

**INDUSTRY
SOLUTIONS.**

**Material
Solutions.**

CHT
SMART CHEMISTRY
WITH CHARACTER.

SILCOTHERM®

**THERMAL INTERFACE MATERIALS
THERMAL TRANSFER MATERIALS
POTTING AND ENCAPSULATION COMPOUNDS
HEAT SINK GREASES/COMPOUNDS
SILICONE ADHESIVES
GAP FILLERS**

MANUFACTURING SILICONE COMPOUNDS FOR OVER 40 YEARS

CHT have acquired an enviable reputation for producing high quality specialist chemicals which have been proven to perform to the highest standards in the most demanding applications. With the acquisition in 2017 of the ICM Silicones group, including ACC Silicones Ltd, Quantum Silicones and ICM Products, they have further enhanced their capabilities, industry knowledge and global reach within the silicone market. Key industries serviced include the aerospace, electronics and automotive industries.

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.

The enlarged CHT silicones expertise enables our customers to benefit from technical and manufacturing support within Europe, China and the USA.

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

**We are CHT, Smart Chemistry with Character.
Together with ICM, ACC and QSi we are the most customer
centric specialty silicones expert. We are committed to
finding your individual solution.**

CHALLENGE US NOW!

**Get in touch with us!
silicone-experts.cht.co**

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SILCOTHERM® - PRODUCT RANGE



SILICONE ADHESIVES:

Thermally conductive adhesives enable you to permanently bond your component to some form of heat sink and eliminate the need for additional mechanical fixings.

When components and heat sinks are made from materials with different CTE's, air gaps can form during thermal cycles. Although these may only be seen at a micro level they will cause heat to build up. Using a flexible silicone adhesive will prevent this from happening and ensure maximum heat dissipation in all circumstances.

Silicone adhesives can also be used to form gaskets which will not only transfer heat but also form a seal against moisture and other environmental contaminants. They may be used to secure or provide support and vibration resistance to large capacitors and other components that generate heat.

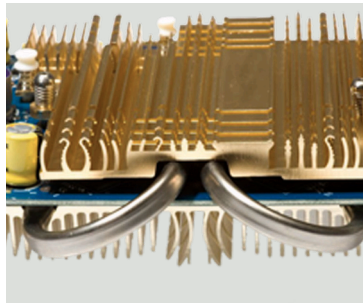
Silicone adhesives utilise two basic chemistries:

Condensation Cure (RTV)

- ▶ 1-part systems which will cure at room temperature
- ▶ 2-part systems with accelerated room temperature cure

Addition Cure

- ▶ 1-part systems which offer rapid cure but require the use of heat



GAP FILLERS:

The **SILCOTHERM®** gap fillers are very soft thermally conductive, 1:1 paste materials designed to be used as a flexible gap filler within electronic assemblies. They are designed to be used when there is a wide tolerance or gap between component and the heat sink ranging from several mm's to zero. The cured material is not self-bonding but remains flexible allowing for a good interface without creating stress fractures when under compression. For ease of use gap fillers are supplied in Semco twin pack cartridges with static mixers which are widely used within the electronics industry.

KEY FEATURES

- ▶ Very soft
- ▶ Good thermal conductivity with controlled volatile content
- ▶ Convenient twin side by side cartridge system
- ▶ Remain flexible over a wide temperature range



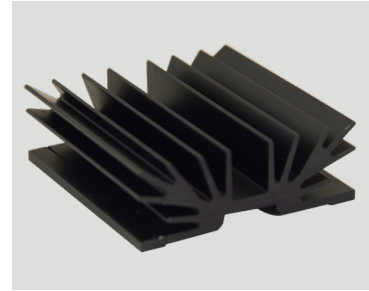
ENCAPSULATION & POTTING COMPOUNDS

Thermally conductive encapsulants can be used when trying to remove heat from a number of components within a single device. Selection of a suitable flowable silicone will facilitate removal of all the air gaps in and around a number of components, thereby providing an effective path for the transmission of any unwanted heat.

In addition to the dissipation of heat, silicone encapsulants will also provide protection from harsh environments, vibration and thermal shock.

HEAT SINK GREASE/COMPOUNDS

Silicone thermal transfer compounds do not cure, have no adhesion and retain their physical properties, as with a grease. The main reason to choose a compound rather than adhesive is the ability to easily rework the component. They are used when there is a requirement for a very thin layer of material. Typically the component would be held in place with some form of mechanical fixing and the compound applied to fill any uneven surfaces, eliminating any air gaps and therefore improve heat dissipation. These silicone compounds are work stable and will withstand high temperatures.



PRINCIPALS OF THERMAL TRANSFER

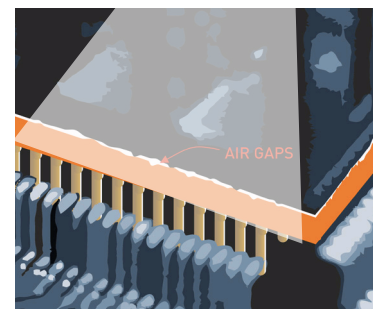
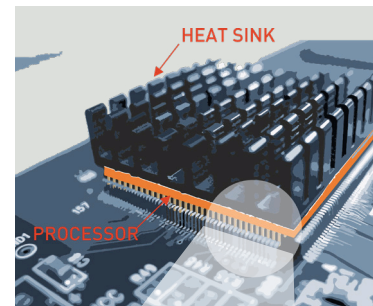
Most electronic components produce heat when in use. The unwanted heat has to be dissipated away from the components to maintain performance and avoid premature failure of the components or device. The need for efficient transfer of heat has become a key design requirement as components continue to reduce in size and increase in power. This is particularly apparent with microchip processors, LED's and power packs.

