

KROPTEK LTD – LED LIGHT SPECTRUM KP4 (FULL SPECTRUM)

- CRI: Ra = 95+ (Colour Rendering)
- PPE (Photosynthetic Photon Efficiency): Efficacy of the luminaire ($\mu\text{mol}/\text{J}$)
- μmol (Micromoles): Quantity of photons
- J (Joule): Power per second (W/s)
- Efficiency: %
- Efficacy: $\mu\text{mol}/\text{J}$ (quantity of photon per power)
- PPF (Photosynthetic Photon Flux): quantity of photons emitted per second ($\mu\text{mol}/\text{s}$)
- PAR (Photosynthetic Active Radiation): Wavelengths of range 400-700nm
- PPFD: Quantity of photons received in an area ($\mu\text{mol}/\text{m}^2/\text{s}$)

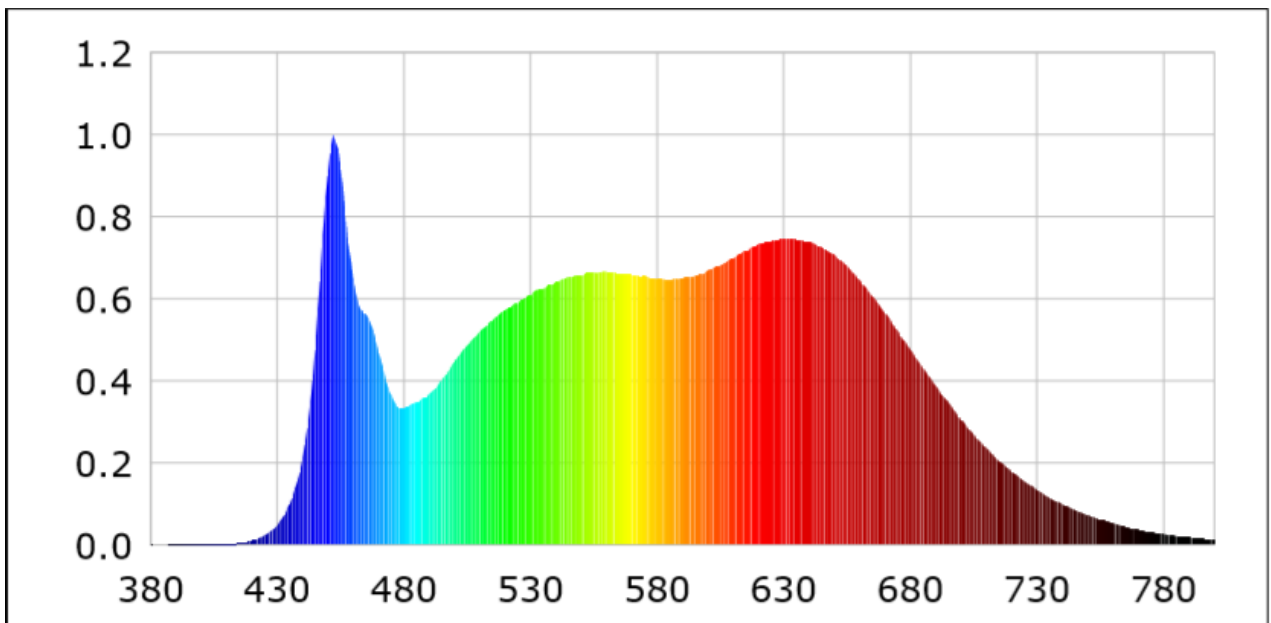
Kroptek Light specs:

| | | |
|-----------|-------------------------------------|-----------------------------------|
| Sunstream | - PPE: 2.2 $\mu\text{mol}/\text{J}$ | PPF: 550 $\mu\text{mol}/\text{s}$ |
| Sunblast | - PPE: 2.2 $\mu\text{mol}/\text{J}$ | PPF: 726 $\mu\text{mol}/\text{s}$ |
| iTube1200 | - PPE: 2 $\mu\text{mol}/\text{J}$ | PPF: 36 $\mu\text{mol}/\text{s}$ |
| iTube1800 | - PPE: 2 $\mu\text{mol}/\text{J}$ | PPF: 60 $\mu\text{mol}/\text{s}$ |
| HiKrop60 | - PPE: 1.8 $\mu\text{mol}/\text{J}$ | PPF: 108 $\mu\text{mol}/\text{s}$ |
| Hikrop180 | - PPE: 2 $\mu\text{mol}/\text{J}$ | PPF: 360 $\mu\text{mol}/\text{s}$ |

