordination with customer and market requirements, we are constantly developing new, improved adhesives and pottings with high thermal conductivities towards 2 W/mK and more, customized to the respective application.

For more information, please contact [info@polytec-pt.de](mailto:info@polytec-pt.de).



### Thermally Conductive Adhesives and Pottings

Product Code	Polytec TC 417	Polytec TC 451	Polytec TC 418
Features	Potting of large cavities, excellent chemical and moisture resistance	High Tg, bonding, potting and sealing	High thermal conductivity, flexible version available
Consistency	Flowable black paste	Flowable soft black paste	High viscous flowable gray paste
Cure Schedule	23 °C / 24 hours	23 °C / 16 hours	23 °C / 48 hours
Operating Temperature Range	-55 °C ... 180 °C	-55 °C ... 180 °C	-55 °C ... 160 °C
Thermal Conductivity	0.8 W/mK	0.7 W/mK	1.6 W/mK

### Thermal Greases, Pads & Gap Fillers

Product Code	AOS 52022	Sure-form 52153	Micro-Faze A
Features	Non-silicone, thixotropic thermal grease	Highly viscous, dispensable gap filler	Dry to touch silicone-free thermal pad
Consistency	Smooth, off-white paste	Gray paste	Thermal interface film
Volume resistivity	1.65 x 10 <sup>14</sup> ohm-cm	2.15 x 10 <sup>15</sup> ohm-cm	n.a.
Operating Temperature Range	-40 °C to 200 °C	-40 °C to 200 °C	n.d.
Thermal Conductivity ASTM D 5470	0.9 W/mK	3.5 W/mK	2.8-4.5 W/mK depending on film thickness



**Polytec PT**

Polymere Technologien

# Polytec PT GmbH Polymere Technologien

Polytec PT GmbH develops, manufactures and distributes special adhesives for applications in electronics, electrical engineering and automotive electronics as well as the solar industry and the manufacture of smart cards.

In addition to an extensive portfolio of electrically and thermally conductive adhesives, transparent and UV-hardening products, Polytec PT develops tailored formulations for the most demanding of adhesive applications.



**Polytec PT GmbH**  
**Polymere Technologien**  
Polytec-Platz 1-7  
76337 Waldbronn  
Germany  
Tel. +49 7243 604-4000  
Fax +49 7243 604-4200  
info@polytec-pt.de  
www.polytec-pt.de

**Polytec France**  
39, rue Louveau (Bât. Orion)  
92321 Chatillon Cdx  
France  
Tel. +33 1 49656900  
Fax +33 1 57214068  
serviceclients@polytec.fr  
www.polytec-pt.com

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