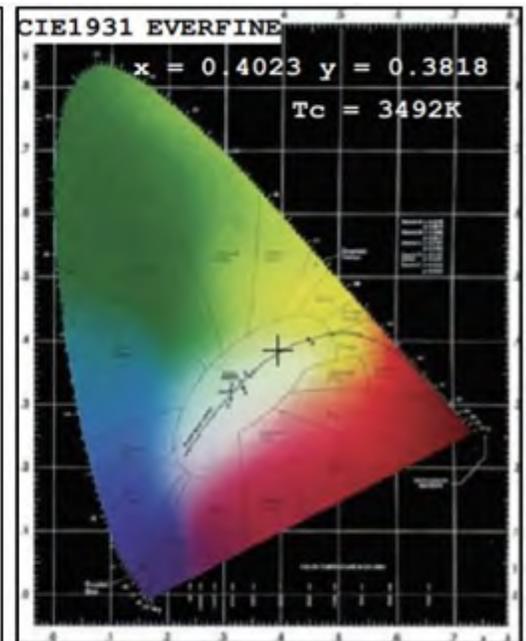
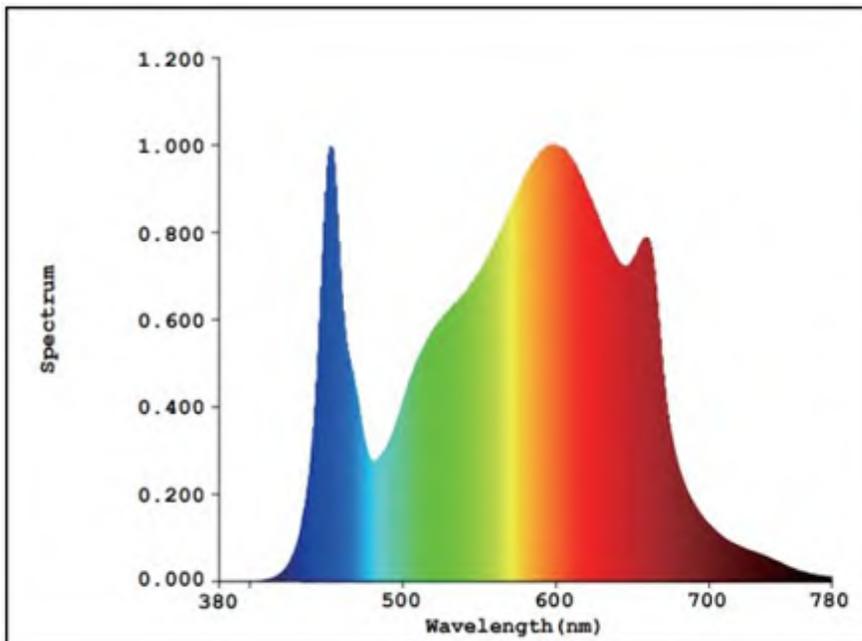
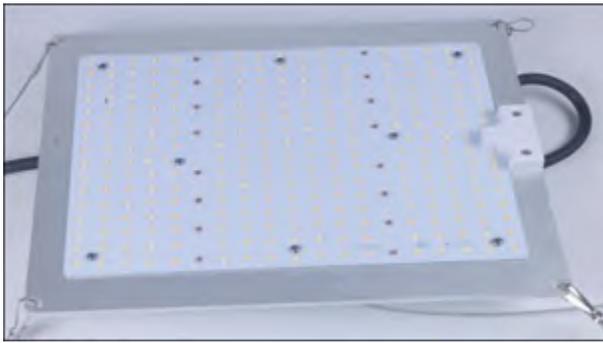


