



IntelliHue

The smart way to deliver white and color light

Technical Overview



Photography: © Jeffrey Totaro, 2016

IntelliHue

Perfectly accurate color and white light from the same luminaire

Color Kinetics IntelliHue brings high output, CRI, and quality to both white and color LED light – all in a single advanced, affordable luminaire. Our groundbreaking color-control technology lets you target and adjust millions of colors and shades of white light with pinpoint precision.

Multiple LED light sources combine to produce a full spectrum of precisely controllable light, all with unrivaled color accuracy across the entire range of color temperatures. Available in a wide range of form factors, IntelliHue luminaires can be used for grazing, washing, spotlighting, and other applications. Chromasync technology (available on all IntelliHue lighting systems) takes IntelliHue LED luminaires even further, delivering excellent color precision and accuracy.

IntelliHue delivers:

High Output. IntelliHue luminaires achieve high output (flux), bringing new impact to a wide range of lighting designs, interior and exterior.

Exceptional Quality. IntelliHue achieves higher CRI compared to RGBA and RGBW luminaires, ensuring high-quality white and color light.

Precision Control. IntelliHue uses Chromasync technology to provide a high level of color consistency (<2 SDCM) that renders color variations virtually imperceptible across multiple luminaires.

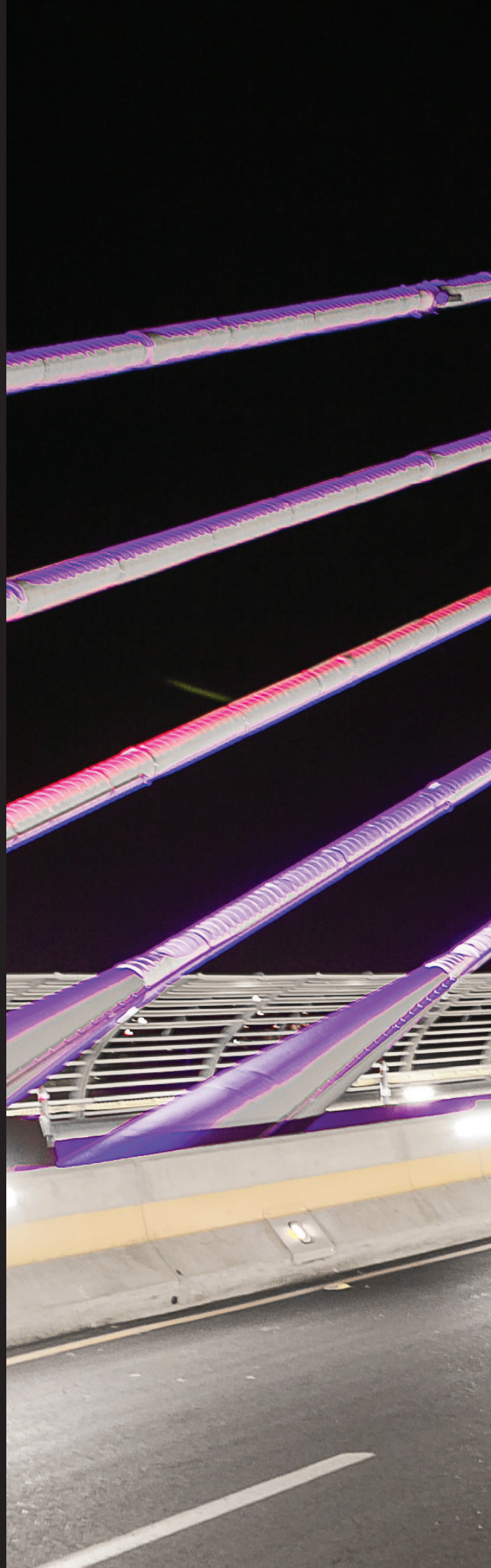
Flexibility. IntelliHue delivers high-quality tunable white light and color-changing effects in the same luminaire, bringing new flexibility to locations that require both, from multi-function halls to public monuments.

Lower Complexity and Cost: IntelliHue reduces control costs (since a single system can control all types of light), reduces the need for extra circuits, and lowers overall commissioning time and cost.

A lighting system designed for impact and efficiency

IntelliHue luminaires meet the pressing needs of today's lighting professionals, who want to create exceptional high-impact lighting implementations, while reducing complexity and boosting efficiency. Advanced IntelliHue luminaires fit seamlessly into every implementation, from office interiors to extensive exterior projects. And IntelliHue luminaires are proven and reliable, already bringing impressive white and color light to a wide range of implementations.

High output and CRI, remarkable flexibility, and efficiency — that's why IntelliHue is the smart choice for advanced white and color LED lighting.



IntelliHue advantages



Photography: © Signify Latin America

Color Kinetics IntelliHue 5

IntelliHue: Superior color mixing

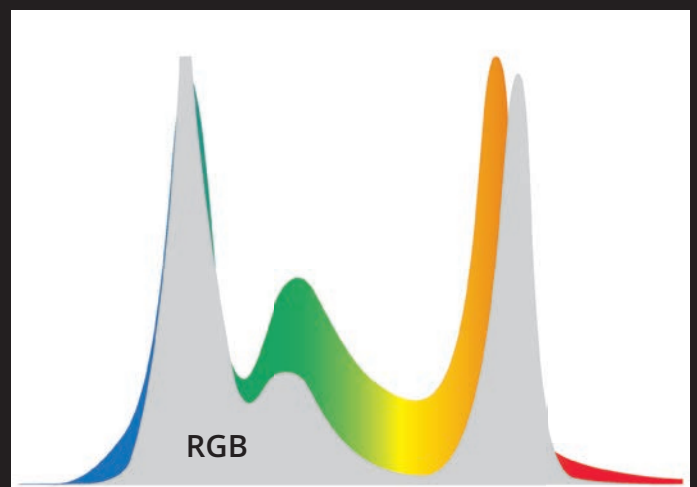


Get attention with high output

IntelliHue luminaires provide higher flux and CRI than comparable RGBW or RGBA luminaires.

