

## Press release

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*Delft, January 10, 2019:*

### **Hukseflux introduces the Hot Cube human thermal comfort measuring system - a new, innovative tool for automotive testing and research and education.**

Hukseflux Thermal Sensors, market leader in heat flux measurement, has released the TCOMSYS01 system. It measures human thermal comfort according to the new Hot Cube method. Its application in automotive testing seems logic - Hukseflux was recently voted Automotive Supplier of the Year - but there is more.

TCOMSYS01 is a measuring system to help understand and quantify "causes and effect" leading to human thermal comfort. The included TCOM01 body is temperature stabilised at 33 °C, so that it offers a relatively direct measurement of the human experience. In essence, TCOM01 is a miniature thermal mannequin, measuring according to the innovative Hot Cube method. The heater power required to keep the TCOM01 at a constant temperature is the main measurand. Incorporating 5 heat flux sensors with a black absorber, it also offers a detailed picture of the heat gain and loss from different directions, and a good indication of convective and radiative asymmetry. Other measurements are sensor body temperature, air temperature and relative humidity. In its standard configuration, the system consists of an MCU (Measurement and Control Unit) and a TCOM01 sensor on a tripod. The MCU offers direct connection to any local area network and "Ethernet over USB". TCOM01 is also available as a sensor only.

Already in 1929 the Eupatheoscope (from Greek "wellbeing-emotion-examination") was designed by A.F. Dufton to quantify the condition in a room from the point of view of comfort. It consists of a blackened cylinder which is controlled to maintain a temperature of 23 °C. The power used is interpreted in terms of equivalent temperatures. In the 1990's, the company Bruel & Kjaer carried a thermal comfort meter (model 1212), based on the same principle, and in addition processing Fangers equation. Both models involved only an integrated power measurement. The new Hot Cube method improves on this by incorporating omnidirectional heat flux measurements.

TCOMSYS01 is small enough to work in confined environments such as the passenger compartment of a car. Besides applications in the automotive industry, there are more usage examples of the Hot Cube system:

- surveys of human thermal comfort
- studies of the effect of radiating sources
- workplace investigations
- educational purposes, illustrating heat transfer
- bio-meteorology
- microclimate studies
- wind-chill analysis
- analysis of fabric insulation

### **About Hukseflux**

Hukseflux offers measurement solutions for the most challenging applications. Its main area of expertise is measurement of heat transfer and thermal quantities such as solar radiation, heat flux and thermal conductivity. The company, based in Delft, the Netherlands, designs and supplies sensors as well as test & measuring systems, and offers related services such as engineering and consultancy. The complete product range of Hukseflux sensors and systems is offered worldwide.

Hukseflux offers a full range of sensors, systems and services to the automotive industry and was voted "Automotive Supplier of the Year" at the recent Automotive Thermal Management International Forum in the U.K. Besides heat flux measuring equipment, also Hukseflux' pyranometers, measuring solar radiation, are in use by the world's most advanced car manufacturers.

The images show the new [TCOMSYS01 Hot Cube](#) thermal comfort measuring system on display and in a car. For 'solar soak' and other heat and solar radiation tests, [pyranometers](#) are usually mounted on the car.

### **Hukseflux Thermal Sensors B.V.**

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*Please find attached a selection of images to be used freely with the press release.*



**Image 0.1** *TCOMSYS01 Hot Cube thermal comfort measuring system – a new tool for research and education*



**Image 0.2** TCOM01 mannequin applied in car passenger comfort testing



**Image 0.3** Example of a pyranometer, model SR30-D1, applied in automotive testing