Example Sunblast-330:

Based on a spectrometer reading, our Sunblast 330 has a PPF= 686.583 $\mu\text{mol}/\text{s}$ and a Ra (CRI) = 96.1

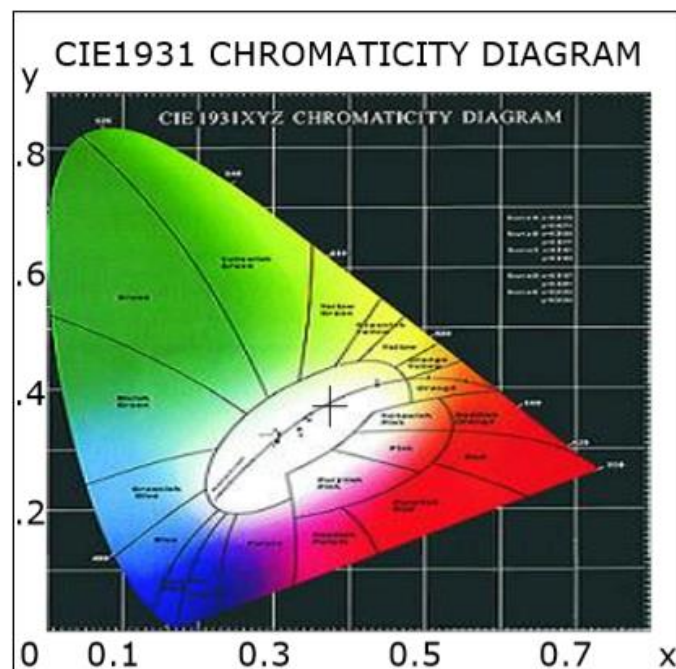
Kroptek KP04 Spectrum



This is our KP4 Spectrum – this is the various range of photons' wavelengths emitted from our lighting fixtures.

Very close to the sunlight spectrum, KP4 Spectrum is our closest white LEDs spectrum we designed to mimic the Sun's wavelengths. It is this spectrum, along with an appropriate layout of light fixtures, that will produce the best outcome for your plants.

Kroptek's KP4 spectrum, represented below on the CIE 1931 Chromaticity Diagram, is designed with white LEDs only. The cross represents the colour our spectrum looks like to the naked eye (Neutral White).



Further Explained:

We use the KP-4 Spectrum for all our fixtures as it is a proven spectrum ideal for nearly all cultivars of plants at different growth stages in all types of growing facilities. It has a very high CRI which is beneficial for human operations in the grow rooms, detection of diseases, crop colour changes or bugs, etc.

This spectrum has proved to exceed HPS plant growth in a like-for-like set up.

$\mu\text{mol}/\text{J}$ is the general unit for the efficacy of LED horticulture lighting

Our LED GROW lights are all white because we use our custom broad spectrum –Blue LED chip with bespoke phosphorus– which is different to a commercial White LED, as it includes a small amount of Ultraviolet and Infrared.

- **UV-A** (<400nm) = stress the plant a little = producing more oil
- **Deep Blue/Blue light** (400-500nm) = vital for the vegetation stage (Blue light = optimal for seed and clone development)
- **Green Light** = cells structure and photosynthesis (helps plant to absorb more light)
- **Orange/red light** (600-700nm) = vital for the flowering stage.
- **Infra-red** (>700nm) = increase production

Many of the spectrum wavelength ranges are visible to the naked eye (~ 400-750nm), but plants require wavelengths above and below the visual spectrum of light that includes deep blue/ultraviolet (<400nm) and far-red/infrared (>700nm).