SF LED Grow Lights

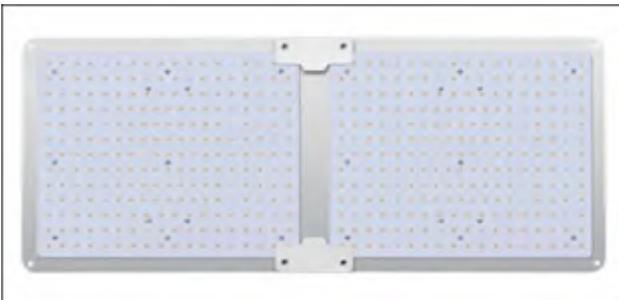




110W Front



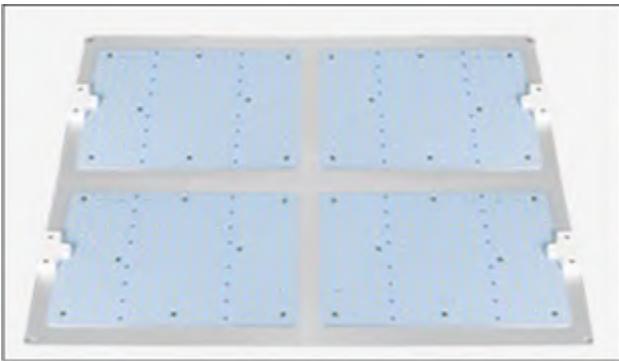
110W Back



220W Front



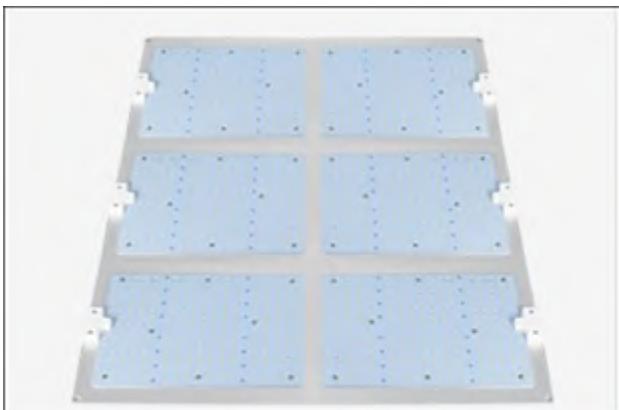
220W Back



