

Vitasolis™

Optisolis™

2-in-1 Tunable LED



Retail: Light **so** Good

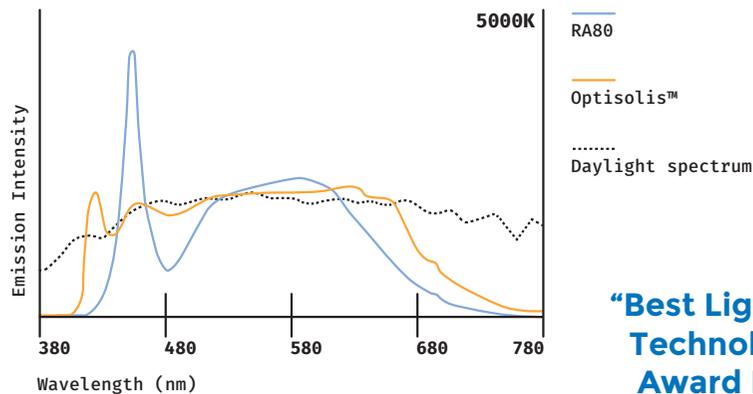
Nichia's guide on how to deliver better lighting in retail spaces

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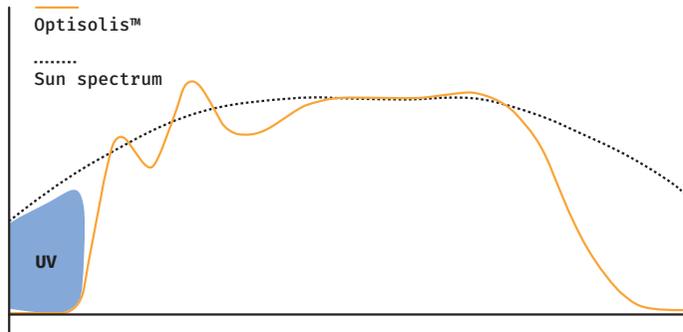
INTRODUCTION:

When it comes to boosting sales in brick-and-mortar retail stores, the importance of good lighting is often undervalued, and the illumination inside such spaces is commonly unfit for purpose. Whether they are located in city centres or out-of-town shopping malls, many retailers typically focus on factors other than lighting to shape the customer experience.

Of course, retail managers have plenty to consider when it comes to retail store design and improving the customer experience. Some examples include the customer flow layout, store fixtures and displays, visual merchandising, exterior window displays, and space management of seating, checkout areas, and back-of-the-house operations. Indeed, there are so many crucial strategic design considerations; it should come as little surprise why lighting can frequently be considered less critical to delivering retail success.



“Best Lighting Technology Award LPS 2018”



Delivering good lighting deserves greater attention

Good lighting is more than just making sure the customer can see and interact with the merchandise. When designed and implemented correctly, lighting will help determine and influence the customer's mood while shopping. Store planners and designers can use LED lighting solutions to draw shoppers into specific store areas and create an amazing environment that aligns to the retail brand and merchandise.

Successful lighting should be evaluated by context and the goals a client is aiming to achieve. Does the project require general ambient light or illumination on specific products? Does the signage need illumination, or is visual merchandising a higher priority? Later in this guide, we describe how lighting specialists can illuminate specific areas of a store to maximize shopper comfort and explain how the latest LED technology from NICHIA can help deliver a holistic customer experience.

Before we move into specific approaches to improve retail lighting, it is worth underlining some fundamentals about illumination.

Lighting is one of life's brain teasers

During a recent retail lighting webinar hosted by NICHIA, Shopping Behavior and Neuroscience Specialist Dr Enrique Strelow noted that our reaction to light is a “learned behavior” dating back over a million years old.

“ Our brain tries to make sense of visual input processes which are based on very complicated algorithms. These inputs range from basic inputs like recognizing lines and stripes as well as contrast and colors to encompassing multiple layers of information and increasingly complex tasks such as object recognition.

