



FAQ: Textile Thermal Properties Measurement

What is the best product for measuring thermal storage and the thermal conductivity of a material?

The gSKIN[®] U-Value KIT with XP Heat Flux Sensor has 2 temperature sensors, a data logger and a software, which can easily read out: heat flux, 2 temperatures and U-Value at the same time. Since the data logger is small, robust and can record data even at a sampling rate of 1sec for several days, it is well suited for textile field measurements.

Why are the gSKIN[®] Heat Flux Sensors better, than other available methods for measuring textile thermal properties on the market i.e. hot guarded plate method?

The sensors are very sensitive and have a small size allowing measuring thermal properties of also small samples. They are affordable in comparison to for example a standard guarded hot plate method, and can be used under real conditions, where you can directly mount them on the material or skin.

Which sensor is the most suitable for textile thermal properties characterization?

Depending on the size of your sample and the required accuracy we either recommend 4.4x4.4 mm XM Sensor, 10x10 mm XP Sensor, or 18x18 mm XI Sensor.

What kind of data acquisition tool do I need?

If you do not wish to use a data logger provided by greenTEG, you need a data logger which can resolve at least 1uV.

How do I integrate or attach the sensor to the textile material?

Best is to mount the sensor on/underneath the fabric by using either a double sided thermal tape from greenTEG (only valuable for smooth surfaces) or by a normal tape, which can be placed over the surface of the fabric. Make sure to use alcohol, isopropanol or acetone to remove the tape from the surface of the sensor. Never tear at the cable, because that can damage the contact of the sensor, which will break it.

How are the measurements performed?

Field measurements:

Mount the sensor at the desired spot on the fabric (better inside than outside) and mount the temperature sensors on the outside and the inside of the textile close to the heat flux sensor (for better understanding visit our website on [u-value measurements](#)). The human body act as a heat source.

Experiments in the lab:

Tape the temperature sensor to the surface of a hotplate and then place the material onto it. Attach the heat flux sensor and the second temperature sensor on the upper surface fabric. Then heat up the hot plate with a constant power resulting in a temperature 5°C to 10° above room temperature. Make sure, that the measurements are not disturbed by convection or radiation.