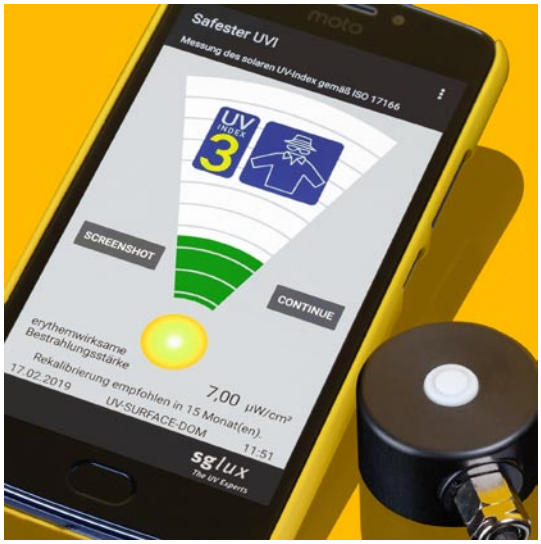
Safester UVI

Radiometer for risk assessment of solar UV radiation according to ISO 17166

PROPERTIES OF THE SAFESTER UVI



The Safester UVI is used for the risk assessment of solar UV radiation. The device determines the UV index defined by the WHO [1] according to ISO 17166 [2]. It displays the weighted, erythema-effective radiation in µW/cm² as well as the UV index calculated from this according to the standard. Pictograms recommend adapted protective measures according to the WHO recommendation depending on the UV index. The Safester UVI consists of a calibrated sglux sensor of the type „UV-Surface_UVI“ and a smartphone with corresponding software. The input optics of the sensor unit consists of a cosine corrected diffuser that detects radiation from the entire upper sky half-space. The core of the sensor is a silicon carbide (SiC) semiconductor diode.

SiC semiconductor diodes are sensitive only to radiation components from the UV range and not from the visible or infrared spectral range, which together account for more than 95 % of total solar radiation. The diode is preceded by an optical filter with optimal adaptation to erythema action curve [3]. Radiation components that do not contribute to the UV index are suppressed. The interaction of the optical components results in the UV index as the measured value. The measurement uncertainty of the Safester UVI is less than ± 6 % for UVI values smaller than 8 and less than ± 3 % for UVI values larger than 8 [4,5]. The technical data for the sensor „UV-Surface_UVI“ can be found from page 3 of this data sheet.

SETUP, FUNCTIONS AND MAINTENANCE OF THE SAFESTER UVI

Connect the sensor to the USB input of the smartphone and switch on the smartphone. The app for measuring and displaying the measured values starts automatically. The display of the continuously measured UVI can be paused using the hold button. The screenshot function saves the currently visible information as a photo in the device.

Despite its robust design, the Safester UVI is a sensitive measuring instrument. The sensor should especially be protected from falls and its entry window should be kept clean. Depending on the intensity of use, recalibration is recommended every 2-3 years. This can be done in our calibration laboratory.

HOW TO DO A MEASUREMENT

For UV index measurements, the Safester UVI is usually operated in a location where the sensor is not affected by shading from trees or buildings or reflections from reflective surfaces. An ideal location is an elevated place where the entire horizon is freely visible. Here the sensor is aligned horizontally and the measurement is carried out. According to standard's requirements, the sensor must not be aligned to the sun. It is also possible to use the device under the shade of trees, e.g. to determine the UV index in parks, or to use it under sunshades to measure the protective effect.

ABOUT THE UV-INDEX

The Safester UVI shows the UV index in numbers and with colored background on the display. The colors correspond to the specifications of the WHO, which gives the following recommendations for action for the various measured values [1]:

UV-Index 1-2	low UV-Index	No protection needed. You can safely stay outside.
UV-Index 3-5	moderate UV-Index	Wear a shirt and a hat and use sunscreen.
UV-Index 6-7	high UV-Index	Seek shade during late morning though mid-afternoon. When outside, generously apply broad-spectrum SPF-15 or higher sunscreen on exposed skin, wear protective clothing, a wide-brimmed hat, and sunglasses.
UV-Index 8-10	very high UV-Index	Extra protection is needed. If your shadow is shorter than you, seek shade and wear protective clothing, a wide-brimmed hat, and sunglasses, generously apply broad-spectrum SPF-15 or higher sunscreen on exposed skin.
UV-Index 11	extreme UV-Index	Avoid being outside.

The UVI displayed is the current measured value, which changes when measurements are taken over the course of the day. The displayed recommendation for action applies to the respective time of measurement. In contrast, UVI predictions indicate the daily maximum value.
It is recommended to carry out several measurements daily, even at the sun's peak, in order to be able to take the appropriate protective measures in each case.