Designs vary but all involve some form of heat sink which may be a specialised unit or simply the enclosure or base plate. There needs to be an efficient pathway for the heat to travel between this and the components in order to dissipate the heat. The interface between the heat sink and component calls for the use of thermal transfer compounds, without their use any air gaps that exist, regardless of size will act as an insulator and prevent heat transfer (see Fig1 & Fig 2). Silicone polymers are loaded with microscopic, thermally conductive particles. The combination of the two, produce adhesives and other compounds that give superior performance in flexibility, elongation and heat resistance when compared with other organic and epoxy based products.

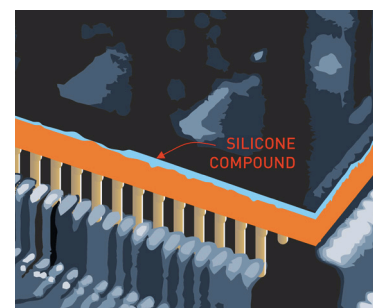
Selection of a suitable thermal transfer compound will depend upon the required thermal conductivity, mechanical constraints, operating environment and production methods. Within the **SILCOTHERM®** range there is a wide selection to choose from.

TYPICAL APPLICATIONS

- ▶ Computer's
- ▶ Automotive electronics
- ▶ LED's
- ▶ Power packs
- ▶ PCB assembly
- ▶ Sensors
- ▶ Radiator systems
- ▶ Photovoltaic junction boxes



▶ Figure 1



▶ Figure 2

Gap Fillers

Product	Mixed Viscosity mPa.s	Mix Ratio	Colour	RTV or Heat Cure	Min Working Temp °C	Max Working Temp °C	Hardness Shore '00'	Thermal Conductivity W/mK
2-Part 1:1 Soft Silicone Compounds								
SE2010	320000	1:1	Black	RTV accelerated with Heat	-60	200	50	1.70
<i>Feature:</i> Thixotropic paste, UL 94 V-0 and RTI @:150°C. Cures to a very soft rubber offering reduced thermal stress on delicate components. Controlled volatile content								

Encapsulation and Potting Materials

Product	Cure	Colour	Mixed Viscosity mPa.s	UL Listed	Min Working Temp °C	Max Working Temp °C	Hardness Shore A	Pot Life mins @ 25°C	Cure Speed		Thermal Conductivity W/mK
									Hrs 25°C	Mins 100°C	
1-Part Silicones Compounds											
AS1420	Addition	Grey	43000	No	-50	260	67			30	1.38
AS1421	Addition	Grey	140000	Yes	-50	210	56			16	2.10
2-Part Silicone Compounds											
QSi1553	Addition	Grey	6000	Yes	-55	260	45	100	24	7	0.68
QSi1553LV	Addition	Grey	4000	Yes	-55	260	45	100	24	7	0.68
<i>Feature:</i> Cures to form a soft rubber, ideal for use with materials of differing CTE's which may cause stress fractures in components											
QSi1573	Addition	Grey	5500	No	-55	204	55	60	24	35	0.90
SE2003	Addition	Brick Red	35000	No	-50	250	80	120	24	30	1.27
SE3000	Addition	Orange	1950	Yes	-70	250	40	50	4	6	1.17
Silicone Gels											
EGel3100	Addition	Grey	29000	No	-55	200		60	8	30	1.55

Adhesives

Product	Mixed Viscosity mPa.s	Rheology	Colour	RTV or Heat Cure	Min Working Temp °C	Max Working Temp °C	Hardness Shore A	Thermal Conductivity W/mK
1 Part Adhesive Sealants								
AS1420	43000	Flowable	Grey	Heat Cured	-50	260	67	1.38
*AS1421	140000	Paste	Grey	Heat Cured	-50	210	56	2.10
AS1607		Paste	White	RTV	-50	220	70	1.58
*AS1701		Paste	Black	RTV	-50	220	52	0.60
AS1802	350000	Self levelling	Grey	RTV	-50	220	67	2.30
*AS1802 Black	350000	Self levelling	Black	RTV	-50	220	67	2.30
<i>* Feature:</i> UL94 V-0 approved file No.E334038								
AS1803	350000	Self levelling	White	RTV	-50	220	65	1.55
2 Part Adhesive Sealants (10:1 Mix Ratio)								
AS2701		Paste	Grey	RTV	-50	200	65	1.55
<i>Feature:</i> Fast room temperature cure								

Heat Transfer Paste

Product	Mixed Viscosity mPa.s	Rheology	Colour	RTV or Heat Cure	Min Working Temp °C	Max Working Temp °C	Hardness Shore A	Thermal Conductivity W/mK
1-Part Non Setting Compounds								
SG500	Paste	Paste	White	Non Curing	-50	150	N/A	0.77
SG502	Paste	Paste	White	Non Curing	-50	200	N/A	3.00

We are CHT, Smart Chemistry with Character. Together with ICM, ACC and QSi we are the most customer centric specialty silicones expert. We are committed to finding your individual solution.

CHALLENGE US NOW!

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