SMART LIGHTING SYSTEM – UCD Lamp distributor.

UCD Q&A

Q: What does UCD mean?

A: UCD means Ultra Constant Discharge lamp.

Q: What is the difference between UCD lamp and ordinary discharge lamps?

A: UCD is an innovative light source developed by a Korean company whose name is Kaixen and now protected by its patents.

UCD was developed with the concept to provide hi-end performance by optimizing all the relevant technologies of discharge lamp design and manufacturing. Thus UCD produces constant lighting and results in superior energy efficiency and longer lifespan.

Q: What are the major features of UCD lamp comparing to ordinary discharge lamps?

A: Major features of UCD are;

- Energy saving up to 75% over traditional outdoor discharge lamps
- Very good classification for color rendering index up to 80 Ra
- Instant Turn-ON and Hot Re-strike after switch-OFF
- Doubled lifespan by Dual-bulb application (Average lifespan; 20,000h)

Q: What are the most outstanding points of UCD lamp?

A: Firstly, UCD provides outdoor HID(High intensity discharge lamp) performance with single incandescent bulb's energy consumption.

Secondly, UCD provides most natural white color by mixing all seven (7) rainbow colors. The quality of UCD light differs from the ordinary white light which is mixing only three (3) primary colors (Red, Green and Blue).

Q: How UCD can substitute LED lamps for outdoor application?

A: Based on the encouragement from Government, LED lamps have been implemented for street lighting and other outdoor applications. But due to its lack of light spreadability and high price burden, LED lighting could not prove the suitability for outdoor lighting (high power application).

As an alternative solution, UCD is welcome by providing better energy-saving

(consumes 50% of LED's) and excellent performance with reasonable price.

Q: What types of UCD lamp are available?

A: At the moment, 40W, 60W, 80W and 120W are available.

Based on modular structure, 80W type is made of two (2) 40W types and 120W type is made of two (2) 60W types.

Q: How the dual-bulb works?

A: As a unique feature and a patented application, UCD lamp has dual-bulb structure having primary bulb and standby bulb in each lamp unit. The primary bulb is operated first and the standby bulb automatically takes over in case the primary bulb reaches end of life or becomes failed to produce light. The operation is automatically controlled by UCD ballast.

Q: What is the lifetime of UCD?

A: The actual lifespan differs depending on the conditions of installation site.

The average lifespan of each UCD bulb is 10,000 hours and therefore the total lifespan of dual-bulb becomes 20,000 hours.

(As a standard industry practice, Philips specifies that the lifespan is based on at least 50% survival rate.)

Q: What is the guideline for existing lamp replacement with UCD?

A: The basic guideline for UCD lamp replacement is as follows;

Type	Unit	Hi-pressure Sodium Lamp				Metal Halide Lamp							
Existing	W	400	250	150	100	400	350	250	200	175	150	100	70
UCD	W	120	80	60	40	120	120	80	80	80	60	40	40

The visibility as a total performance after replacement will be same or better.

Q: What is the application scope of UCD?

A: As an energy-saving lamp, UCD can be applicable for both indoor and outdoor lighting applications. The performance and feasibility of UCD can be much appreciated

for outdoor lightings and hi-bay lighting for big indoor space.
But due to price factor, UCD may be less feasible for ordinary room lighting.

Q: What are the appreciating points of UCD by customers?

A: The common points are;

- The light is surprisingly bright considering the power consumption (Wattage).
- It really saves the electric power cost.
- The light is near to the natural sunlight.
- The lighting is so comfortable.
- It is convenient to switch OFF and ON again with instant re-strike. It does not need to wait long time to get stabilized and to cool down after switch-OFF like traditional discharge lamps.
  For example, CosmoWhite(Philips) has following specification.

Run-up time[2]	Minutes	5
Re-ignition time	Minutes	15

The specific points are;

- It is good to have brighter lighting and best color rendering for production efficiency and process control in factories and workshops.
- UCD was the only outdoor lamp lighting during severe cold weather time in Russia.

Q: What is the color temperature of UCD?

A: 4,300 Kelvin (warm white) and 5,000 Kelvin (cool white) are available.

Q: Is UCD eco-friendly?

A: Yes, UCD has only a fraction of Mercury, 0.0054mg in the arc tube, which is far below than the international regulation. (HPS contains 30mg, Metal Halide lamp contains 6mg, and CFL 5mg)
UCD got eco-friendly certificate from RoHS.

Q: What kinds of safety approvals and international certificates did UCD receive?

A: UCD has various approvals and certificates as follows;

- Korean Electrical Appliance Safety Certificate
- Korean Government announcement on Hi-efficiency Lamp

- UL Certificate
- CE Certificate
- RoHS against Hazardous Substances

Q: What was the news about health hazard of LED?

A: A French public institute reported that LED lamp would cause some health problem. The article is quoted as follows;

"Watchdog safety alert on LED light October 26, 2010

PARENTS have been warned to keep young children away from areas lit by new-style light-emitting diode (LED) lights and to avoid toys that use the lamps.

Public health watchdog Anses has just completed first tests on the lights, which are starting to be increasingly used in many different applications, and says it found that some were not suitable for public use.

Now they are used as car running lights, billboards, kitchens and on TVs.

Anses tested nine types of LED lights against the IEC 62471 standards and rated three in the second-highest risk band.

It says the intense blue-white light is a "toxic stress" on the retina, with a severe dazzling risk. Youngsters are particularly sensitive to this risk as their eyes are still developing and the lens is not capable of filtering out the light wavelengths.

Anses that the intensity of LED lights should be reduced and public use restricted to lamps that give off the same intensity as traditional ones. High-intensity LED lamps should be for professional use only. "

Q: What about the lumen depreciation of UCD lamp?