Dr Enrique Strelow
Shopping Behavior
and Neuroscience
Specialist

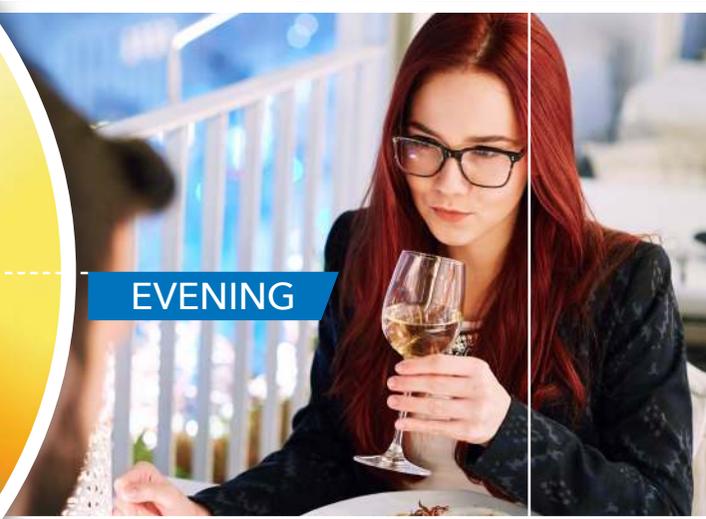




NOON



MORNING



EVENING



MIDNIGHT

2-in1 Tunable White LED for every day mode lighting.

Nichia's guide on how to deliver better lighting in retail spaces

WHAT FACTORS TO CONSIDER WHEN DESIGNING RETAIL LIGHTING

Lighting which connects brands with their customers

Marketing experts remind us that: “A brand is worthless if it doesn’t connect with the right audience in a relevant way.”

Good lighting design works in harmony with a well-thought-store layout to align with the brand and to deliver a shopping experience that resonates with new and existing loyal customers. For example, the wide-open spaces in Apple Stores are easy to navigate with well-organized displays outside the store. Without cluttered furniture and displays, there is a welcoming college classroom feel to every Apple store.

Visitors are not only gearing up to learn about Apple products, but they are actively encouraged to try the products. To encourage shoppers to stay for longer, the store windows are vast to let in as much natural light as possible while extensive use of backlit panels replicates soft, bright sunlight. Indeed, Apple’s patented ceiling lighting system design turns an entire ceiling of wall-to-wall lighted ceiling panels and linear light troughs into a massive diffused lighting apparatus.

Using different layers of light in different areas of a retail outlet

Lighting should be designed in layers. This approach can improve the customer experience by developing depth and contrast in-store. Layering light isn’t simply limited to installing spotlights into an area and then simply walking away. It involves carefully choosing appropriate fixtures for specific use while delivering flexibility for some fixtures to be adjusted. While some retail brands present merchandise on a longer-term seasonal basis, many other retailers require constant product replenishment and displays and signage that are more flexible and adaptable.

Different ambient levels of light need to be considered and contrast and uniformity become very important design factors. Excessive differences in brightness force the eye to readapt vision, which can increase discomfort and fatigue. While shifts in contrast in zones across a retail store can sometimes appear too jerky, inadequate differences in illuminance across separate areas can occasionally make stores seem mundane, dull and uninspiring. Clearly, there is a balancing act that needs to be addressed.

Moreover, the impact of feature lighting should also not be an afterthought. Good quality lighting designs should address the light contribution from digital media. Retail stores can have a considerable number of digital displays casting a fragmented and disjointed hue of light on merchandise on display as well as possibly producing direct or reflected glare into customers’ line of vision. Of course, lighting from signage must be taken into account too.

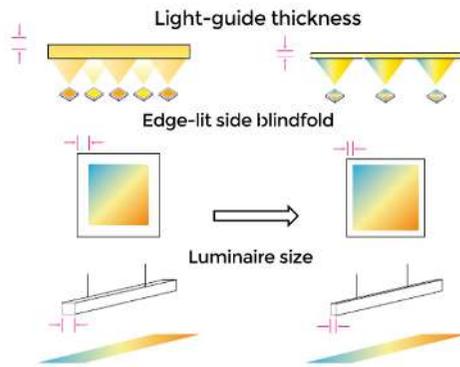
“What is vital when designing lighting for a retail space is to ensure that we create a foreground, a mid-ground and a background. That’s because the eye is always drawn to the brightest point so if we make the back of the retail space the brightest point, suddenly that store becomes more permeable, visually interesting and welcoming.”

