Kunze Offers Superior Heat Management for LEDs

The triumphant success of LED technology set in – at the latest – with the development of High Power LEDs. Continuous improvement of light efficiency, colour, and cost-benefit ratio allows for an ever-increasing operative range. LED technology is employed in the automotive industry, in displays and mobile devices as well as in the lighting of roads and buildings. LEDs are more robust than conventional lamps, their energy efficiency and durability are superior, they are small and they operate at low voltage.

Despite these obvious advantages, there are specific guidelines to follow when choosing design and material: of their energy feed, serial produced LEDs convert about 30% into light, while approx. 70% are lost as heat. This calls for sophisticated heat management. LED lighting systems and fast processors require a heat-conducting interface material capable of efficiently conducting heat loss away from the component towards the heat sink. If this is not provided, the LED's lifespan is reduced dramatically.

Manufacturers of LEDs take heat management very seriously, including the aspects of cost-benefit ratio, the amount of space available, and application efficiency. Over the past years, rapid technological progress and increasing power density of high-performance LEDs has had manufacturers and users facing new challenges in the field of heat management.

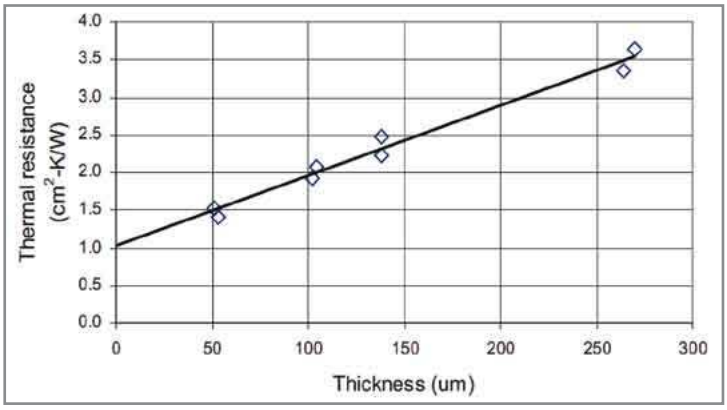
Outdoor or automotive applications are subject to drastic changes in temperature and other environmental factors which can lead to unpredictable effects in lighting. Production costs are necessarily increased by the indispensable application of heat-conducting materials, but they can be minimized by the right choice of material and incorporation of that material at an early stage of the development process.

For LED applications which, due to their build, require electric insulation of the semiconductor, ceramic-filled silicone is preferably used. Its thermo conductivity and puncture strength are excellent, and it boasts both low thermal contact resistance and good double-sided adhesion. Its temperature resistance is superior to that of double-sided adhesive acrylic tape, making it reliable and user-friendly.

Part	KU-	SAS20
General properties		
Material		Silicone
Colour		White
Thickness	µm	+-15 200
Outgassing (LMW Siloxane, Generating Gas Analysis)	ppm	∑ D3 -D10 = 1
Mechanical and electrical properties		
Peeling strenght[1]	N/cm	6,4
Breakdown Voltage (Voltage ramp)[2]	kV	6,5
Breakdown Voltage (Voltage steps)[3]	kV	5,0 at 25°C / 4,5 at 80°C
Thermal properties		
Thermal conductivity	W/mK	1,0

[1] 180° Peeling strength with Al plate, at 23°C, peeling speed: 300mm/min, sample was boned using a 2kg roller, measurement follows after 10 min.
[2] Voltage ramp 1000 V/s
[3] Step by step voltage increments until dielectric breakdown

Main Specification of the KU-SAS HEATPAD®.



Thickness versus thermal resiatance (measured by laser-flash method).

Kunze Folien GmbH have expanded their product range by a silicone foil especially suited for LED applications which meets the increasingly demanding requirements regarding efficient heat conductance. KU-SAS HEATPAD® is a double-sided adhesive silicone foil with extraordinary thermal properties and powerful adhesion. The softness of this foil compensates perfectly for any potential unevenness of the LED carrier, therefore outmatching other interface materials. KU-SAS can even be easily applied to larger surfaces such as LED modules. ■