

**INDUSTRY  
SOLUTIONS.**

**Material  
Solutions.**

**CHT**

**SMART CHEMISTRY  
WITH CHARACTER.**

## **SILICONES FOR LED & LIGHTING APPLICATIONS**

- ▶ **ADHESIVES**
- ▶ **POTTING COMPOUNDS**
- ▶ **THERMAL TRANSFER MATERIALS**
- ▶ **OPTICALLY CLEAR ENCAPSULANTS**

# SILICONES FOR LED & LIGHTING

## HEAT DISSIPATION

The need for efficient transfer of heat is a key design requirement as components continue to reduce in size and increase in power, this is particularly apparent with LEDs. This unwanted heat must be dissipated away from the components to maintain performance and avoid premature failure or reduced light output. CHT **SILCOTHERM**<sup>®</sup> silicones are very effective in performing this function and providing other benefits such as adhesion, protection from vibration and moisture or other environmental contaminants.

### **SILCOTHERM**<sup>®</sup> Adhesives:

- ▶ RTV & Heat cured, including fast cure 2-Part RTV
- ▶ Flowable and Paste versions
- ▶ Thermally conductive up to 2.3W/mK
- ▶ UL 94 V-0 approved materials
- ▶ High temperature resistance up to +260°C

### **SILCOTHERM**<sup>®</sup> Encapsulants:

- ▶ RTV & Heat cured
- ▶ Range of viscosities down to 1950 mPa.s
- ▶ Thermally conductive up to 2.1W/mK
- ▶ UL 94 V-0 approved materials
- ▶ High temperature resistance up to +260°C

## OPTICAL PERFORMANCE

Optical performance is greatly affected by the what is in front of the LED. Encapsulants used to protect the LEDs will need a high degree of optical clarity and resistance to yellowing when exposed to UV light. CHT Silicone encapsulants include products with UV resistance and optical clarity.

### **Optically Clear Encapsulants:**

- ▶ UV Resistant
- ▶ Range of harnesses from Gels up to 65 Shore A
- ▶ Low viscosities down to 630 mPa.s

## LENS CONTAMINATION

Silicone adhesives are ideal for sealing and bonding fixtures, lenses and enclosures. However, traditional silicone sealants produce by-products when exposed to heat which can leave traces of impurities in the inside of lenses and impair optical performance. CHT have a number of low outgassing silicone adhesives that will not leave any impurities on the lens.

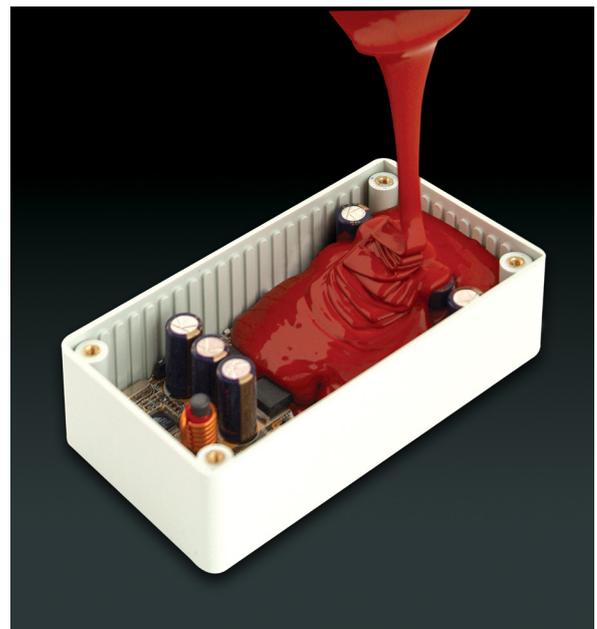
## PCB PROTECTION

Protecting PCBs in critical applications which are exposed to harsh environmental working conditions is essential, if product failure is to be avoided. A conformal coating, silicone or acrylic, is normally applied as a thin layer across the surface of a PCB, covering all components and delicate wiring.

CHT coatings are effective, as they maintain good adhesion to all the component substrates, are unaffected by changes in operational temperature and are resistant to contaminants, such as moisture and chemicals. Their ability to flow around, under and over the components without leaving areas exposed to the atmosphere, especially on sharp edges, is very important.

