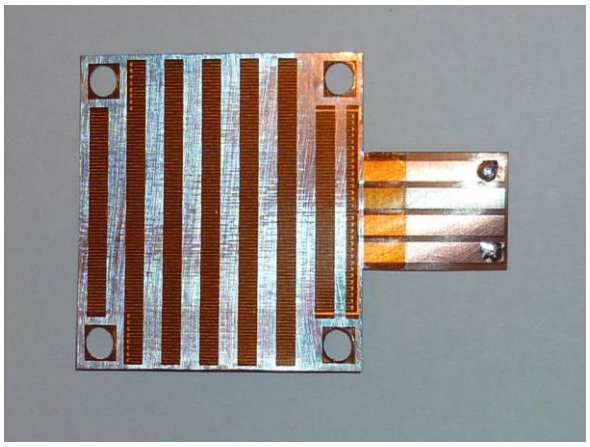
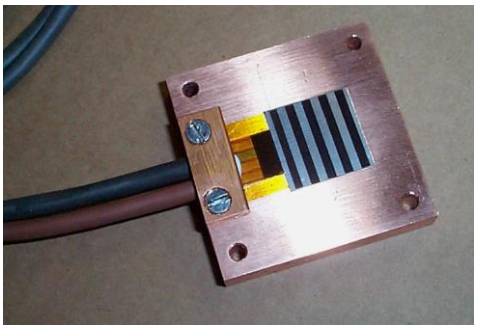
Captec Entreprise www.captec.fr

Radiant flux sensors Series

Thin foil radiant flux sensors



- For measuring radiant flux
- By using the sensitivity delivered with the sensor



- Rigid or Flexible
- Standard IR models
- Models solar + IR
- Models for visible radiation

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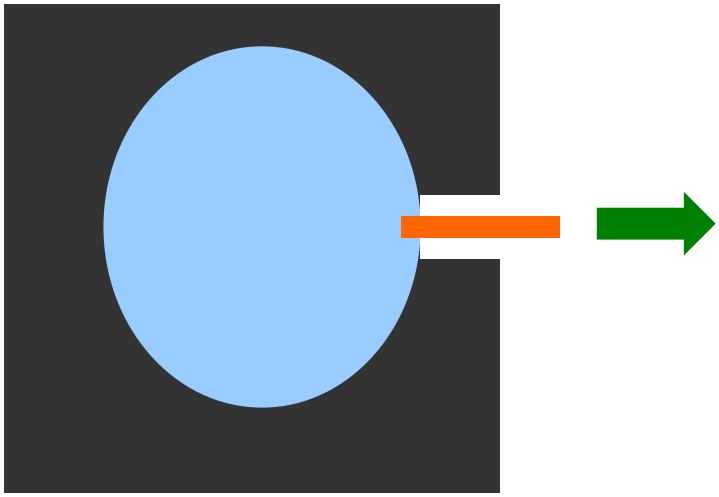

CAPTEC radiant flux sensors

- CAPTEC radiant sensors are devices of low thickness (0,3mm) stripped on their top side and copper coated on their back side. Their output meander comprises two connectors for the radiant flux output and two connectors for the built in T thermocouple output.
- They produce an output proportional to the net radiant flux into their sensing area whose temperature is separately measured by an incorporated thermocouple. Although heat flux into the sensing area can be convective, radiant or conductive, the sensor output is proportional to the net radiant flux into the sensing area measured in W/m^2.
- The device sensitivity is the mV response per kW/m^2 impressed across the sensing area kept at constant temperature.
- All sensors fabricated by CAPTEC are delivered with their sensitivity to radiant flux density. Since CAPTEC is not a 'certified lab', a COFRAC calibration can be delivered on request.
- Radiation absorption proportional to the emissivity of the stripped sensing area that causes variations of surface temperature is not involved in the sensor operation. The sensitivity to radiant flux does not depend on the emissivity of the sensing area.

