## TECHNICAL RELEASE <br> LUZCHEM EXPOSURE STANDARD: LEDi-680

General information: Luzchem Research, Inc. produces and freely distributes exposure standards as a service to scientists involved in research in photochemistry, photobiology and photostability. These standards are available in Luzchem's website for reference. They can be used to characterize conditions of exposure and should allow other scientists to readily replicate irradiation conditions. Measurements were made using a calibrated Ocean Optics USB4000 spectrometer (calibration valid until December 2021). To the best of our knowledge spectral information is accurate within the experimental resolution of $\pm 2 \mathrm{~nm}$. For more information concerning the procedure used to obtain this data, please consult tech@luzchem.com

| Lamp Part Number | LEDi-690 | Measurement Temperature | $25^{\circ} \mathrm{C}$ |
| :--- | :--- | :--- | :--- |
| Description | 7 Red LEDs | Measurement date | December 11, 2020 |
| Measurement distance | $\sim 3.8 \mathrm{~cm}$ lamp to target | Monitored range | 300 to 850 nm |
| FWHM $(\mathrm{nm})$ | 22 | FWHM peak range ${ }^{(1)}$ | $681-703 \mathrm{~nm}{ }^{(2)}$ |

${ }^{(1)}$ As output current is adjusted the peak wavelength can vary within the resolved peak range specified above with an additional $\pm 5 \mathrm{~nm}$ margin of error (information provided by LED manufacturer).
${ }^{(2)}$ FWHM based on power at $50 \%$ of value at maximum.


Power ${ }^{(3)(4)}$

| Total Power in Visible Region $(400-800 \mathrm{~nm})$ | $\mathrm{W} / \mathrm{m}^{2}$ | 13,800 |
| :--- | :--- | ---: |
| Total Power under main peak $(653-718 \mathrm{~nm})^{(5)}$ | $\mathrm{W} / \mathrm{m}^{2}$ | 13,300 |
| Estimated dose for a cuvette with $2 \mathrm{~cm}^{2}$ exposure area | Watts | 2.76 |

${ }^{(3)}$ Power measured at maximum output available for LEDi-HRD. Power output of individual units may vary $\pm 10 \%$;
${ }^{(4)}$ Conversion factor for $\mathrm{W} / \mathrm{m}^{2}$ to $\mathrm{W} / \mathrm{cm}^{2}$ : divide by 10,000 .
${ }^{(5)}$ Based on power exceeding $5 \%$ of maximum spectral irradiance.

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