440W Front



440W Back



660W Front

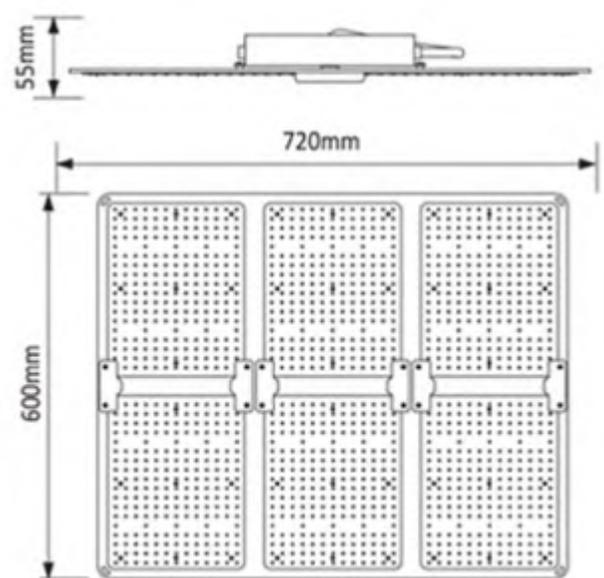
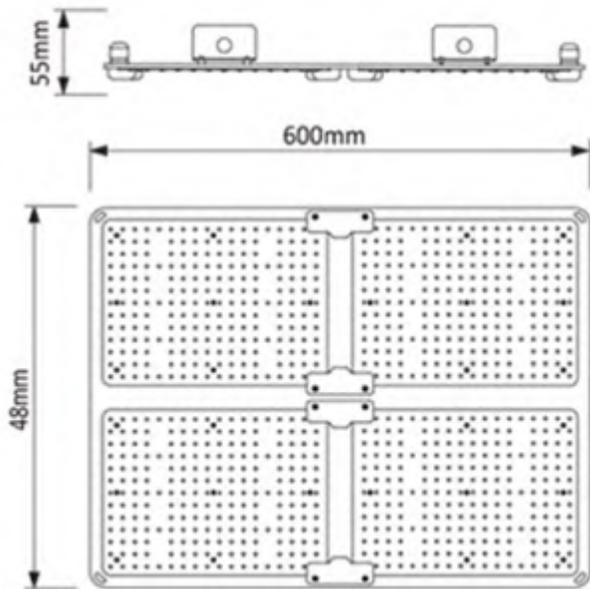
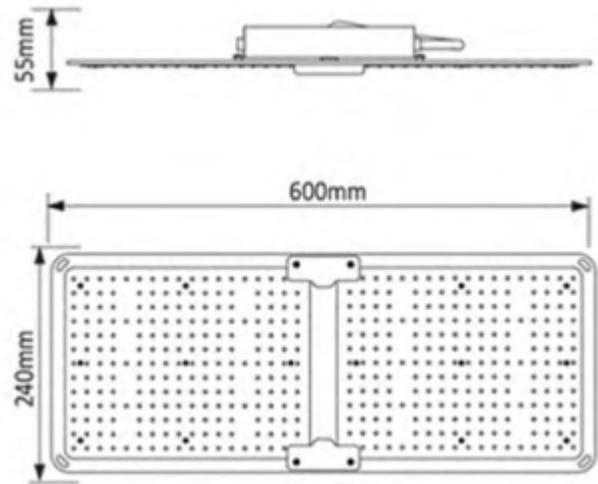
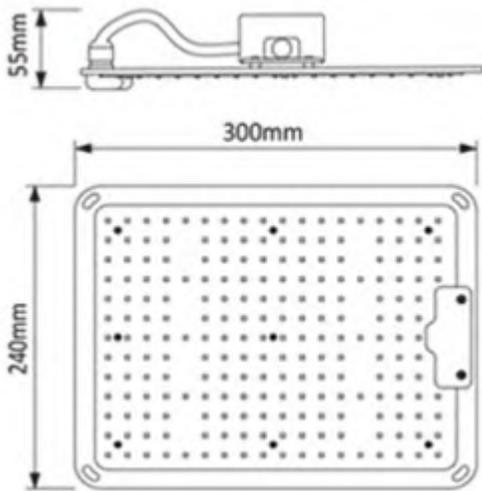


