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gSKIN®

Heat Flux Sensors for Core Body Temperature

ADVANTAGES OF USING gSKIN® HEAT FLUX SENSORS FOR CORE BODY TEMPERATURE

- *Small sensors with high sensitivity, easily integrated into application setups*
- *Non-invasive, fast measurement technique with the potential to determine core body temperature*

REASEARCH AND DEVELOPMENT FOCUS AREAS FOR gSKIN® HEAT FLUX SENSORS

The Heat Flux Sensor Model has been tested and works under steady state conditions and at rest. Currently, greenTEG engineers are working on a prototype to determine:

- *An algorithm for Core Body Temperature and Skin Heat Flux*
- *Compensation of external conditions (radiation, wind, rain, thermal insulation, sweating)*
- *Fast equilibration time*

POTENTIAL APPLICATION AREAS FOR MONITORING CORE BODY TEMPERATURE

- *Performance optimization for athletes*
- *Monitoring inside incubators for prematurely born children*
- *Alerting people working in highly dangerous environments (Fire fighters, Miners, Soldiers)*
- *Sleep quality tracking*
- *Monitoring animal breeding*

SIMPLIFIED METHOD FOR MEASURING CORE BODY TEMPERATURE

1. *Install a gSKIN® Heat Flux Sensor and temperature sensor on the forehead.*
2. *Log the temperature and heat flux measurements (in Watts/m^2).*
3. *Determine the thermal resistance (in Kelvin/Watt/m^2) between the forehead and the core with the calibration measurement (assuming T_{core}= 37° C).*
4. *Calculate the temperature difference between the chest and core by using:*
   ΔT = (Heat Flux) x (Thermal Resistance)
5. *Calculate the temperature at the core by using:*
   $T_{Core} = T_{Skin} + \Delta T$