

Case Study



Case Study: Wall Pack Fixtures

Guth Lighting Creates 18-Year, Low-Watt Winner with LUXEON Rebel.

One of the beauties of today's power LEDs is their ability to teach older fixtures new tricks. Guth Lighting's SUNDOWNER series of wall pack luminaires is a case in point. In early 2008, the company decided to add LED models to its existing metal halide, fluorescent and high-pressure sodium SKUs. The goal was to deliver a longer-lasting, energy-efficient way to light up the night in both indoor and outdoor settings.

When the SUNDOWNER LED family was introduced at Lightfair International in May 2008, that mission was accomplished and more. Built with LUXEON Rebel LEDs from Philips Lumileds (www.philipslumileds.com), the luminaires offer a record-breaking 18-year lifetime and 80% energy savings, along with a new LED-enabled design that offers a wider illumination field than any previous fixture in the class. The result: better visibility as well as a reduction in the number of fixtures needed to cover a given area.

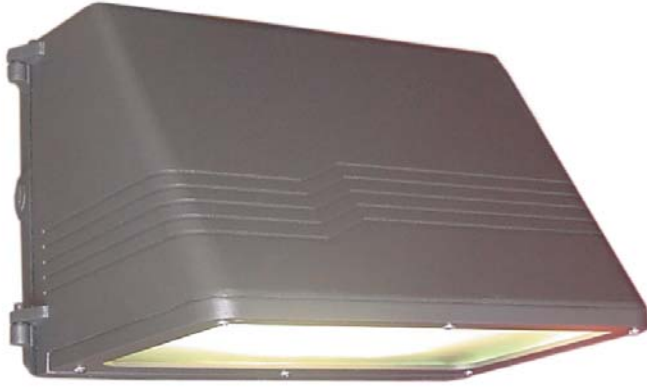
"This is our first LED-based product, and it is truly a case of building a better mousetrap," said Bob Catone, General Manager of Guth Lighting (www.guth.com). "LUXEON technology gave us the tools to completely transform this product category."

Rebel to the Rescue

Guth's SUNDOWNER wall packs illuminate environments ranging from building facades to theaters, parking structures, tunnels, doorways and indoor walkways. All SKUs utilize a cut-off 'dark sky' housing to eliminate uplight that might spill over onto neighboring buildings or into the night sky.

For the new LED-based series, Guth decided to develop four 14" models—consisting of luminaires with 4 LEDs for doorways, 12 LEDs for replacement scenarios, 16 LEDs

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Guth SUNDOWNER LED.

for forward throw applications requiring a portion of the light to be directed into parking lot areas adjacent to a building wall, and 20 LEDs for new construction not tied to existing fixture placement— plus an 18” version with 40 LEDs for applications requiring mounting heights in the 20-foot range.

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Also contributing to the choice of LUXEON Rebel was the color consistency available through Philips Lumileds’ tight binning structure and patented conformal coating process. These factors ensured that all of the white LEDs used in SUNDOWNER LED products would have correlated color temperatures of 4000K to 4500K as specified by the design team, providing a uniform appearance within and among luminaires.

Longer & Greener

With LUXEON Rebel LEDs under the hood, Guth’s new wall packs last up to seven times longer than 10,000-hour metal halide and fluorescent models and 20,000-hour high-pressure sodium versions. That translates into 18 years of running the new SUNDOWNER LED products 10 to 12 hours a day based on a junction temperature of 120°C. Since the LEDs in the fixtures run at 90°C, the fixtures could last even longer.

“You shouldn’t have to service the solid-state light source for the life of the fixture,” Catone noted. “This will significantly reduce maintenance as well as eliminating replacement bulb costs.”

The LUXEON-based SUNDOWNERS also use a fraction of the energy of their conventionally lit counterparts. The 12-LED retrofit model, for example, consumes just 21W of power compared to 200W for the average comparable product. The numbers are 35W versus 250W for the 20-LED model, and 62W versus 450W for the 40-LED SKU. This supports ‘green’ initiatives to reduce energy consumption, significantly lowers the total cost of fixture ownership, and gives building owners an opportunity to earn LEED energy credits from SUNDOWNER LED installations.

Fewer Fixtures Needed

Additional environmental and economic benefits stem from a proprietary optic that allows the solid-state SUNDOWNER products to light up a broader surface area than wall pack luminaires built with conventional single-lamp light sources. Instead of only illuminating the ground, the new optic distributes light uniformly over a 60-degree field while keeping the beam at 30 degrees below horizontal to meet dark sky demands. This, too, is a never-before-possible byproduct of LED technology.

In traditional wall packs, the lion’s share of the light shines directly downward because of limited optic control. That leaves the space between fixtures largely in shadow. The patent-pending optical system developed for the SUNDOWNER LED family leverages the smaller LED point source and directional capabilities of semiconductor-generated light to broaden the beam pattern like a floodlight for partial wall coverage. This yields:

- Better visibility at wall level, increasing comfort and safety for passersby.
- Increased efficiency due to use of light traditionally blocked by the housing.
- A 30% reduction in fixturing needs since a single luminaire can light a wider area.

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- Bob Catone
General Manager
Guth Lighting

While standard cut-off fixtures mounted 10 feet high must be spaced at intervals of 25 or 30 feet to achieve adequate coverage, the 12- and 20-LED SUNDOWNER products can be placed 35 and 40 feet apart, respectively.

For a new 300-foot building using 20-LED SUNDOWNER fixtures, that means 7.5 wall packs (300÷40) instead of 10 (300÷30). Those 7.5 SUNDOWNERS will consume just 262W of power (7.5 x 35W) instead of 2000W for a comparable wall pack (10 x 200W). This is where the energy efficiency of the SUNDOWNER LED series really pays off.

New Day for Night Lighting

Since unveiling the SUNDOWNER LEDs in May 2008, Guth has discovered a variety of additional applications for the product. Used as uplights, for example, the LUXEON-based fixtures can illuminate highway signs with an 18-year maintenance cycle. Since changing a metal halide light bulb on a highway every two years is very costly, Catone expects to do a brisk business in this market.

Even sticking to standard wall pack applications, however, Guth stands to reap the rewards of bringing its SUNDOWNER luminaires into the LED era. The new line's ability to reduce the maintenance, energy and fixturing needs of standard wall packs puts Guth on course for wide market adoption. The products may be designed for after dark, but they promise to shine brightly on Guth's balance sheet.



LUXEON Rebel Benefits for Guth SUNDOWNER

- 18-year lifetime
- 80% energy savings
- High flux
- Multiple drive currents for different SKUs
- Color consistency
- Wider light projection with custom optic
- 30% fewer fixtures needed
- Supports green initiatives
- Easy adaptability for new applications

Optic Partners

In developing the proprietary optic for its new SUNDOWNER LED series, Guth Lighting called on two expert resources to ensure peak performance.

Midwest Circuits (www.mcleddlighting.com) worked with Guth to determine the configuration of the LED array, including the strategy for spreading the beam and the number of LUXEON Rebel LEDs required to produce sufficient light output; designed a custom heat sink; and built Guth's new light engine on proprietary Midwest circuit boards tailored to LED thermal requirements.

Future Lighting Solutions (www.futurelightingsolutions.com), the exclusive supplier of LUXEON LEDs and a provider of LED solution support services, performed optical modeling to simulate the light distribution that would be produced with Midwest's suggested configurations and refine the design to achieve the desired beam pattern.

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