

LED LIGHTING SAVES ENERGY AND ATTRACTS SHOPPERS

Emerging Lighting Technology for Retail Stores

Published Monday, December 3, 2007
by Lighting Research Center

Retailers looking to add dazzle to their store window displays may want to consider colored LEDs, or light-emitting diodes. A field study from the Lighting Research Center (LRC) discovered that colored lighting effects created with these tiny lamps can cut lighting energy in retail windows by 30 to 50 percent and attract more attention from shoppers.

Retailers use lighting in display windows to illuminate merchandise, attract attention, and even send a message about the quality of their store. To get the most impact, Dan Frering of the LRC says stores often use plenty of high-wattage accent lights to highlight mannequins and merchandise. "This creates visual interest and makes the merchandise stand out from the background," he says. This technique is effective but when used 12 or more hours every day, the energy consumption and costs can climb. The United States Department of Energy says lighting is the biggest energy expense for retailers, accounting for 37 percent of total energy use in U.S. retail buildings.

This energy problem could be eased with new types of efficient lighting now taking off. The LED, a tiny semiconductor that emits light in a range of vivid colors, is commonly found in traffic signals, exit signs, and electronic displays, but recent improvements have prompted lighting specialists to look at new ways to use LEDs for illumination. The potential benefits, including better efficiency and longer life (up to 50,000 hours, or 40 times longer than conventional incandescent lamps), have catalyzed global research efforts in LED and solid-state lighting technology. Colored LEDs, in particular, have become popular as an architectural and display lighting option because they offer flexibility to designers and consume half the energy of traditional incandescent sources with color filters.

The Los Angeles Department of Water and Power (LADWP) sponsored the LRC field study to determine whether energy-efficient, colored window lighting could draw the interest of

shoppers, reduce energy consumption in store windows, and maintain or improve retail sales. LRC researchers installed custom, slim-profile LED fixtures in the windows of three stores owned by a popular clothing retailer found in Los Angeles area shopping malls. To cut energy consumption by 30 to 50 percent in each window, they eliminated all general fluorescent lighting, reduced the number and wattage of halogen accent lights, and added LED systems to create colored backgrounds for interest. The researchers tested different window display and lighting scenarios over an eight-week period and surveyed shoppers about the attractiveness, visibility, and eye-catching ability of the windows. (Lighting inside the stores remained unchanged.)

Frering says, “We designed the window lighting to create impact and contrast with color, instead of high light levels. This allowed us to reduce the amount of accent lighting and cut energy use.”

After eight weeks and more than 700 surveys, the results showed that the colored LED lighting was a hit with shoppers. They preferred the colored LED window with a 30 percent reduction in power over the typical high-energy lighting design. The survey results also showed:

- * 74 percent of shoppers found the new lighting design to be eye-catching.
- * 84 percent agreed that the LED display windows were visually appealing.
- * 91 percent confirmed that the reduced accent lighting did not diminish the visibility of the window mannequins and merchandise.

Cutting the lighting power consumption further to 50 percent in each window resulted in no significant difference in shoppers’ opinions compared with the typical lighting, and a lower opinion compared with the 30 percent reduction.

Sales data gathered by the retailer showed no significant change in sales at the three test stores during the study period, even with a 50 percent reduction in power consumption. Sales were compared with the same weeks for the previous year and with comparable stores owned by the retailer.