

# Package ‘photobiologyLEDs’

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**Type** Package

**Title** Spectral Data for Light-Emitting-Diodes

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**Description** Spectral emission data for some frequently used light emitting diodes.

**License** GPL (>= 3)

**VignetteBuilder** knitr

**Depends** R (>= 3.2.0), photobiology (>= 0.9.11)

**Suggests** knitr (>= 1.14), photobiologyWavebands (>= 0.4.1), ggspectra (>= 0.1.10), ggplot2 (>= 2.1.0)

**LazyLoad** yes

**LazyData** yes

**ByteCompile** true

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**URL** <http://www.r4photobiology.info>,  
<https://bitbucket.org/aphalo/photobiologyleds>

**BugReports** <https://bitbucket.org/aphalo/photobiologyleds/issues>

**RoxygenNote** 5.0.1

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photobiologyLEDs-package

*Spectral Data for Light-Emitting-Diodes*

---

**Description**

Spectral emission data for some frequently used light emitting diodes.

**Details**

Data for emission spectra of different types of LEDs.

The package contains one collection of spectra for different leds all of them measured at room temperature and a series of vectors to be used as indexes to extract different subsets of spectra. These spectral data are normalized to spectral energy irradiance equal to one at the wavelength of maximum spectral energy irradiance (strongest emission peak).

**Warning!**

None of the spectral data included in this package are based on supplier's specifications and are only for information. The exact emission spectrum depends to some extent on testing conditions, but more importantly among individual LED dies. Spectral specifications are usually given by typical and boundary values. Furthermore, most manufacturers classify LEDs of a given type into "bins" with slightly different optical and electrical characteristics. In other words, the data provided here are not a substitute for actual measurements of radiation emission and spectrum of the LEDs actually used in a given piece of scientific research. For less demanding situations the data are in most cases reliable enough but perfect agreement with measurements on other LEDs of the same exact type should not be expected.

**Examples**

```
library(photobiology)
library(photobiologyWavebands)
names(leds.mspct)
q_ratio(leds.mspct$white, Blue(), Red())
q_ratio(leds.mspct$Q36_4000K, Blue(), Red())
```

---

hewlett\_packard

*Spectral data for LEDs array supplied by Agilent/Hewlett Packard*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for the NHXRGB0905005 light emitting diodes (LEDs) arrays from Osram. Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
hewlett_packard
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad ( $\text{W m}^{-2} \text{nm}^{-1}$ )

**Note**

The division of Hewlett Packard which supplied these LEDs became part of Agilent when this division spin-off the mother company. More recently the electronic components division of Agilent became Avago Technologies which still supplies some of these LEDs or similar improved types.

<http://www.avagotech.com/>

**Examples**

```
hewlett_packard
leds.mspct[hewlett_packard]
```

---

`huey_jann`*Spectral data for LEDs array supplied by Huey Jann*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for different light emitting diodes (LEDs) arrays from Huey Jann Electronics Industry Co., Ltd. (Taiwan). Absolute values are not meaningful as the measuring distances are variable, and in most cases unknown.

**Usage**`huey_jann`**Format**

A vector of character strings.

**Details**

The variables are as follows:

- `w.length` (nm)
- `s.e.irrad` ( $\text{W m}^{-2} \text{nm}^{-1}$ )

**Note**

Huey Jann was a Taiwanese supplier of LED array. It is no longer in business.

**Examples**

```
huey_jann
leds.mspct[huey_jann]
```

---

`leds.mspct`*Spectral irradiance for diverse LEDs*

---

**Description**

A collection of emission spectra of light-emitting-diodes from different suppliers.

**Usage**`leds.mspct`

**Format**

A "source\_mspct" object containing several "source\_spct".

**Details**

The "source\_mspct" object contains "source\_spct" objects with spectral emission data.

The variables in each member spectrum are as follows:

- w.length (nm)
- s.e.irrad (relative energy based units)

**Note**

Please see the help corresponding to each supplier for details.

**See Also**

[oo\\_maya\\_leds](#)

**Examples**

```
names(leds.mspct)
leds.mspct$UV395
```

---

leds\_global

*Spectral data for LEDs array supplied by Shenzhen Weili Optical*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for different light emitting diodes (LEDs) arrays from Shenzhen Weili Optical Ltd. Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
leds_global
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad (W m<sup>-2</sup> nm<sup>-1</sup>)

**Note**

Leds Global and Shenzhen Weili are trade names of the same supplier of LED arrays. They sell both standard types and also assemble customized arrays upon request. Customized arrays may have up to five independent channels.

<http://www.leds-global.com/>

**Examples**

```
shenzhen_weili  
leds_global  
leds.mspct[leds_global]
```

---

led\_engin

*Spectral data for LEDs array supplied by Led Engin*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) and arrays from Led Engin (USA). Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
led_engin
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad (W m<sup>-2</sup> nm<sup>-1</sup>)

**Note**

Led Engin is a supplier of power LEDs of high efficiency. <http://www.ledengin.com/>

**Examples**

```
led_engin  
# leds.mspct[led_engin]
```

---

`lumitronix`*Spectral data for LED array from LUMITRONIX*

---

**Description**

Dataset containing the wavelengths and tabulated values spectral emittance for a high power light emitting diode (LED) array from LUMITRONIX based NICHIA's high efficiency natural white SMT LEDs. Specifications: LUMITRONIX SmartArray Q36 LED-Module, 4247 lm, 4000K, 39W electrical. Data are normalized to one at the wavelength of maximum emission.

