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Horticulture Lighting Solutions – 2023

OSRAM
LED TECHNOLOGY INCLUDED

SAYAN
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Horticulture lighting
Product brochure

Manufacturer of general and specialized lighting systems

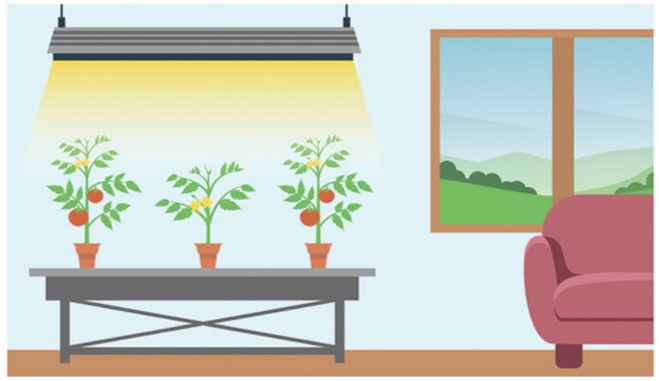
Light
Nature of growth

Artificial lights in future agriculture

By 2050, the world's population will reach 9.5 billion, with two-thirds of the population living in large cities. The food needs of the world's population will be 70% higher than current production capacity. As we know, traditional agriculture will no longer be sufficient to provide a healthy food to people living in large cities. One possible solution is industrial agriculture, which includes growing plants in greenhouses, vertical farms and urban farming, without need for sunlight. Artificial lighting is key subject in utilizing this method. In this regard, LEDs perform better in several features compared to other light sources. Also LEDs provide ideal wavelengths to enhance photosynthesis in plants.

Benefits of LED horticulture lighting

Increasing photosynthesis and accelerating plant growth.
Increasing flowering and fruiting in plants.
Reducing energy consumption with optimal efficiency.
Reducing transportation costs for agricultural products.
Growing ability in all seasons and geographical conditions.



Applications of LED grow lights

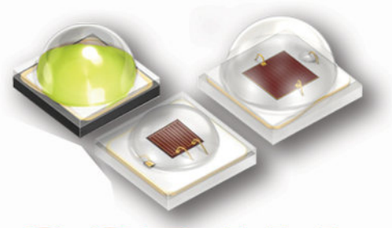
Industrial greenhouses
Home applications and apartments
Greenwalls
Tissue culture laboratories
Vertical farming
Urban farming

Growth light key factors

DLI: Total amount of light required for the plants growth during a day.
PPF: Total produced photosynthetic photon flux measured in umol/s.
PPFD: Photosynthetic photon flux density on plant's canopy measured in $\frac{umol}{s.m2}$.
Light Efficiency: Energy conversion rate to photon measured in umol/j.
Spectral Power Distribution: Distribution curve of lights wavelengths.
Lifespan: Effective operating time of grow light in hours.
IP Rating: Resistance of grow light against solid particles and liquids.

High quality SMD LED chips

We are at the forefront of smart lighting in the agricultural industry. We specialize in designing and manufacturing LED lights for plant growth in greenhouses and vertical farms, using the high quality LED chips under the latest global technology. This leads to increased productivity in agricultural products, improved nutritional factors, and reduced fossil fuel energy consumption. We use LED chips provided by OSRAM company for designing and manufacturing various LED modules and LED grow lights. By providing specialized solutions and designs for plant growth, we aim to increase crops productivity and address the challenges in agriculture industry and food security.



Designing customized LED modules

As one of the leaders in the LED module industry in iran, we have the ability to design and manufacture LED modules in various sizes and dimensions. Relying on our outstanding technical expertise and knowledge, our goal is to meet the needs of plant growth light manufacturers as well as consumers, including growers, and greenhouse owners. Whether you are looking for a small and beautiful light for home applications, or a powerful light for industrial projects, we are capable of designing and manufacturing custom LED modules to bring your ideas to life. In manufacturing LED modules, we use one of the best and highest quality SMD LED chips.

The LEDs provided by OSRAM's company assures you that you will have high efficiency, durable, stable, and long-lasting LED lights. With cutting-edge technologies and optimal designs, LED modules with high efficiency and low energy consumption allow you to experience increasing crops productivity and energy saving. Our team, help you choose the right LED modules to meet your needs. Stay with us and order your LED modules according to your site, needs and budget. Contact us and provide sufficient, high quality light for your plants.

Calculating and simulating horticulture lighting solutions

There are different factors and features involved in lighting various kinds of plants. We found each type of plants needs different light which can be a challenging issue. Our team cooperate directly with scientists, researchers and plant growers to elevate the quality and quantity of crops to new levels.

First step in designing artificial lighting for industrial projects and greenhouses is to collect environmental information from the site and perform calculations and simulations, which is done by our R&D team. According to the needs of growers and greenhouse owners and taking into account environmental conditions and information collected from each project, customized designs are made by Sayan Electric's specialized teams.

Additionally, by close cooperation with researchers and scientists in agriculture field and participating in specialized researches, we are able to design, simulate and implement specialized projects, including crops speed breeding and tissue culture in research centers. Sayan Electric's goal is taking part in shaping the future of plants lighting systems and increasing productivity in agriculture industry.