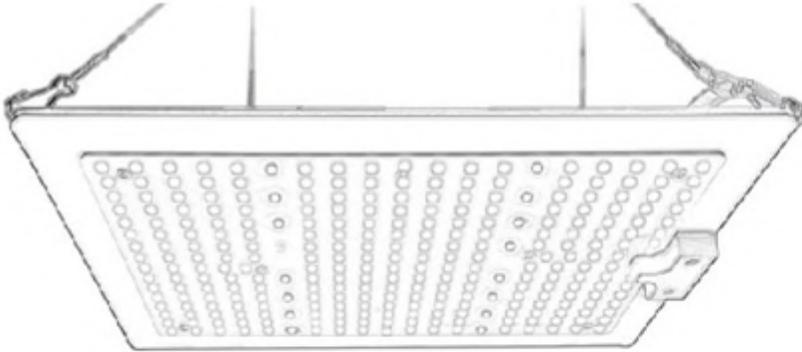
660W Back



Electrical Parameters	Model	ENGL-SF110-04	ENGL-SF220-04	ENGL-SF440-04	ENGL-SF660-04
	Power	110W	220W	440W	660W
	Input Voltage	100~277VAC	100~277VAC	100~277VAC	100~277VAC
	Efficiency	92%	93%	93%	94%
	PF	>0.97	>0.97	>0.97	>0.97
	Dimming Function	0-10V	0-10V	0-10V	0-10V
Plant Parameters	PPE (umol/J)	2.2~2.4	2.2~2.4	2.2~2.4	2.2~2.4
	PPF (umol/s)	230~260	470~500	950~1000	1500~1600
	PPFD (mol/m2/s)	>900(30cm)	>1300(30cm)	>2000(30cm)	>2800(30cm)
	Lumen Efficiency	≥150	≥150	≥150	≥150
	Lumen(lm)	15000	32000	62000	93000
	LED(pcs)	240	496	992	1488
	Beam Angle	120°	120°	120°	120°
Structural Parameters	Color	Silvery	Silvery	Silvery	Silvery
	Material	Aluminum Alloy	Aluminum Alloy	Aluminum Alloy	Aluminum Alloy
	Cable	3*1.0 Silicone Wire	3*1.0 Silicone Wire	3*1.0 Silicone Wire	3*1.5 Silicone Wire
	IP Class	IP65	IP65	IP65	IP65
	Driver	Meanwell	Meanwell	Meanwell	Inventronics
Protection Parameters	Overcurrent	1	1	1	1
	Short Circuit Protection	Yes	Yes	Yes	Yes
	Temperature (25℃)	56℃	56℃	56℃	56℃
Environment Parameters	Working Temperature	-20~40℃	-20~40℃	-20~40℃	-20~40℃
	Lifespan	≥25000h	≥25000h	≥25000h	≥25000h
	Installation	Hanging	Hanging	Hanging	Hanging
Packing Parameters	Net Weight (Kg)	1.75	3.22	6.67	8.28
	Production Dimension(mm)	300*240*55	600*240*55	600*480*55	720*600*55
	Quantity	5pcs	5pcs	5pcs	5pcs
	Inner Box (mm)	350*290*110	650*290*115	650*530*115	780*650*115
	Gross Weight (Kg)	12	16	16.5	23.5
	Carton Dimension (mm)	570*360*305	665*545*250	665*600*250	785*665*250







Materials List:

