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TECHNOLOGY AND APPLICATIONS OF LIGHT EMITTING DIODES

European SSL spans art to institutions

Out-of-the-box design
shines across the
spectrum P. 35



most notable installations are 15m poles that each have 15 Selux Olivio Grande heads installed in a spiral fashion around the poles. The poles were located at the main entrance and prominent locations near the EXPO tower and square. The design was intended to create a natural and inviting environment, and in fact the luminaires in the Olivio Sistema design line have what Selux calls a floral organic shape, which was symbiotic with the horticultural theme of the fair. In other areas such as walkways and around the VIP building and press center, Selux Astro area luminaires provided a round symmetrical light distribution. Those low-profile luminaires also have a blue effect ring surrounding the light engine that adds a touch of style to the scene and what Selux called “a pleasantly sobering contrast” to the higher-profile poles.

Italy Brenner Highway tunnels

Europe features many more highway tunnels than do other regions of the globe, and safely lighting such tunnels is imperative with drivers moving through open space with sun exposure and tunnels repeatedly on many routes. Cree recently supplied new lighting on the A22 Brenner Highway — an important route that connects the Italian Po Valley with the A1 Highway and ultimately with Austria and Germany. The Castelrotto and Sant’Osvaldo tunnels, located near the town of Castelrotto, Italy had been lit conventionally back in 1964, but that lighting did not produce the light levels recommended by current regulatory agencies. The Autostrada del Brennero S.p.A. highway management company located in Trento had been working on a plan for relighting the tunnels dating back to 2007, and had originally planned to install a hybrid LED and high-pressure sodium (HPS) system to balance cost and maintenance. But the continuous improvement of LED-based lighting and cost reductions allowed the project to proceed using all LED lighting. Ultimately 686 Cree



LEDway E-Tunnel luminaires were installed, reducing annual energy use from 746,000 kWh to 435,000 kWh. Perhaps more important, the lighting is much improved for drivers. HPS lamps have notoriously poor color rendering and Cree said the transition by drivers from full sun to the tunnel lighting is much smoother due to the relatively higher CRI of the LED luminaires. Moreover, the new lighting

can be operated at 75% of full power and still meet the regulatory requirements. The system is expected to operate for 140,000 hours.

Latvia National Museum of Fine Arts

Europe is renowned for its many museums and increasingly such institutions are turning to LEDs to light their treasured works of art. For example, we covered a major LED retrofit of the Rijksmuseum in



Amsterdam a few years back (<http://bit.ly/Ls8HzB>). Initially, the motivation of curators considering a move to SSL was energy efficiency and low maintenance requirements. But increasingly with improvements in LED technology, a move to SSL can improve the visitor experience. The National Museum of Fine Arts in Riga, Latvia on the Baltic Sea has recently completed a retrofit providing visitors what it calls a “multi-sensory experience.” The lighting supplied by Linea Light Group was intended to blend the artwork into the surrounding architecture and “guide the viewer emotionally.” The project included lighting the baroque-style façade crafted by German architect Wilhelm Neumann along with the indoor space where the art is housed. The majority of the project focused on the art is based on the Sunrise and Vektor projector-style luminaires from Linea. And most of the 1300 luminaires are equipped with DALI (digital addressable lighting interface) network connectivity for remote control. The luminaires are generally installed on ceiling tracks, yet precise beam control ensures that the light is focused on the target artwork.

Algiers Centre International Conferences

While Algiers lies on the south side of the Mediterranean Sea as opposed to the European continent, the city has a distinctly European feel to it and indeed was under French rule for many years. The city recently constructed the largest convention center in North Africa — the Centre International Conferences (CIC) — and the congress center presented a variety of lighting challenges. The design was intended to echo local architecture while also featuring what the city called a hypermodern design. The facility has 8045 m² of glass and 12,160 m² of marble. The Theveste Auditorium perhaps best symbolizes the challenge with space for 6000 people in 6300 m² of space. B Light supplied its Inserto Mini Slim CL linear



luminaires for the ceiling that creates what the company called light blades. Moreover, color-capable versions of the luminaires provide dynamic highlighting of circular engravings on the ceiling. The designers selected 3000K-CCT LED sources for the project with a very high CRI of 93. A DMX control system underlies the design. Other areas of the CIC have vastly different lighting needs. For example, in the smaller Djmelia conference room that holds 700, Atlas luminaires were inlaid into wooden panels blending into the architecture. Connecting spaces and corridors were lit with Inserto Medium 105 Edge luminaires installed in places such as columns.

OhBo restaurant in Barcelona

Hospitality lighting has been one of the tougher challenges for lighting designers working with LEDs because the legacy halogen lamps often used in spaces such as restaurants provide good CRI and comforting warm-white light. But evolving technology in LED components and lamp and fixture design is allowing SSL to succeed in such a demanding environment. For example, Sora lamps were installed in a stylish London restaurant (<http://bit.ly/1kxAH6T>) recently and we covered a hotel/restaurant renovation in Copenhagen earlier this year (<http://bit.ly/2f4AMl0>). In the Sant Gervasi neighborhood of Barcelona, Lamp Lighting has supplied LED technology in a design intended to match the farm-to-table emphasis of the OhBo



restaurant. Isabel López Vilalta + Asociados handled the design with the internal architecture featuring a rustic environment utilizing recovered materials. For the lighting, the firm installed Lamp Lighting's Imag projectors that have a unique housing serving as a stylish shell and heat sink. The products use chip-on-board LED technology to deliver uniform beams on the customer tables.

Fermo Valtenna box factory

Commercial spaces were among the first application sectors to adopt LED-based lighting, led initially by the high electrical cost of lighting. Energy efficiency remains a key driver of SSL adoption in the sector, although the latest designs also reveal the flexibility of LEDs in terms of luminaire form factor and the quality of LED sources. For example, see our article on a German project at the Leica Camera facility (<http://bit.ly/2eFIVtB>). More recently, Linea Light Group has supplied a project by lighting designer Stefano Dall'Osso at the new Valtenna box factory in Fermo, Italy. The company has made sustainability the focus of its planning and manufacturing systems, and sought to carry that theme through the building including the use of natural materi-



als such as wood and glass. Dall'Osso was charged with matching that theme with lighting and including the use of natural light or daylighting where possible. Dall'Osso ultimately developed custom fixtures for the project that included fluorescent sources for direct light and LED-based indirect lighting that was mounted on the walls and diffused into the high ceilings, also highlighting the dramatic exposed wooden surfaces. The building includes automatic dimming based on available natural light with the system programmed to maintain the 500-lx level required by local regulations.

Le Silla footwear office in Porto Sant'Elpidio

Glamour footwear company Le Silla based in Porto Sant'Elpidio, Italy needed a lighting design that might be more akin to high-end retail lighting than to an office and factory building. The employees need to evaluate colors properly in crafting new products, which now include bags and beach fashions in addition to shoes, and the fashion-focused business needed a showplace commensurate with