Mr Paul Nulty
Founder of Architectural
Lighting Design
Consultancy, Nulty



“Best Lighting Sustainability Award LPS 2019”

2-in-1 Tunable White LED



- Easy color tuning and mixing
- Homogenous light distribution
- High color quality CRI ~90
- Single light emitting surface
- Smaller secondary optics
- New luminaire design options



Beware of illumination that's over-exaggerated

Designers are usually wary of introducing too much volume of light. There are subtleties and sensibilities to consider when adding light to create contrast and drama. Identifying how the light will be positioned - up, down, backlit, side-lit - will determine which lighting product is best to suit a client's needs.

Different fixtures can create a completely different mood. For example, a beautiful decorative pendant lighting is great to convey luxury and link to a relevant premium brand, but it can also interfere with display lighting, cast points of shadow and create a lot of visual clutter. A range of other lighting fixtures and diffused lighting in the adjoining area could help to counteract this impact and deliver a balance in uniformity.

Ultimately, retail management is more about controlling the attention of consumers and pulling them in towards particular areas of a store and encouraging them to notice and interact in particular spaces with products, signage, offers, etc. Besides keeping customers focused in a particular area of a store by applying the correct volume of quality light, it is important to understand the surfaces being used in retail stores. Light is actually only seen when it reflects on surfaces, a fact which shouldn't be underestimated. Given that different types of surfaces interact with light in different ways, the

choices of material finishes can add considerable depth and sophistication to lighting design.

There is a multitude of fixtures to choose from with a diverse range of lighting effects. From track lighting and surface mounted fixtures, to adjustable, recessed and eyeball down spots. From pendants and reels, to suspended hanging fixtures and full room luminous ceilings. The level, direction and distribution of illumination which each solution offers is usually unique.

“Best Product Award LpS Digital 2020”

Adjust the color temperature to adapt to circadian rhythm.

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GETTING THE BASICS RIGHT: OPTIMIZED LED SOLUTIONS FOR RETAIL

A recap on the benefits of LED lighting

The exceptional operational lifetime stands out as a critical benefit of LED lighting and it has also proven to be a highly efficient light source considering its compact size, and ability to convert electrical energy to light without producing excessive heat (making it highly suitable to illuminate heat-sensitive products from shorter distances to the light source). Efficiency-wise, LEDs can now deliver a performance of more than 200 lumens per watt, which reinforces just how much visible light you get for less power than other light sources (such as incandescent and compact fluorescent lamps).

The appropriate LED lighting solution can change the complete look and feel of a display or entire retail space. LEDs tend to be an attractive choice for point-of-purchase (POP) displays, signage and store fixtures because of their energy efficiency, low voltage requirements, cool-to-touch surface, and compact form factor integrated into fixture designs - especially when compared to other lighting options.

LEDs likewise offer the capacity to control brightness and produce various color schemes. Retailers can utilize them to set up various subjects through different store areas - going from dark and mysterious to radiant sunshine to link closer with a brand or promotional season.

Shoppers will be delighted with adequate brightness

When choosing between LED fixtures, it is worth inspecting those that can deliver high brightness performance (lumen output) while maintaining efficacy (lumens per watt).

Different retail spaces will require different levels of brightness. For overall brightness levels in areas with product displays or payment counters, lighting designers can use a spectrometer to measure illuminance and adjust it according to requirements. In retail spaces, designers often work with conflicting amounts and different types of lighting. When determining brightness levels, retail lighting experts should factor in the lighting from associated fixtures on the sales floor, signage, promotional displays, as well as natural light from windows and doors.



CRI performance

There are many parameters that can have impact how color is perceived including light source, size of objects, background or surrounding color, and surface materials. Of course, many of these factors are out of the control of retailers.

However, the Color Rendering Index (CRI) of LEDs is something that deserves closer attention. CRI is used to represent how well a light source renders the colors of objects that it illuminates. A measure of CRI 100 is the maximum measurable value and equivalent to daylight. For best performance, the minimum recommended CRI for general LED lighting and direct lighting applications is typically 90+, whereas backlit and indirect lighting will require CRI 80+. A high CRI can reflect how merchandise will be perceived, helping products to appear fresher and the stores brighter.