A: Among white colored light sources, UCD has superior characteristic comparing to other types of Metal Halide lamp.

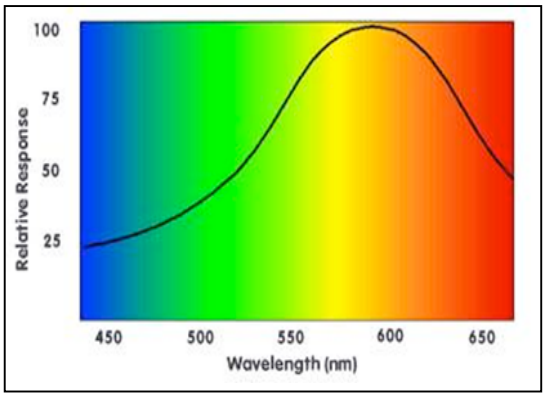
Q: What is the operating principle of UCD lamp?

A: UCD lamp is the most advanced discharge lamp which produces light by means of an electric arc between tungsten alloyed electrodes housed inside a quartz arc tube. The arc tube is filled with mixed gases and metal components. The gas facilitates the arc's initial strike with high voltage from the ballast. Once the arc is started, it heats and evaporates the metal components forming plasma which increases the intensity of light produced by the arc and reduces its power consumption. The discharging status is

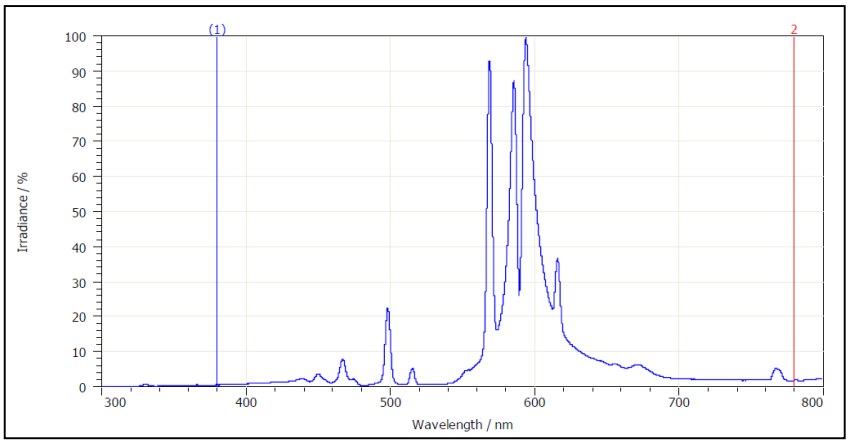
monitored and controlled by the intelligent ballast for constant discharge.

Q: The lighting of Hi-pressure Sodium lamp looks darker than that of UCD lighting. Why sometimes is the Lux reading of HPS surprisingly higher than UCD's?

A: In the visible light spectrum (400~700nm), the 550 to 650nm wavelength spectral region (yellow and orange) is where the sensitivity level of the human eye is highest. (Refer to the below figures.)



The spectrum of HPS mainly generates that yellow-orange colored light as shown below spectrum.



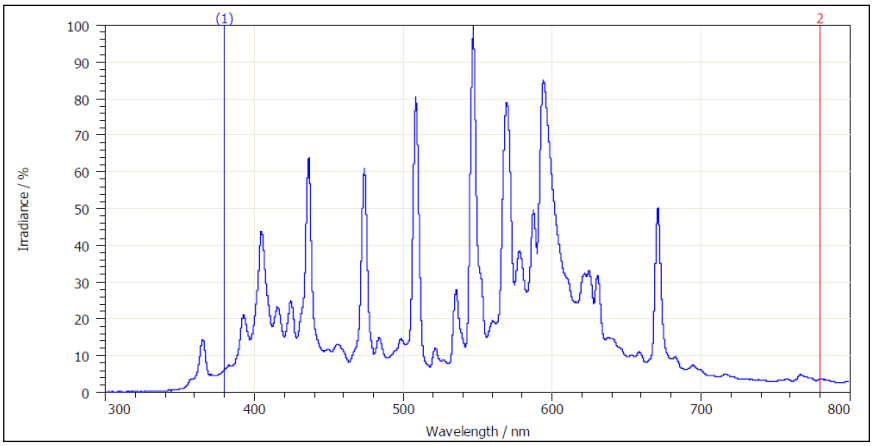
[Spectrum of HPS showing 550~650nm wavelength mainly]

The lux (symbolized lx) is the unit of illuminance in the International System of Units (SI). It is defined in terms of lumens per meter squared (lm/m^2). Reduced to SI base

units, one lux is equal to 0.00146 kilogram per second cubed (1.46 x 10^{-3} kg / s^3).
One lux is the equivalent of 1.46 milliwatt (1.46 x 10^{-3} W) of radiant electromagnetic (EM) power at a frequency of 540 terahertz(THz), impinging at a right angle on a surface whose area is one square meter. A frequency of 540 THz corresponds to a wavelength of about 555 nanometers(nm), which is in the middle of the visible-light spectrum.

Therefore the Lux Meter shows high value for HPS lighting whose light output is concentrated exactly at the measuring wavelength.

Instead, UCD lamp has continuous spectrum for whole visible light spectrum as shown below.



[Continuous spectrum of UCD in 400~700 nano-meter wavelength]

This spectrum proves UCD generates near sunlight lighting which is measures as color rendering index and becomes most comfortable for human eyes.
As the Lux Meter measures at 555nm wavelength, the lux value of UCD may be lower than that of HPS. But the perceptional illuminance of UCD for human eyes is much higher or brighter.