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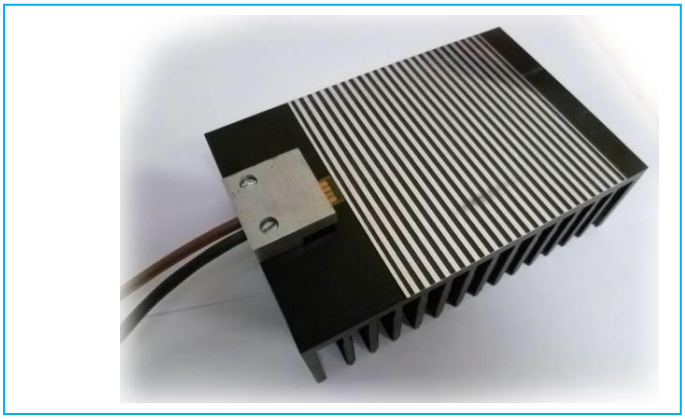

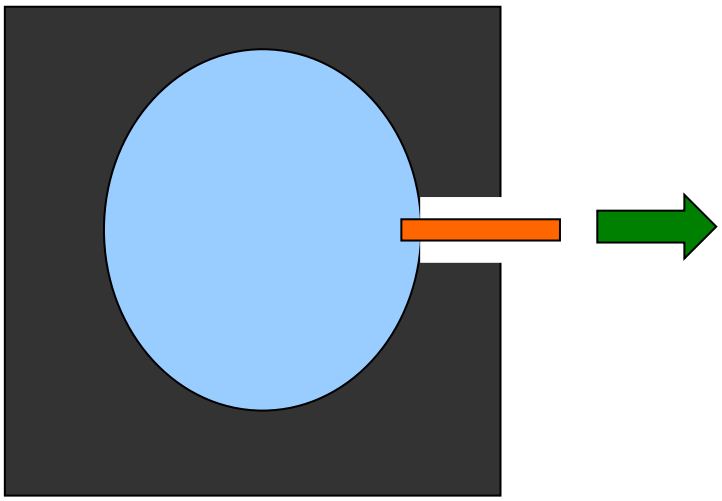

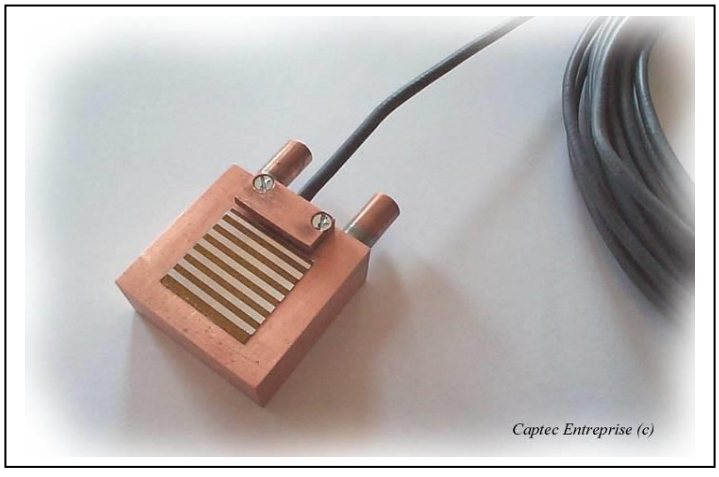

- Although the emissivity of standard models is nearly equal to 0,5, models of emissivity ranging between 0,2 and 0,8 are available with an unchanged sensitivity (kept to the nominal value)
- IR models are available for measuring radiant flux in the IR range; IR + solar models measure radiant and solar fluxes with the same sensitivity. Solar radiation sensors are also available.
- Radiant flux is simply determined in W/m^2 by dividing the output voltage by the sensitivity delivered with the sensor.
- Larger the sensing area, larger the sensitivity (nearly 0, 5 $\mu V/W/m^2$ for each additional square cm^2 of sensing area). The important problem encountered in practice is thus to determine how large must be the sensor area for accurately measuring an expected radiant flux or a minimum detectable radiant flux.
- The output voltage varies lineary versus radiant flux and so sensitivity (measured in $\mu V/W/m^2$) is a constant within a large range extending from a fraction of W/m^2 to several hundreds of kW/m^2.
- Since the sensor output is produced at the temperature of the sensing area, there is no temperature drift of sensitivity; CAPTEC radiant flux sensors are used within a large temperature range extending from cryogenic temperature up to 300°C; (200°C for standard devices).

