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Exposure at 254 nm of UV-sensitive material

Identification

Object	Three yellow samples of UV-sensitive material, denoted “Standard”, “-50” and “+50”.
Object state	Upon arrival the objects had no visual damage and were without any colour changes.
Location	Borås
Measurement date	Apr 21, 2016

Measurement methods and procedures

Each sample was exposed by UV-radiation at 254 nm wavelength using a UVP Transilluminator equipped with fluorescent UVC-tubes. The irradiation level at the sample plane was determined by a calibrated silicon detector with a precision aperture in front of the detector’s photosensitive surface. In order to be able to compare the exposed part of the sample with the non-exposed, an aperture was used to limit the exposure to a well-defined spot of about \varnothing 10 mm on the sample.

At certain times corresponding to exposure levels of 10000, 36000 and 50000 $\mu\text{J}/\text{cm}^2$, the exposure was briefly paused and a picture of the sample was taken with the masking aperture temporarily removed. All pictures were taken in a light both using illumination with high colour rendering index (> 95) using a Nikon camera with fixed settings. Finally the small colour shifts still occurring between each individual picture were fine-tuned so that the non-exposed part of each sample matched.

Measurement conditions

Ambient temperature	23 \pm 2 °C
Sample temperature (during exposure)	34 \pm 3 °C
Exposure wavelength	254 \pm 2 nm

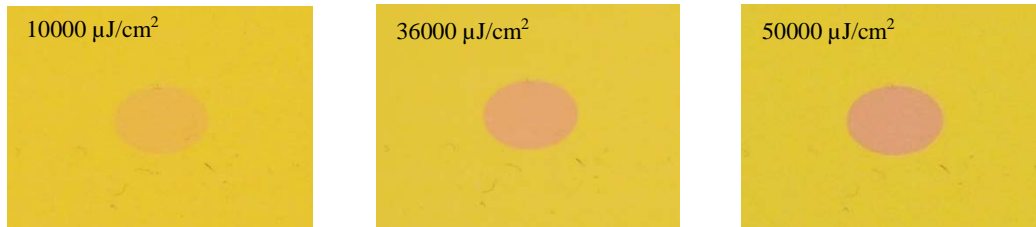
Results

The results only refer to the objects specified in this document.

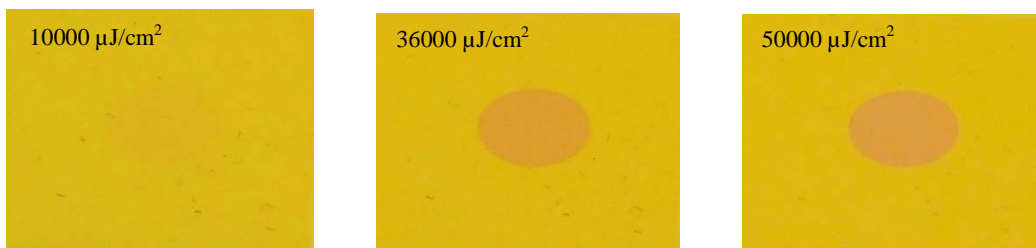
The exposure irradiance was 35 – 45 $\mu\text{W}/\text{cm}^2$ corresponding to exposure times of about 18 – 24 minutes in order to reach 50000 $\mu\text{J}/\text{cm}^2$.

Below the colour shift for each sample after exposure at 254 nm is presented.

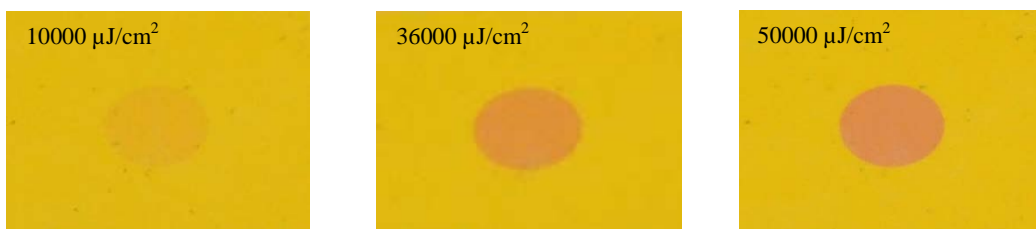
Sample “Standard”:



Sample “-50”:



Sample “+50”:



The uncertainty is estimated to ± 5 % of the reported exposure levels.

Equipment

Reference silicon detector 10×10 mm, SP inv.no. 500963
UVP Transilluminator 254 nm, no. 95-0153-02
Picoammeter Keithley 6485, SP inv.no. 603159
Precision aperture \varnothing 8 mm, SP inv.no. 502607
Light booth True Color TC-60
Nikon Coolpix P300 digital camera

**SP Technical Research Institute of Sweden
Measurement Technology - Time & Optics**

Performed by

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