1. SF LED Grow Light (Driver Included)
2. Plug
3. Hanging Ropes
4. Dimmer



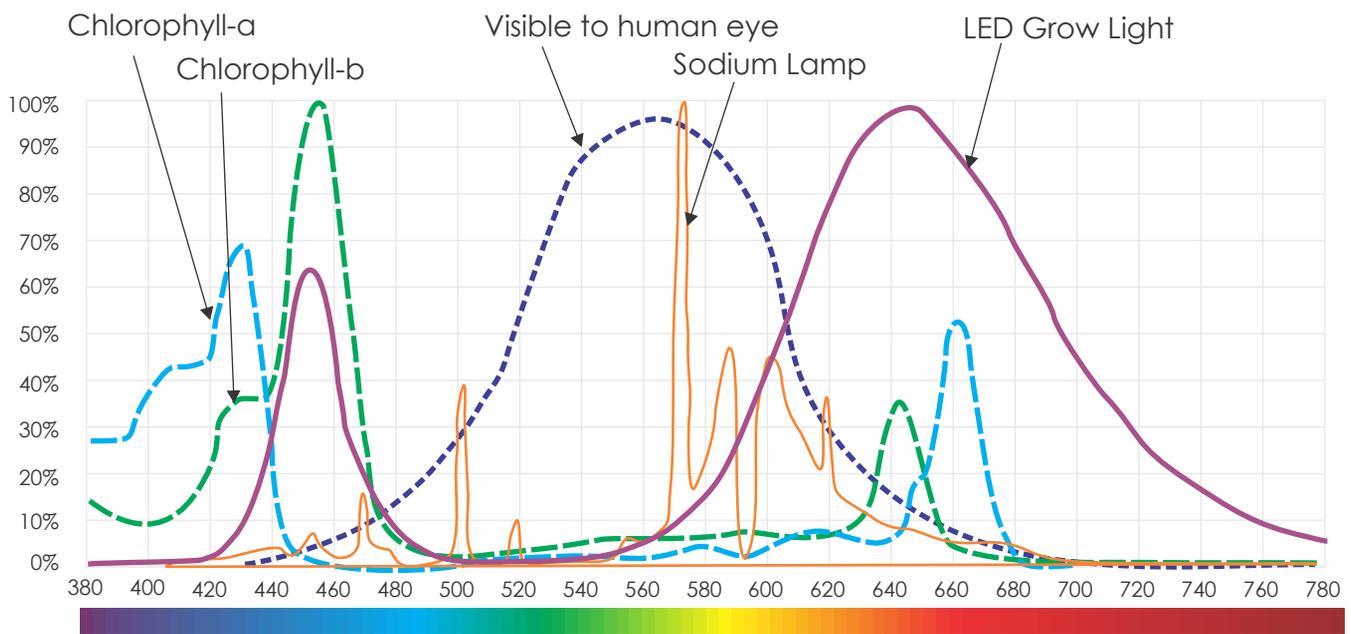
Series Dimming Wiring



What is LED Grow Light?

Plants absorb carbon dioxide and water, release oxygen under photosynthesis and form organic matter, so as to realize the accumulation of organic matter and realize growth. Therefore, photosynthesis is the key to the survival of plants.

LED grow light is a special lamp with a specific spectrum wavelength designed to replace sunlight with light emitted by LED light-emitting elements, specifically to promote photosynthesis of plants, and to create a light environment suitable for growth and development of plants.



Lumen
For illumination



PAR
Photosynthetically Active Radiation
Spectra 400~700nm

- LED Grow Light
- Sodium Lamp
- - - Chlorophyll-a
- - - Chlorophyll-b
- Visible to human eye

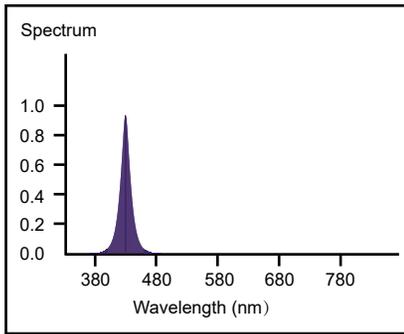


PPF
Photosynthetic Photon Flux
is used by plants for growth and vital activities



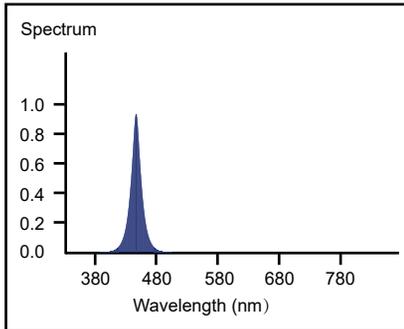
Deep & Far Red
Spectra 660~780nm





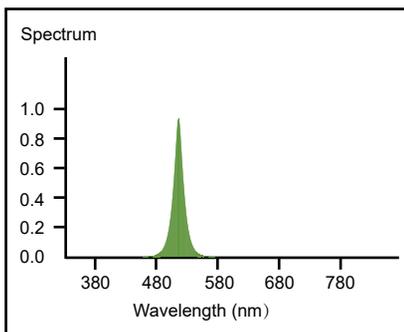
Purple light 390-405nm

1. Purple light is the central area of the phototaxis of plants, which can affect the morphology of plants.
2. Purple light inhibits the growth of the trunk and pages of plants (inhibits leggy).
3. The purple light can stimulate the anthocyanin of plants, promote the color of the fruit/petal or leaves of the plant, and improve the quality.