ARPAT

Pendent

Power [w] :	107
PPF [umol/s] :	315
Luminous Efficancy [umol/J] :	2.91
Dimensions [cm] :	60 * 10
Dominant Wavelength [nm] :	450+550+660+730
Applications :	Industrial Greenhouse Research centers Growing medicinal plants

EKIN

Pendent

Power [w] :	110
PPF [umol/s] :	238
Luminous Efficancy [umol/J] :	2.20
Dimensions [cm] :	25
Dominant Wavelength [nm] :	450+550+660
Applications :	Industrial greenhouse Greenhouse flowers Growing medicinal plants

FL. ARPAT

Pendent

Power [w] :	500
PPF [umol/s] :	1700
Luminous Efficancy [umol/J] :	3.40
Dimensions [cm] :	50*20
Dominant Wavelength [nm] :	450+550+660
Applications :	Industrial greenhouse Greenhouse flowers Growing medicinal plants

Plants are living and amazing nature that grow and develop with sunlight. However, sometimes weather conditions or where we live may not meet the light needs of plants. Here is introduction of plants growth LED lights as a great solution to help grow better and healthier. Currently, the use of plants grow lights in home and industrial applications is increasing. Here we discuss the importance of these factors and their impact on the growth and development of plants so that consumers of these lights can avoid undesirable events with more knowledge and be guided to the best way to use plant growth LED lights.

Lighting Duration, proper lighting time duration is very important for plants. Plants need the specific period of light and darkness during 24 hours a day, to carry out the photosynthesis process well and provide necessary energy for their growth and development. On the other hand, the light needs of plants changes in different stages of growth. Therefore, it is very important to pay attention to the amount of lighting time according to the needs of plants, so that the plant grow lights can be used in the best way.

Right Distance, the proper distance between grow light and the plant is also very important to maintain healthy and optimal growth of plants. If there is insufficient distance between the grow light and the plant, the plant may get burned due to excessive light intensity or grow inappropriately. Also, too much distance can reduce the effect of light on plants and lead to poor plant growth. Therefore, paying attention to the proper distance and setting it correctly is of great importance to reach high effectiveness in plants LED grow lights.

Plant Type	Application	Growth Stage	Lighting Duration (Hours Per Day)	Proper Distance (cm)	Recommended Product
Vegetables	Home Applications Vertical Farming	Vegetative	14-16	15-30	Tube ARPAT PARLUX Linear ARPAT
Medicinal Plants	Greenhouse s Home Application Vertical Farming Tissue Culture	Vegetative Reproductive	18-23 Depend On Plant 14-16 Depend On Plant	30-60 20-40	Tube ARPAT PARLUX ARPAT Linear ARPAT
Indoor Flowering	Home Application Apartments Indooors	Reproductive Flowering	14-16 14-18	30-45 20-35	Nirvana H8 PARLA Tube ARPAT AVALON
Strawberry	Greenhouse	Vegetative Fruiting & Flowering	14-16 16-18	45 < 45 <	FL. ARPAT EKIN
Wheat	Greenhouses Vertical Farming	Vegetative Reproductive	20-22 20-22	60 < 60 <	ARPAT EKIN
Tomato	Greenhouse	Vegetative Fruiting & Flowering	Depend On Site Depend On Site	60 < 60 <	FL. ARPAT ARPAT
Greenwall	Entertainment & Shop Centers Lobbies	Vegetative	Depend On Plant	30-80	Linear ARPAT PARLA
Flower Greenhouses	Greenhouses	Vegetative & Flowering	6-18	45 <	EKIN FL. ARPAT

AVALON

Recessed

Power [w] :	50 | 8
PPF [umol/s] :	124 | 21.6
Luminous Efficancy [umol/J] :	2.50 | 2.70
Dimensions [cm] :	8 | 6
Dominant Wavelength [nm] :	450+660
Applications :	Home applications
	Indoor flowers

NIRVANA H8

Surface Mounted / Pendent

Power [w] :	10
PPF [umol/s] :	21
Luminous Efficancy [umol/J] :	2.10
Dimensions [cm] :	8
Dominant Wavelength [nm] :	450+660
Applications :	Home applications
	Stores & commerical centers

PARLA

Surface Mounted

Power [w] :	10
PPF [umol/s] :	22
Luminous Efficancy [umol/J] :	2.20
Dimensions [cm] :	8
Dominant Wavelength [nm] :	450+660
Applications :	Greenwalls
	Stores
	Indoor flowers

Tube ARPAT

Surface Mounted

Power [w] :	60
PPF [umol/s] :	130
Luminous Efficancy [umol/J] :	2.20
Dimensions [cm] :	120
Dominant Wavelength [nm] :	450 | 660
Applications :	Tissue culture
	Vertical farming
	Vegetables
	Medicinal plants

Linear ARPAT

Surface Mounted/ Pendent

Power [w] :	60
PPF [umol/s] :	130
Luminous Efficancy [umol/J] :	2.20
Dimensions [cm] :	100
Dominant Wavelength [nm] :	450+660
Applications :	Greenwalls
	Indoor flowers
	Vertical farming
	Tissue culture

PARLUX

Surface Mounted/ Pendent

Power [w] :	35
PPF [umol/s] :	76
Luminous Efficancy [umol/J] :	2.20
Dimensions [cm] :	100
Dominant Wavelength [nm] :	450+660
Applications :	Greenwalls
	Indoor flowers
	Vertical farming
	Tissue culture