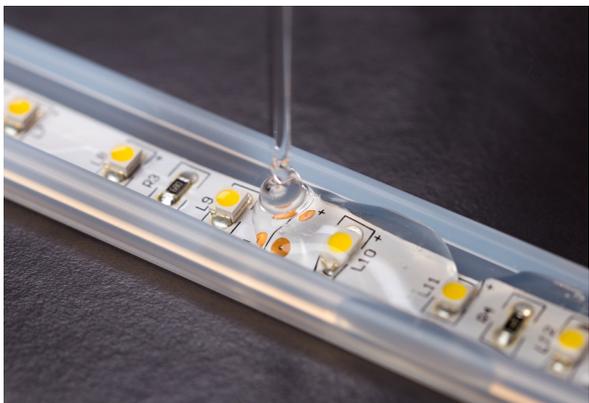
### **SILCOTHERM**<sup>®</sup> Greases or Compounds:

- ▶ Thermally conductive up to 2.3.0 W/mK
- ▶ Non-setting work stable
- ▶ High temperature resistance up to +200°C



## LED APPLICATIONS

### ▶ LEDs / Lenses



### ▶ Automotive Light Guides / Light Pipes



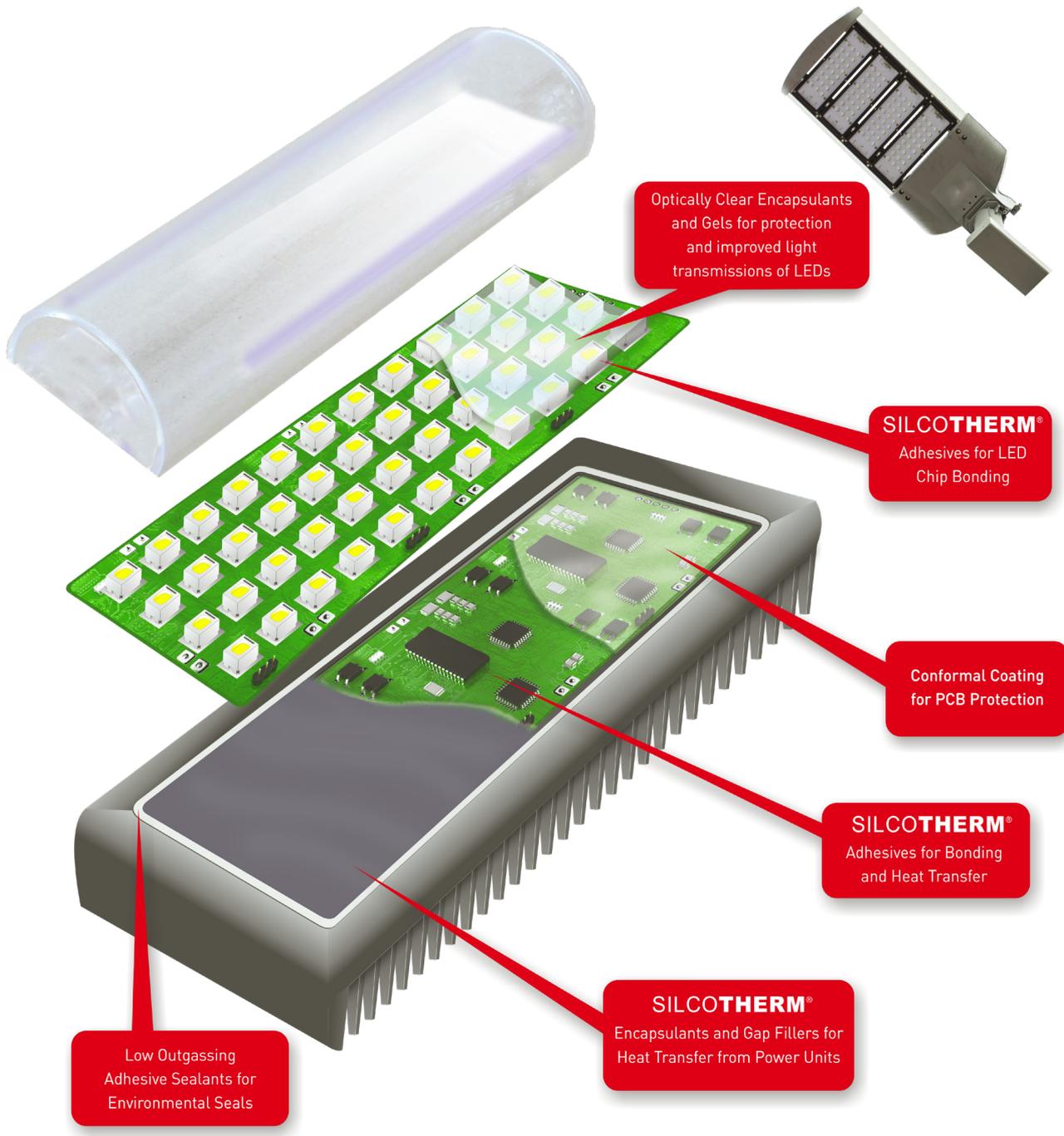
### ▶ Power Supplies / LED Drivers



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[material@cht.com](mailto:material@cht.com)

