

## LEDs Finally Hitting Stride in Supporting Health, Productivity

*By allowing tunability of color and intensity, USAI's Color Select LED technology can match the natural daylight cycle and needs of end users.*

*By Brent Ehrlich*



Color Select allows color temperature tuning of patient rooms for different end uses, such as examinations and recovery. The image shows renderings of the same room at 2400K, 3800K, and 5500K at intensities of 50%, 75%, and 100%, respectively.

*Images: USAI Lighting, LLC*

LEDs are a digital technology: they rely on semiconductors to emit light, the same tiny computer chips that are used to light many smart phones. But our use of this lighting platform to realize health benefits in interior design hasn't been very smart.

By adding tunability of color temperature to the efficient, flexible platform already offered by LEDs, manufacturers are now turning a corner in lighting design that has taken hundreds of years to reach.

### ***Tunability: The missing ingredient***

The wrong light color can affect our moods, disturb our circadian rhythms, and make interiors, food, retail goods, art, and people look terrible. We experience this every day with fluorescent lighting that can give skin a greenish hue, and the most energy-efficient LED products that, while more attractive, tend to be bluish and disrupt healthy sleep patterns.

With a digital lighting platform, why can't we have the color and intensity of lighting that we need, when we need it?

Philips, Juno, and others are now starting to offer tunable lighting that allows lighting designers some options for partially matching lighting with mood, setting, time of day, and end use. USAI Color Select LED technology—found in BeveLED 2.0 and BeveLED Mini product lines—takes this concept a step further, creating a system that allows white light to be tuned to color temperatures along the full daylight spectrum.

## ***Adjusting color temperature and intensity***

Launched in the spring of 2014, USAI Lighting's Color Select technology allows color temperature tuning and dimming of its white LEDs "from 2200K to 6000K while dimming from 100% down to 0.1%," according to Sean Gaydos, USAI Lighting's vice president of sales. "We can shift the color, giving total control over the fixture." He claims that having that range gives the lighting the flexibility to create a full morning-to-night visual spectrum, with the low 2200K being even warmer and closer to the color temperature of candlelight.

The BeveLED 2.0 and BeveLED Mini can be selected with a color-rendering index (CRI) of either 80 or 90, allowing for better light quality when needed, with efficacies ranging from approximately 50 lumens per watt (lpw) when adjusted to the warmest colors up to 90 lpw for the coolest temperatures, which are standard for high-quality LEDs (warm lighting is always less efficacious because more phosphors are required to convert blue light to yellows and reds). Available as downlights, adjustable downlights, and wall-wash products in a variety of shape and trim options, Color Select luminaires can be selected with 2.5- to 6.0-inch apertures and adjustable beam spreads, providing anywhere from 600 to 6,000 lumens, so they can be used in ceilings from 8 to 30 feet tall while still taking advantage of tunable color.

## ***In control***

Because it is "platform independent," almost any lighting control system can be used with Color Select, according to Gaydos, from simple two-switch systems where occupants control color with one switch and dimming the other, to advanced daylighting controls where the light color and intensity adjust automatically throughout the day. USAI has tested the compatibility of the system with most major control systems to ensure they work with its drivers so the LEDs don't experience flicker and other problems. Still, as with any LED system, it is important to try it first and work with the manufacturer to ensure it functions as intended.

Because Color Select requires two drivers (one for color and one for intensity), additional wiring is required, adding to installation costs, but Gaydos plays down this estimated \$75 additional cost per fixture. When one considers the added capability, and that one lighting system could replace separate lighting systems and their associated design and installation costs (such as a restaurant with different lighting systems for daytime and evening), Color Select can fit within most lighting budgets.

### ***The sky's the limit***

Color Select was developed for the healthcare industry, according to Gaydos, but the company has had residential customers adopting it because of circadian rhythm benefits; the tech industry is using it to improve productivity; and galleries are using it to provide varied lighting needs for art exhibits.

Matt Leveque, founding principal of the lighting design firm Full Circle Design in Newport Beach, California, used Color Select on a renovation project at the Island Hotel restaurant, lounge, bar, and market. Leveque was able to provide a cooler light for business diners at lunch and warmer candle-glow for nights and weekends while adjusting the lighting to help the partially daylight space feel connected to the outdoors, and he could even fine tune the color to highlight the space's art. "By picking the kelvin temperature and having that programmed throughout the day, we could change the expression of the restaurant or lounge per the client's desires," he said. "The client loves it," says Leveque. They might not be able to explain color temperature down to the kelvin (for a quick primer, see our sidebar), but "they enjoy how it looks during the day and how the mood changes at night," says Levesque.

Using the Color Select technology was "a real joy as a lighting designer," adds Leveque. "We have to forget the halogen and CFL approach and ask what can this technology [LEDs] be doing, because we are limiting ourselves," he said. "You suddenly realize how archaic everything else is," he said. "Once you use this, it is kind of hard to go back."

For more information:

USAI Lighting  
[www.usailighting.com](http://www.usailighting.com)