**Usage**`lumitronix`**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad ( $W\ m^{-2}\ nm^{-1}$ )

**Note**

Lumitronix is a supplier of LED arrays, and a distributor of LEDs. <http://www.leds.de/>

**Examples**

```
lumitronix
leds.mspct[lumitronix]
```

---

`norlux`*Spectral data for LEDs array supplied by Norlux*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for the NHXRGB0905005 light emitting diodes (LEDs) arrays from Norlux (USA). Data are normalized to one at the wavelength of maximum emission.

**Usage**`norlux`

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad (W m<sup>-2</sup> nm<sup>-1</sup>)

**Note**

Norlux is now part of Thomas Research Products. <http://www.trpssl.com/>

**Examples**

```
norlux  
leds.mspct[norlux]
```

---

oo\_maya\_leds

*Spectra acquired with Ocean Optics Maya2000 Pro*

---

**Description**

Dataset containing the wavelengths and tabulated values spectral emittance for LEDs. Data for both low power single-die devices and high power LEDs arrays are included. The data are normalized to the peak of maximum spectral energy irradiance.

**Usage**

```
oo_maya_leds
```

**Format**

A vector of character strings.

**Details**

oo\_maya\_leds is a character vector with indexes to members of `leds.mspct`.

The variables in each member spectrum are as follows:

- w.length (nm)
- s.e.irrad (relative energy based units)



**Note**

Instrument used: Ocean Optics Maya2000 Pro single-monochromator array spectroradiometer with a Bentham cosine corrected input optics. A complex set of corrections and calibration procedure used. Raw spectral data processed with R packages 'MayaCalc' or 'ooacquire'. The `source_spct` object contains a comment with additional information on the measurement and data processing. Measurements done by Pedro J. Aphalo.

**Examples**

```
oo_maya_leds
leds.mspct[oo_maya_leds]
leds.mspct[["white"]]
leds.mspct$white
```

---

osram

*Spectral data for LEDs array supplied by Osram*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for the NHXRGB0905005 light emitting diodes (LEDs) arrays from Osram. Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
osram
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- `w.length` (nm)
- `s.e.irrad` ( $\text{W m}^{-2} \text{nm}^{-1}$ )

**Note**

Current trade name is Osram Opto Semiconductors <http://www.osram-os.com/>

**Examples**

```
osram
leds.mspct[osram]
```

---

quantum_devices	<i>Spectral data for LEDs array supplied by Quantum Devices</i>
-----------------	-----------------------------------------------------------------

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) from Quantum Devices (USA). Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
quantum_devices
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad (W m<sup>-2</sup> nm<sup>-1</sup>)

**Note**

Quantum Devices produces both individual LEDs and luminaires. <http://www.quantumdev.com/>

**Examples**

```
quantum_devices  
leds.mspct[quantum_devices]
```

---

roithner_laser	<i>Spectral data for LEDs supplied by Roithner Laser</i>
----------------	----------------------------------------------------------

---

**Description**

Datasets containing the wavelengths and tabulated values for spectral emittance for different light emitting diodes (LEDs) and LED arrays supplied by Roithner Laser (Austria). Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
roithner_laser
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad ( $\text{W m}^{-2} \text{nm}^{-1}$ )

**Note**

Roithner LaserTechnik is a distributor and reseller of LEDs, LED arrays and lasers. They have a very extensive catalogue covering almost wavelengths for which LEDs are manufactured. <http://www.roithner-laser.com/>

**Examples**

```
roithner_laser  
leds.mspct[roithner_laser]
```

---

seti

*Spectral data for LEDs array supplied by SETi*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for the NHXRGB0905005 light emitting diodes (LEDs) arrays from Osram. Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
seti
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad ( $\text{W m}^{-2} \text{nm}^{-1}$ )

**Note**

SETi (Sensor Electronic Technologies) is a supplier of high power ultraviolet LEDs emitting in the UVC, UVB and UVA regions of the spectrum. Many of these LEDs are also sold under different type denominations by Roithner LaserTechnik. <http://www.s-et.com/>

**Examples**

```
seti
leds.mspct[seti]
```

---

tao\_yuan

*Spectral data for LEDs supplied by TaoYuan*

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for different light emitting diodes (LEDs) from TaoYuan Electron (HK). Data are normalized to one at the wavelength of maximum emission.

**Usage**

```
tao_yuan
```

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad (W m<sup>-2</sup> nm<sup>-1</sup>)

**Note**

TaoYuan Electron (HK) is a supplier of LEDs and LED arrays. <http://www.ledwv.com/en/>

**Examples**

```
tao_yuan
leds.mspct[tao_yuan]
```

---

unknown	<i>Spectral data for LEDs array of unknown manufacturer</i>
---------	-------------------------------------------------------------

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for different "generic" light emitting diodes (LEDs) without type specifications. Bought from shops like Class Ohlson or hobby targete electronic suppliers. Absolute values are not meaningful as the measuring distances are variable, and in most cases unknown.

**Usage**

unknown

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad ( $\text{W m}^{-2} \text{nm}^{-1}$ )

**Examples**

```
unknown  
leds.mspct[unknown]
```

---

uv_leds	<i>Spectral data for LEDs of different colors</i>
---------	---------------------------------------------------

---

**Description**

Datasets containing the wavelengths and tabulated values spectral emittance for the light emitting diodes (LEDs) from various suppliers. Data are normalized to one at the wavelength of maximum emission.

**Usage**

uv\_leds

**Format**

A vector of character strings.

**Details**

The variables are as follows:

- w.length (nm)
- s.e.irrad ( $\text{W m}^{-2} \text{nm}^{-1}$ )

**Examples**

```
uv_leds
blue_leds
green_leds
amber_leds
red_leds
white_leds
multichannel_leds
# select LEDs emitting in the amber, yellow, orange region
leds.mspct[amber_leds]
```

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