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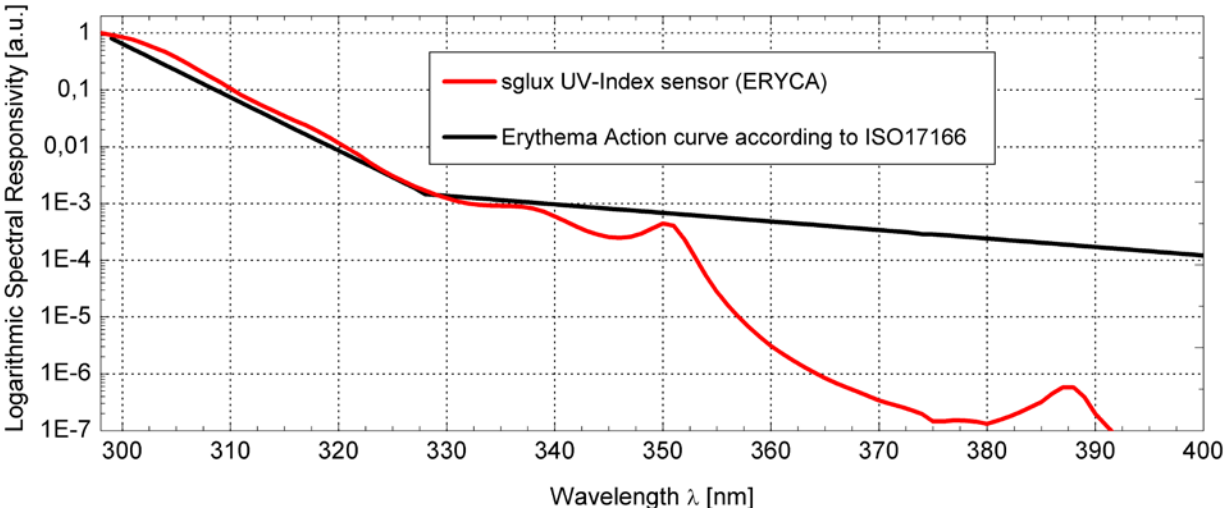
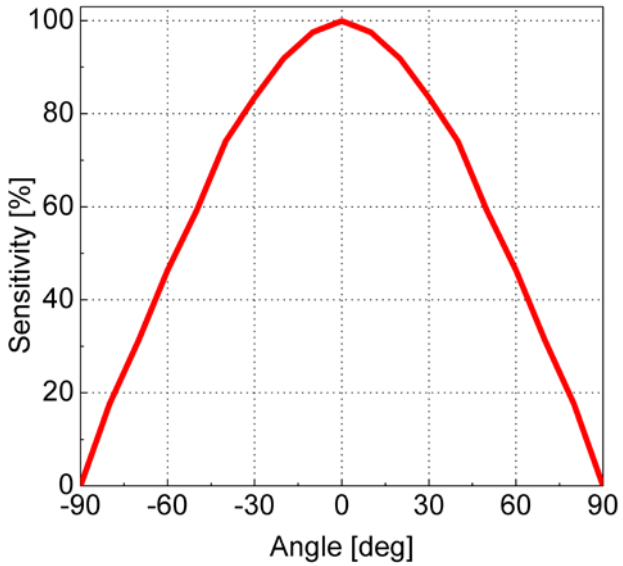
SPECIFICATIONS

Function	Broadband radiometer for the determiation of the UV-Index
Properties	Battery powered radiometer consisting of a UV-Index sensor (SiC-photodiode with filter according to the Erythema action curve) and a smartphone
Measuring range	Wavelength: 290 nm ... 390 nm UV-Index: 0 ... 25 = erythemal irradiation intensity: 0 ... 625 mW/m²
Input optics	cosine corrected diffusor with 11 mm diameter
Photodiode	SiC photodiode with filter
Calibration	PTB traceable calibration
Measurement uncertainty	<= UVI 2 ± 12%, >UVI 2: ± 6%, >UVI 8: ± 3%
Interface	USB 2.0
Temperature range	-5°C ... +45°C
Power supply	from smartphone via USB
Weight	260 g (sensor and smartphone)

SPECTRAL RESPONSIVITY OF THE SENSOR "UV-SURFACE_UVI (ERYCA)"



FIELD OF VIEW OF THE SENSOR "UV-SURFACE_UVI (ERYCA)"



LITERATURE

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2. ISO 17166:1999(en), https://www.iso.org/obp/ui/#iso:std:iso:17166:ed-1:v2:en

3. McKinlay AF, Diffey BL, A reference action spectrum for ultraviolet induced erythema in human skin.CIE J 1987; 6: 17-22.

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