

Silicone Gel

Silicone polymers and elastomers have particular inherent physical properties including:

- ▶ Wide operating temperature range -115 to 300°C
- ▶ Excellent electrical properties
- ▶ Flexibility
- ▶ UV resistance
- ▶ Good chemical resistance
- ▶ Resistant to humidity and water
- ▶ No or low toxicity
- ▶ Easy to use

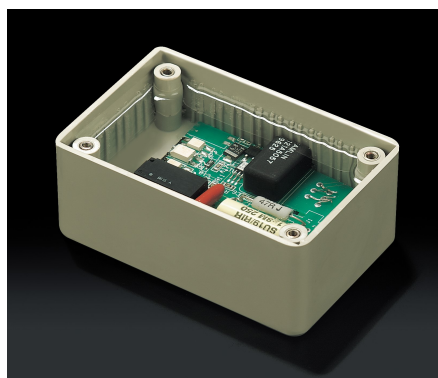


Silicone gels share many of these characteristics; formulated to form a very soft cured elastomer, they can provide the very best environmental protection and are able to absorb potentially damaging vibration. These soft energy absorbent gels find two major application areas, medical and electronics. An additional physical property of many silicone gels is their optical clarity, opening new applications in the development of LED lighting technologies.

Chemistry

The silicone chemistry used to produce silicone gels is known as Addition Cure, using a platinum based catalyst system. They normally come as 2-part systems with a 1:1 mix ratio, although there are a few 1-part systems available in the market. Most of these gels will cure at room temperature with speeds ranging from 1 to 24 hours. Heat can also be used to accelerate these times down to a few minutes. Products can be formulated which will only cure with the use of heat and therefore, have a very long pot life.

When optical clarity is not required fillers can be added to produce tougher gels with slightly more rigidity. If required, a degree of flame retardancy or thermal conductivity can be formulated into the gels. The refractive index can be increased using special polymers, an important feature for many LED applications.



To summarise some of the benefits of silicone gels:

- ▶ Cures to form soft stable gel
- ▶ Reduced thermal stress
- ▶ Vibration control
- ▶ Low ionic content
- ▶ Low volatile content
- ▶ Reworking possible
- ▶ Optical clarity
- ▶ Easy to use

Applications

Electronics

Automotive electronics has become a major user of silicone gels. As circuitry has become smaller and more complex, under bonnet applications which are exposed to wide temperature fluctuations and excessive vibration require protection. Silicone gel will not cause stress to components during the wide thermal cycles and by nature absorbs the unwanted vibration. The excellent electrical properties, dielectric strength and resistivity enable designers to use them with confidence.



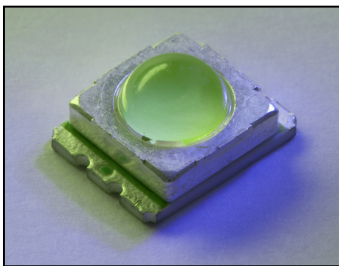
Medical

The most widely known application, breast implants, is not the only medical application gels are also being used to provide protective skin coverings and comfort pads. Pads designed to protect or cushion the body are used for medical conditions ranging from simple corn plasters to cushions designed to prevent pressure sores for wheel chair users or other individuals with mobility problems. In these applications the silicone gel is usually injected into a protective bag of some description.

CHT will not currently supply product for 'in the body' applications such as long term breast implants. They however, supply products for short term out of body exposure.



LED Lighting



One of the fastest growing development areas for silicone gel use is the LED lighting industry. LED's are now used in the manufacture of full colour megascreen displays, signage, display backlighting and for lighting in the automotive, architectural, industrial and domestic markets. Silicone gels are used within the manufacture of individual High Brightness LED's for protection of the diode and to improve light transmission from the diode through the lens. As a packaging material the gel can be used to encapsulate and protect the completed lighting or display units.

CHT Silicones Gels

The list below details many of the standard Silicone Gels. Before selecting a material careful consideration should be given to the relevant Technical Data Sheet.

Product	Description	Colour	RI	Min °C	Max °C	Viscosity mPas
EGel3000	General purpose silicone gel	Transparent	1.40	-55	200	630
EGel3002	Fast cure silicone gel	Transparent	1.40	-55	200	2000
EGel3003	Self bonding silicone gel (Chemical Adhesion)	Transparent	N/A	-55	200	550
EGel3004	Thixotropic silicone gel	Transparent	1.40	-55	200	1000
EGel3100	SILCOTHERM® Thermally Conductive silicone gel	Grey	N/A	-55	200	29000
QGel330	Tough, low viscosity silicone gel	Transparent	1.40	-55	200	675
QGel331	Flame retardant silicone gel	Blue	N/A	-55	200	750

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