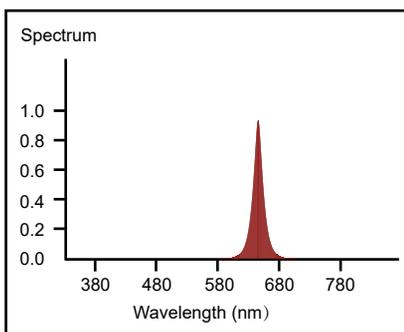
Blue light 450-460nm

1. Blue light has a great effect on the early stage of plant growth, helping plants to establish a developed root system.
2. Blue light inhibits the growth of the trunk and pages of plants, but increases the robustness of the trunk.
3. Chlorophyll a/b has a strong absorption rate in the blue region, which mainly helps plants to synthesize protein and amino acids.
4. Proper blue light makes plants grow more evenly and healthier, and improves the quality of plant output.
5. In a low light environment, the light and effect of blue light on plants is not as strong as red light.



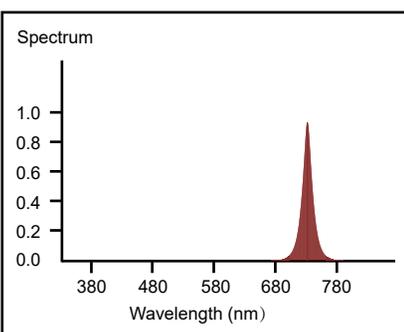
Green light 515-525nm/Yellow-green light 550-570nm

1. Green light has a certain effect of promoting photosynthesis of plants.
2. In a strong light environment (matching other light qualities), green light has the greatest effect.
3. Green light can penetrate the leaf canopy and increase the overall photosynthesis.
4. Green light can synthesize the red and blue spectrum to produce pink purple, reducing visual "light pollution".



Red light 655-665nm

1. Red light is the main force of photosynthesis, and the effect of photosynthesis is the best under certain blue light conditions.
2. Red light mainly helps plants produce carbohydrates, which makes plants grow taller and pages taller.
3. In low light environment, red light has the highest photosynthesis efficiency for plants.



Infrared 730-740nm

1. Through infrared light irradiation, the photosensitizing pigment Pfr is converted to Pr, thereby inhibiting the flowering of plants and controlling the flowering cycle.
2. Combined with 660nm, it can achieve dual-light gain benefit, which is much higher than the photosynthesis efficiency of 660nm alone.
3. Infrared rays can cause plants to produce a shade effect. Under the irradiation of infrared light, plants feel that there are objects that are higher than the light and inhibit the growth of the white body, and they will work hard to grow higher to promote the plant to grow taller.



	Plant	Light Compensation Point	Light Saturation Point	
	Succulent Crassulaceae	PPFD-30	PPFD-250 PPF-NIR-110	
	Succulent Apricotaceae	PPFD-35	PPFD-260 PPF-NIR-115	
	Succulent Liliaceae	PPFD-25	PPFD-230 PPF-NIR-98	
	Herbivores	PPFD-35	PPFD-240 PPF-NIR-112	
	Green leafy vegetables	PPFD-55	PPFD-350 PPF-NIR-165	
	Indoor green plants	PPFD-15	PPFD-120 PPF-NIR-40	
	Guolan	PPFD-45	PPFD-200 PPF-NIR-90	
	Phalaenopsis	PPFD-35	PPFD-180 PPF-NIR-65	
	Dendrobium	PPFD-28	PPFD-155 PPF-NIR-45	
	Korean Ginseng	PPFD-38	PPFD-220 PPF-NIR-78	
	Foliage plant	PPFD-55	PPFD-230 PPF-NIR-84	
	Tomato	PPFD-55	PPFD-244 PPF-NIR-92	
	Lotus	PPFD-55	PPFD-320 PPF-NIR-160	
	Strawberry	PPFD-45	PPFD-320 PPF-NIR-140	



Photosynthetic photon flux (PPF)

Photosynthetic photon flux (photosynthetic photon flux), abbreviated as PPF, can be the photon flux used by plant photosynthesis. The unit is: micromole per second ($\mu\text{mol} \cdot \text{s}^{-1}$).

Note: In the field of plant physiology, the number of photons is usually expressed in micromoles (μmol), 1 μmol represents 6.023×10^{17} photons, and 1 mol represents 6.023×10^{23} photons.