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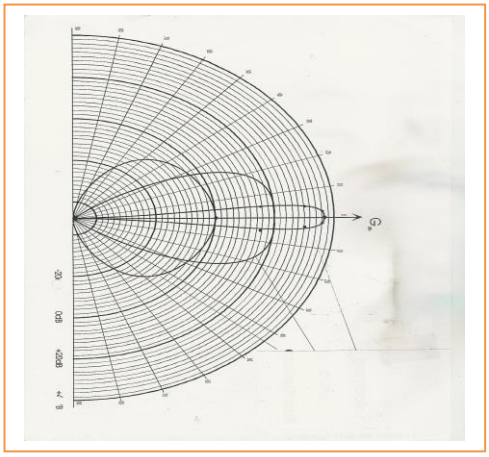

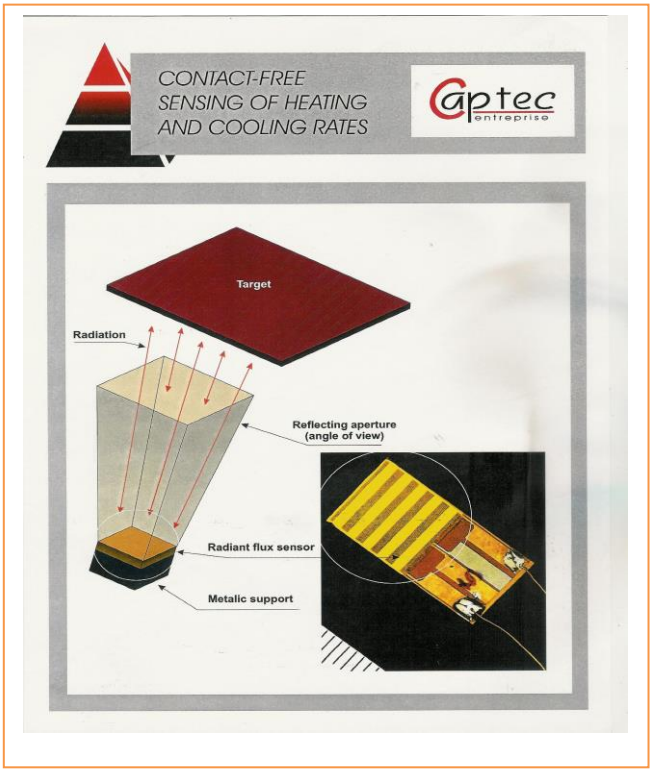

- Measuring radiant flux with no intermediary temperature differences leads to cancel the thermal noise that is a fundamental limit to radiant measurements.

- SPECIFICATIONS

- Ultrathin: Thickness of 0.3 mm

- Averaged emissivity of the sensing area: 0,5

- Operating temperature: from cryogenic temperatures to 200°C for standard models, to 300°C for high temperature models

- ADVANTAGES

Easy to use: simply connect the terminals to a millivolt meter or a microvolt meter.

Custom tailored for better fit**:** Size and shape possibilities are unlimited. Sensors as large as 300*300mm, as small as 5*5mm are available.

Integral temperature sensor: CAPTEC can furnish heat flux sensors with integral T thermocouple built in the sensing area.

Ultrathin and low response time: response time lower than 50ms (63%).

- **Low electric resistance:** lower than 500 Ohm per dm^2

- Application as thermal emissivity tester

The radiant flux sensor mounted onto the bottom plate measures radiant flux $\varphi = \varepsilon\sigma (T^4_2 - T^4_1)$ is proportional to the emissivityε of the upper plate. The plates temperature are kept to constant values so that the output voltage can be calibrated versus emissivity.