CRI can only represent colors R1 - R8 and omits important R9 and R13 content. Red is the hardest color to render appropriately, so a high R9 value is often sought out by designers when an application requires a higher sensitivity to color accuracy. For instance, when raw meat in grocery stores has a blue hue, this issue is often due to poorly designed lighting. Although LED lighting featuring a R9 over 50 will render the color red relatively well, sometimes this comes at the expense of the light's luminous efficacy.

Efficacy and lifetime maintenance

It is important when designing an illuminated retail store fixture to plan for any potential maintenance and repair of the lighting fixture. The long lifetime of LEDs reduces the need to replace failed lamps, and this can lead to significant savings, particularly in the cost of sending out maintenance teams to retail. This also makes LED fixtures useful for installation in relatively inaccessible locations.

A LED module's lifetime is defined as the time it takes until its light output, or lumen maintenance, reaches 70% of the initial output. This is also called L70. In other words, the module does not fail instantly as many conventional light sources do, it slowly dims down.

However, there's more to LED technology advantages than brightness, efficacy and lifetime performance. Read on to learn more.



Easy color tuning and mixing.

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BEYOND THE BASICS: THE FOCUS FROM NICHIA ON PRODUCING “LIGHT SO GOOD”

There's more to LED technology advantages than brightness, efficacy and lifetime performance.

'Light so Good' is a mantra that reaffirms NICHIA's commitment to delivering an optimum level of light which is functional and versatile for different applications.

Retail lighting has specific needs. NICHIA has produced a ground-breaking range of LED technologies that move beyond straightforward product illumination. Lighting fixture manufacturers are integrating the solutions into luminaires to address these requirements and enhance the customer experience. The solutions enable lighting designers to produce a quality of light to elevate the customer experience (enhancing shoppers' brand connection and the emotional response).

Before installation of NICHIA's Optisolis and 2-in-1



2-in-1 Tunable White provides design flexibility and decorative flair

NICHIA's pioneering 2-in-1 Tunable White LEDs accomplish color tuning within a small, single light-emitting surface (LES), achieving superb color uniformity with high color quality (up to 90 CRI). The innovative mid-power LED eliminates the need for bulky light guides and mixing chambers and enables luminaire manufacturers to improve color tuning, shrink optics and develop sleeker fixture profiles while allowing new design options.

Available in a mid-power 3030 package, this tunable white technology allows customers and the industry to focus on the benefits of the light instead of just energy savings, which already far surpass that of traditional technologies.



NICHIA's 2-in-1 LED allows for elegant color tuning because everything is under a single LES; this can be seen easily in edge-lit solutions.

Currently, luminaire manufacturers must use two LEDs in side-by-side to achieve color tuning. This solution creates unwanted optical distributions and visual effects while also limiting the lumen output that can be achieved in a single luminaire. Now, luminaire manufacturers can achieve the performance they need by integrating NICHIA's 2-in-1 LED.

A tunable white solution allows retailers to increase the visibility of promotional displays and special offers in stores by increasing contrast between the goods and the aisles, and smoothly adjust the color temperature during the day to the changing daylight to help boost the alertness of shoppers. There's more information on this benefit when we discuss our Vitasolis™ solution below.



Color recognition with full sun spectrum.

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OPTISOLIS™

Optisolis™ delivers more accurate UV-free representation of merchandise

NICHIA's Optisolis™ is the world's first LED and chip-on-board (COB) solution which has a spectrum closer to sunlight than any previously developed LED without harmful UV emission that can damage merchandise in retail settings (particularly printed materials, artworks, textiles and some fresh produce). In short, it illuminates objects in a more vivid and natural way.

With a CRI of over 98 at full intensity and exceptional R9 (red) content of 94, Optisolis™ is available from 2700–6500K color temperature and provides a high energy-saving efficacy at 134 lumens per watt.

In retail spaces, besides mimicking natural sunlight without potentially harmful UV what does Optisolis™ offer store owners? Firstly, it can help to provide a positive emotional response in shoppers by conveying the full-color spectrum. The vivid appearance through high CRI like natural sunlight provides an even more accurate rendering of objects. This is very important when selling beauty products like makeup, clothes and furniture. The colors of items are matched according to specific preference and to coordinate and complement with other items in customers' collections. Furthermore, Optisolis™ reveals the true colors of products in grocery retail, such as fresh fruit, vegetables, and meat. It has an exceptionally high color rendering index (CRI) of 98, compared with 80 to 90 for typical retail lights.