The photochemical reaction of photosynthesis is closely related to the number of absorbed light quanta. For example, the energy of the light quanta in the blue light region is about twice that of the red light region, but the light quanta in these two regions have the same effect in photosynthesis.

Therefore, in photosynthesis, the amount of light is expressed by the number of photons in a certain wavelength range (400-700nm), which is the so-called photosynthetic light quantum flux. Note: It is equivalent to the concept of conventional lighting flux.

Photosynthetic photon flux efficiency (PPE)

The photosynthetic photon flux efficiency abbreviated as EFF (PPF) or PPE means the effective micromole radiated by the artificial radiation source in the range of 400-700NM per watt per second, and its unit is: $\mu\text{mol}/\text{s}/\text{w}$ or $\mu\text{mol}/\text{J}$.

Photosynthetic photon flux efficiency = photosynthetic light quantum flux/power.

Note: The concept of light efficiency is quite dry for conventional lighting products. At present, professional high-power plant lamps pay attention to the spectrum and efficiency of the lamps. According to the American DLC standard, the photosynthetic light quantum flux efficiency EFF (PPF): $>1.9 \mu\text{mol}/\text{J}$ (-5%).

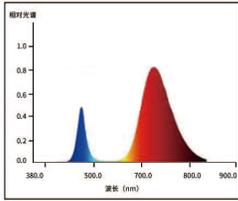
Photosynthetic photon flux density (PPFD)

Photosynthetic photon flux density (Photosynthetic Photon Flux Density), abbreviated as PPFD, is the number of micromoles radiated by the light source per square meter per second, in $\mu\text{mol}/\text{m}^2$, which is the concept of density.

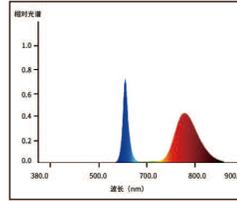
PPFD is the PPF $1 \mu\text{mol}/\text{m}^2$ in the range of one square meter, which means that the number of photons per second in the 400-700NM wavelength range is radiated on the surface of 1 square meter. It is equivalent to the concept of illuminance of conventional lighting products.

Note: It is equivalent to the concept of illuminance of conventional lighting products.

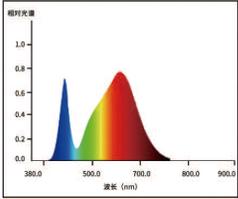




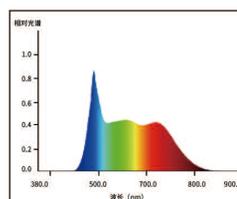
Full spectrum name	Spectrum No. 1
Color	Pink purple light
Main Function	Red light makes plants grow, blue light promotes the accumulation of protein and non-carbohydrates, and makes plants gain weight
Applicable Plants	Suitable for the nursery period of strawberry, dragon fruit melon, leafy vegetable in greenhouse, marijuana, succulent



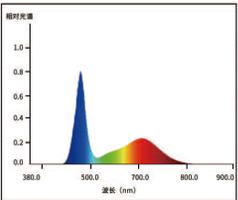
Full spectrum name	Spectrum No. 2
Color	Pink purple light
Main Function	Blue light affects the phototropism of plants, and the part of the red light produced by photomorphogenesis makes plants grow taller.
Applicable Plants	It is suitable for the nursery period of strawberry, dragon fruit, melon, leaf and vegetable in greenhouse. Hemp, succulent.



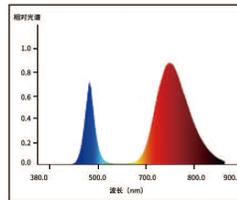
Full spectrum name	Spectrum No. 3
Color	Warm white light
Main Function	Blue-green light makes the ratio of chlorophyll large and photosynthesis obvious, and red light makes the photosynthesis cycle effect have an influence.
Applicable Plants	Suitable for the nursery period of strawberry, dragon fruit, melon, leaf and vegetable in greenhouse, marijuana, succulent.



