



FAQ: Heat Flux Measurements

What is heat flux?

Heat flux is the rate of heat that passes through a surface. It is proportional to the temperature difference. Heat flux occurs wherever a temperature disequilibrium occurs between two objects. Heat flux or thermal flux is the rate of heat energy transfer through a given surface, per unit surface. The SI derived unit of heat rate is joule per second, or watt. Heat flux density is the heat rate per unit area. In SI units, heat flux density is measured in $[W/m^2]$. There are three types of heat fluxes: conduction, convection, and thermal radiation.

What is the advantage of heat flux sensor compared to temperature sensors?

Heat flux sensors offer a higher resolution of temperature gradients than temperature sensors. Heat flux sensors enable dynamic measurements for an in-depth understanding of thermal systems.

How do heat flux sensors function?

Tiny, serially connected semiconductor piles inside the sensor generate a voltage, which is proportional to the heat passing through the surface. The voltage is read out and depending on the sensor 's sensitivity the results are converted into the heat flux.

What is the temperature range where gSKIN® Heat Flux Sensors function?

gSKIN® Heat Flux Sensors function in a temperature range of $-50^{\circ}C$ to $+150^{\circ}C$. The silicone encased gSKIN® (model XO) functions from $-40^{\circ}C$ to $+100^{\circ}C$. The silicone encasing ensures a good thermal coupling when measuring on rugged surfaces.

Does greenTEG offer customized heat flux sensors?

Yes, greenTEG can customize heat flux sensors to meet specific needs. Customization depends on the volume you intend to order. [Contact us](#) for questions regarding customization.

How do greenTEG's heat flux sensors compare to heat flux sensors of other manufacturers?

greenTEG's sensors are more sensitive and thinner than most commercially available heat flux sensors.

How do I choose the right heat flux sensor model?

This depends on your application. The larger the sensors surface, the higher the measurement resolution. Smaller sensors are easier to integrate. If you are unsure which sensor you should choose for your application, [contact us](#). We are happy to answer your questions.



Where are heat flux sensors typically applied?

The range of heat flux sensor applications is almost endless. The sensors can be used to characterize and improve materials, to monitor and control processes in industry, home appliances, and wearable technologies, or to monitor core body temperature to name a few examples. [Contact us](#) to discuss your application idea.

Can I measure thermal radiation with a gSKIN® sensor?

Yes, but you will need to coat the sensor's surface with a light absorbing coating. [Contact us](#) for further details.