Contrast and emotion provided by the warm hug of the evening sun are enabled by natural sunlight or the Optisolis™ from NICHIA which is very close to matching natural light, according to shopping behavior expert Dr Enrique Strelow.

Color recognition - FULL SUN SPECTRUM



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Natural and vivid appearance through HIGH CRI AS THE SUN

He explains: "Optisolis™ is being used in Edeka stores in Wiesbaden and it helps to recreate the emotion of the evening sun and gives fresh produce the best possible appearance."

For supermarkets like Edeka, one of the largest supermarket chains in Germany, the lighting techniques' repertoire includes the 'meat lamp', which brings a reddish glow to the butcher's counter, making cuts look fresh, juicy and appetizing. At the fish counter, bright, cool lights reflect the shine of freshly caught seafood and the sparkle of ice. At the same time, carefully devised lighting in other areas subtly draws the attention of clientele to promotions or essential items. Even outside the store, window display lighting schemes help attract shoppers' gaze, tempting them inside.

Improved well-being through comfortable illumination is an essential factor, equating to increased sales as customers are encouraged to stay in-store to shop for longer. According to a recent study conducted by the Fraunhofer Institute for Building Physics in Germany, full spectrum LEDs provide higher naturalness and higher ratings of comfortability than the standard LEDs.

...gives EMOTION



Improved well being through comfortable illumination.

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VITASOLIS™

Vitasolis™ providing customers with vitality and energy while shopping

With LED technology continuing to advance, retailers have begun to look beyond established benefits such as energy efficiency and to consider what more can be achieved with light. For instance, the ever-improving color range and controllability of LEDs means they are increasingly being deployed to heighten both visual and emotional appeal. And now, thanks to step-changes in science, retailers can add a third dimension to the impact of light: the biological effect.

Nichia's proprietary Vitasolis™ LED technology stimulates the body and its circadian rhythm in the same way as natural light. It is well documented that lighting influences activity levels throughout the day, including waking up in the morning, being active during working hours, and sleeping well at night. Although Vitasolis™ provides a very natural white color, part of its spectrum contains a more considerable amount of energy in the cyan region, which is known to help control human circadian rhythms.

Many artificial white light sources found in shops do not contain sufficient cyan to stimulate the body. In contrast, the enhanced cyan element present within the spectrum of Vitasolis™ (at 490nm wavelength) opens the door to human-centric lighting solutions that promote well-being and alertness, reduce tiredness and stress, and elevate mental performance. Vitasolis™, with its broad color spectrum, also improves the response of the eyes to light, reducing strain.

Crisper white for brilliant product placement - **CONTRAST AND VISIBILITY**



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Vitality for store workers and shoppers - **ALERTNESS AND CONCENTRATION.**

Vitasolis™ achieves the optimum characteristics of light without losing energy efficiency. In comparison, standard LEDs can struggle to provide human-centric lighting solutions with a focus on cyan in their spectrum without sacrificing lumen efficacy. Put simply, Vitasolis technology enables users to benefit from energy savings provided by LED technology while combining the advantages of human-centric lighting.

Due to less yellow in the spectrum, white appears crisper and products more brilliant and the increased contrast and cyan boosts vitality and makes workers and shoppers feel better, more alert, and more able to focus and concentrate.

NICHIA can deliver dynamic, tunable LED lighting to those looking to get more from their retail environment. Consistent color is achieved across fixtures, which elevates different products or enhances branding experience, even across large spaces such as supermarkets. NICHIA's solutions can also replace the complex traditional lighting schemes often found in retail spaces.

Best Lighting Project TiL 2019

LEDs Magazine Sapphire Award for Packaged LEDs and OLEDs 2020

...brings INSPIRATION



Improved “shopping endurance” - ENHANCED SHOPPING ENJOYMENT.

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Vitasolis™

Optisolis™

2-in-1 Tunable LED



Success in retail depends on forging a strong connection with its customer base. NICHIA's LED solutions are proven to support this objective. They can successfully be deployed separately or together as part of an integrated lighting toolkit.

To learn more, contact us today info_de@nichia.eu

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