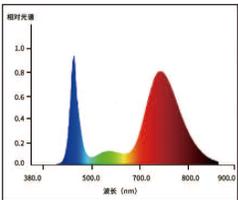
Full spectrum name	Spectrum No. 4
Color	Positive white light
Main Function	The spectrum is saturated, which promotes the rich photosynthesis of plants and forms chlorophyll absorption.
Applicable Plants	It is suitable for roots, rhizome crops, ornamental horticultural plant walls, growing strong seedlings, and succulents to fill light.



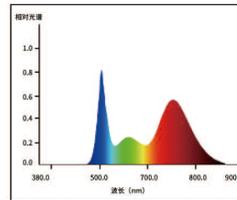
Full spectrum name	Spectrum No. 7
Color	Light pink
Main Function	Improve the flowering period, increase the yield of melons and fruits, and adjust the morphology of plants, which is conducive to the synthesis of VC and sugar in fruits and vegetables.
Applicable Plants	Suitable for flowers, plant factories, fruits, tomatoes (tomatoes), growth period.



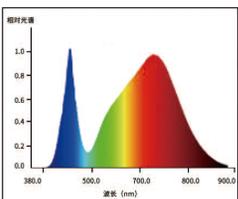
Full spectrum name	Spectrum No. 9
Color	Pink purple light
Main Function	Combined with effective radiation, it promotes the accumulation of protein and non-carbohydrates and increases plant weight.
Applicable Plants	Suitable for the seedling period of sprouts, leafy vegetables, melons and fruits.



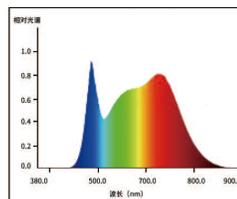
Full spectrum name	Spectrum No. 10
Color	Warm pink light
Main Function	Green light and red and blue light harmoniously regulate and adapt to the growth and development of plants.
Applicable Plants	Suitable for sprouts, rhizomes, rattans.



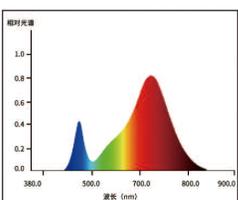
Full spectrum name	Spectrum No. 11
Color	Positive white light
Main Function	Red light and blue-violet light are the most effective for the light response of photosynthesis.
Applicable Plants	Red light and blue-violet light are the most effective for the light response of photosynthesis.



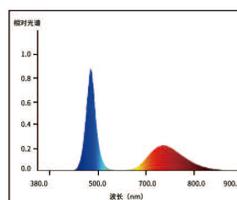
Full spectrum name	Spectrum No. 12
Color	Warm white light
Main Function	Blue-green light makes the ratio of chlorophyll large and photosynthesis obvious, and red light makes the photosynthesis cycle effect have an influence.
Applicable Plants	Suitable for outdoor dragon fruit, flowers, aquatic plants, melons and fruits to fill light, growth period.



Full spectrum name	Spectrum No. 13
Color	Natural light
Main Function	The spectrum is saturated, which promotes the rich photosynthesis of plants and forms chlorophyll absorption.
Applicable Plants	Suitable for outdoor dragon fruit, flowers and plants, melons and fruits to fill light, growth period.



Full spectrum name	Spectrum No. 15
Color	Warm white light
Main Function	Red light drives photosynthesis to protect the elongation and carbohydrate synthesis, which is beneficial to flower growth and prolongs the flowering period.
Applicable Plants	Suitable for flowering and fruiting, sprouts, lilies, Apricotaceae, Cruciferae, melons and fruits.



Full spectrum name	Spectrum No. 16
Color	Violet light
Main Function	Affect the phototropism, photomorphogenesis, and leaf photosynthesis of plants, and promote the growth and development of seedlings.
Applicable Plants	Suitable for leafy vegetables, stems, apricots, lilies, twelve rolls, melons and fruits, seedlings.