# SILICONES FOR LED & LIGHTING



## CHT Optically Clear Encapsulants & Gels

Product	Mix Ratio	Colour	Mixed Viscosity	Gel Time at 25 °C	Hardness Shore A	Elongation	Refractive Index
QSi 212	1:1	Transparent	6,500 cP	60 mins	60	120%	1.41
QSi 214	1:1	Transparent	6,000 cP	30 mins	40	100%	1.40
QSi 216	10:1	Transparent	3,700 cP	6 hrs	40	100%	1.41
QSi 220	10:1	Transparent	4,100 cP	> 24 hrs	30	150%	1.41
QSi 223	1:1	Transparent	2,800 cP	135 mins	60	N/A	1.41
TufGel 330	1:1	Transparent	700 cP	70 mins	30-55 (Hardness, Shore 00)	N/A	1.41
<b>Injection Moldable for Optics</b>							
SilSo Clear 21002	1:1	Transparent	13,500 cP	> 24 hrs (Pot Life at 23°C/73°F)	67	110%	1.41

## Summary of CHT Silicone Materials & Applications

Silicone Material	Heat Dissipation	Encapsulation & Potting	Bonding & Sealing	Optically Clear Potting	PCB Coating
1-Part - RTV Paste	✓		✓		
1-Part - RTV Flowable		✓	✓		✓
1-Part - RTV Self Level	✓		✓		
2-Part - RTV Paste Fast Cure	✓		✓		
1-Part - Heat Cured Paste	✓		✓		
1-Part - Heat Cured Flowable	✓	✓	✓		
2-Part - RTV Flowable		✓			
2-Part - Heat Accelerated RTV	✓	✓		✓	
2-Part - Heat Cured		✓		✓	

**VISIT OUR WEBSITE**  
[www.cht-silicones.com](http://www.cht-silicones.com)

# WE ARE AROUND THE WORLD

## AMERICAS:

- ▶ CHT BRAZIL Cajamar
- ▶ CHT BRAZIL Piracaia
- ▶ CHT CHILE Santiago
- ▶ CHT COLOMBIA Bogotá
- ▶ CHT COLOMBIA Sabaneta
- ▶ CHT HONDURAS Villanueva
- ▶ CHT MEXICO Lerma
- ▶ CHT MEXICO Torreón
- ▶ CHT PERU Lima
- ▶ CHT USA Cassopolis
- ▶ CHT USA Richmond

## EUROPE:

- ▶ CHT AUSTRIA Meiningen
- ▶ CHT BELGIUM Kortrijk
- ▶ CHT FRANCE  
Villefranche-sur-Saône
- ▶ CHT GERMANY  
HEADQUARTER  
Tübingen
- ▶ CHT GERMANY  
Dusslingen
- ▶ CHT GERMANY Geretsried
- ▶ CHT GERMANY Oyten
- ▶ CHT ITALY Lainate, Milan
- ▶ CHT ITALY Sesto Ulteriano, Milan
- ▶ CHT POLAND Lodz
- ▶ CHT SPAIN Barcelona
- ▶ CHT SWITZERLAND Montlingen
- ▶ CHT UK Bridgwater
- ▶ CHT UK Stockport
- ▶ KEIM ADDITEC SURFACE  
Kirchberg



**AFRICA:**

- ▶ CHT SOUTH AFRICA Durban
- ▶ CHT TUNISIA Bou Argoub
- ▶ CHT ZIMBABWE Harare

**ASIA:**

- ▶ CHT BANGLADESH Narayanganj
- ▶ CHT CHINA Dongguan
- ▶ CHT CHINA Hong Kong
- ▶ CHT CHINA Shanghai
- ▶ CHT CHINA Tianjin
- ▶ CHT INDIA Mumbai
- ▶ CHT INDIA Taloja
- ▶ CHT PAKISTAN Lahore
- ▶ CHT TURKEY Istanbul
- ▶ CHT VIETNAM Ho Chi Minh City

**OCEANIA:**

- ▶ CHT AUSTRALIA Melbourne

# MANUFACTURING SILICONE COMPOUNDS FOR OVER 40 YEARS

CHT have extensive R&D facilities located throughout the world and much of our research work is focused on electrical and electronic applications developing coatings, thermal transfer compounds and neutral cure sealants. Our customer focused development programme and flexible production facilities enable us to keep pace with the needs of today's modern production methods and design requirements.

Qualified, experienced sales and technical staff are readily available to make site visits to advise on product selection and production methods. Our expertise extends into all areas of 1 and 2 part RTV silicone chemistry with a strong bias towards application based solutions.

CHT's silicone expertise enables our customers to benefit from technical and manufacturing support within Europe, China and the USA.

Our team of experts is ready to help you find a silicone solution that meets your requirements and exceeds your expectations.

## BESPOKE SERVICE

Our adaptable facilities based upon batch production allow us to offer formulations developed to meet very specific application requirements. Subject to strict commercial evaluation we can chemically engineer our products and change any of the following properties:

- ▶ Rheology – paste to free-flowing low viscosity
- ▶ Cure speed and tack free times
- ▶ Thermal conductivity
- ▶ Hardness
- ▶ Colour
- ▶ Operating temperature range
- ▶ Cure mechanism
- ▶ Packaging and delivery systems



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Interested in further information or product samples?

Please contact: [material@cht.com](mailto:material@cht.com)