

LEDs promote plant growth

FIONIA LIGHTING



Osram Opto Semiconductors (Munich, Germany) now offers two deep-red-emitting LED products that provide energy-efficient, narrow-wavelength illumination for greenhouse-cultivated vegetation. The Golden Dragon Plus and Oslon SSL both provide 660 nm illumination with an efficiency of 37%, which the company says is among the most efficient on the market. Deep-red light is a good match to the spectral sensitivity of chlorophyll, thus promoting plant growth when used in combination with blue light. The Golden Dragon Plus has a wide beam angle of 170° and can be used with reflector systems to illuminate large cultivation areas. The Oslon has a smaller footprint and a beam angle of 80°, which allows the LEDs to be closely spaced. The Oslon's LEDs can also be equipped with external optics, which allows plants to be cultivated in stacked layers. LEDs from both units are based on the company's thin-film technology, providing typical lifetimes of 100,000 h at powers of around 330 mW and operating currents of 400 mA. In a pilot project in Denmark, use of these products over a cultivation area measuring several thousand square metres cut energy usage by 40%. Osram says the plants grew just as quickly as when under conventional lighting, but required less chemical growth regulators.

www.osram-os.com

Coatings enhance solar cells

Honeywell Electronic Materials (Spokane, Washington, USA) has developed a new

antireflective coating for solar panels. Solarc RPV is a sol-gel-based transparent coating that increases the efficiency and power output of a photovoltaic module by improving the transmittance of light through its glass layer. The coating also reduces glare, which is important for improving the aesthetics of photovoltaic panels in residential installations. By reducing reflections, the coating improves transmittance by 4% at 550 nm and 3–3.5% at 350–1,100 nm — the solar range relevant to photovoltaics. The high-durability material can be applied using a single-sided roller coating — a simple process that uses a minimal amount of material. The coating has a shelf life of greater than six months at room temperature.

www.honeywell.com

Organic LEDs provide mood lighting

Verbatim (Charlotte, North Carolina, USA) and Mitsubishi Kagaku Media Company (Tokyo, Japan) have produced what they say is the world's first mass-produced, dimmable and colour-tunable organic LED panel. The modules measure 14 cm × 14 cm, making them among the world's largest. The panels are thin and flexible, contain no mercury and use less power than traditional LEDs. The technology allows the intensity and saturation of the light to be adjusted at will, providing lighting designers with great flexibility. For example, the panels could be set to produce different colours and levels of brightness depending on the time of day or the season. In addition to being tunable at red, green and blue wavelengths, the device's white light can be tuned from 'warm' (2,700 K) to 'cool' (6,500 K). Colour and flux are maintained during dimming.

www.verbatim.com

Light concentrators for flat solution

HyperSolar (Santa Barbara, California, USA) is developing a light concentrator that will hopefully quadruple the output power of a solar panel. The current prototype is designed to provide a light enhancement of 300%, but the company is aiming to achieve at least 400% in its eventual commercial product. Such light magnification would reduce the number of solar cells in a photovoltaic panel by three quarters, cutting the amount of silicon required and reducing the cost-per-watt of the electricity produced. The concentrator will be approximately 1 cm thick and will be applied to flat solar panels as a top

sheet. Whereas today's concentrators for photovoltaic panels require bulky mirrors, lenses and sun-tracking mechanisms, this new device from HyperSolar will be thin, flat and self-tracking.

www.hypersolar.com

Optical sensor tackles oxygen



AQUAREAD

The AquaPlus Meter from AquaRead (Kent, England) is a portable optical sensor for measuring the dissolved oxygen content in a sample water. The device monitors dynamic luminescence quenching, in which a blue light source causes a lumophore to emit red photons. Because the emission of red photons in this process is affected by the presence of oxygen, comparing the returned red photons with the emitted blue photons provides a measurement of the dissolved oxygen in the system. The sensor allows the monitoring of surface, ground and waste water, for applications such as fish farming and brewing. The fully waterproof sensor module is housed in a resin-filled marine-grade aluminium body measuring 8 mm × 13 mm. It contains blue excitation and red reference LEDs, optical filters, a photon detector, a temperature sensor, driver circuitry and high-gain amplification circuitry. The module fits into the end of a standard 12 mm dissolved oxygen electrode, in place of a traditional Clark cell. The system includes a barometric sensor and an electrical conductivity sensor for measuring salinity. One version of the AquaPlus Meter is also equipped with a global positioning system, allowing data taken during fieldwork to be tagged with time, date and location information. Up to 3,000 readings can be tagged and later downloaded to a PC using the included USB cable and software. The system runs on 5 AA alkaline batteries.

www.aquaread.co.uk