With IntelliHue, lighting designers can be confident that the luminaires they specify will deliver high illuminance at the chosen target, whether it's close (an interior wall) or far away (an exterior architectural detail). These results are especially impressive when compared with RGBW or RGBA solutions. IntelliHue luminaires maximize output, putting light where designers want it.

The Chromasync color control algorithm outputs the maximum possible flux based on the color command by managing how best to use multiple channels and color LEDs inside the luminaire. The result? IntelliHue achieves high output in all implementations.



IntelliHue luminaires expand the possible output wavelengths significantly—especially when compared with traditional RGB output. And no matter what wavelength you choose, IntelliHue delivers high illuminance.

Achieve your creative vision with IntelliHue

With IntelliHue, you get a high level of control and flexibility when selecting and adjusting color, especially shades of white light.

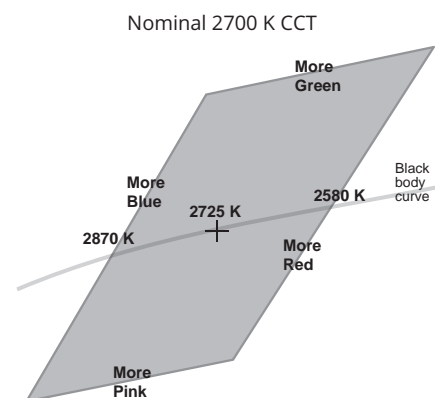
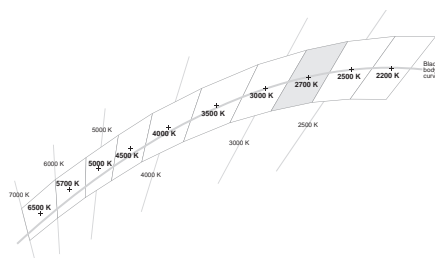
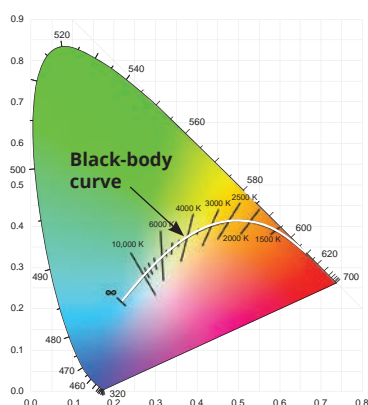
IntelliHue luminaires provide the exact hue that you want and hit any tint of white. Now you can choose the right white for your needs, without compromises. With IntelliHue, your vision holds true from design to commissioning.

IntelliHue gives you a broader selection of white light options and greater control. For example, ColorBlast IntelliHue Powercore gen4 luminaires deliver white ranges from 2000 K to 10000 K along the black-body curve/locus¹, and 0.025 Duv above and below it.

In practice, this broad range of choices means that you can control IntelliHue luminaires to target and precisely adjust white points across and beyond the entire ANSI white range, choosing from a wide range of white lighting options. At one end of the black-body curve, you can select super-warm candle flame and reddish firelight shades in the 2000 K to 2500 K range. At the other end of the black-body curve, you can select super-cool daylight and blue zenith sky shades in the 7000 K – 10000 K range.

You can also precisely tint white points by moving them above and below the black-body curve. This unparalleled freedom in producing white light allows you to match the hues of other lighting sources (e.g., fluorescent), create pastels, and produce the exact custom shade of white you want to achieve your creative vision.

¹ Of the CIE color space.



Each nominal CCT has an allowable range of variation (tolerance) both along the black-body curve and perpendicular to it.

Specified variations in CCT and Duv define a quadrangle within the color space for each color temperature.

Variations that lie along the black-body curve, measured in degrees Kelvin, make a light source appear more reddish or bluish. Variations above and below the black-body curve, notated in Duv, make a light source appear more greenish or pinkish.

The quadrangle for nominal CCT 2700 K, for example, is centered on 2725 K, and extends 125 K left and right along the black-body curve and 0.006 Duv above and below the curve.

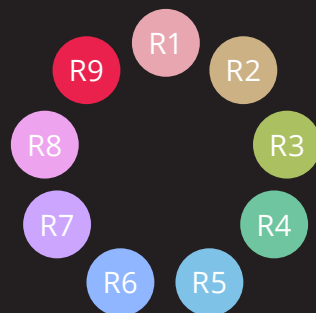
Ensure accurate color rendering with high CRI

IntelliHue LEDs are carefully selected for superior color rendering (CRI)² in the white range and fine control of color, color temperature, and tint.

IntelliHue's 80+ CRI lets it render color objects with high fidelity to the reference source. After all, delivering good quality white light that looks great on a white wall is relatively simple. But to ensure that color objects (e.g., retail goods) under that same light look as natural as possible, you need the high CRI that IntelliHue delivers.

A CRI of 80 or higher is an important benchmark for a wide range of lighting implementations, such as restaurants, high-end retail spaces, and other interiors. IntelliHue luminaires exceed this rating. IntelliHue's high CRI makes it an attractive choice for demanding white light applications, while its impressive color capabilities expand the possibilities even further.

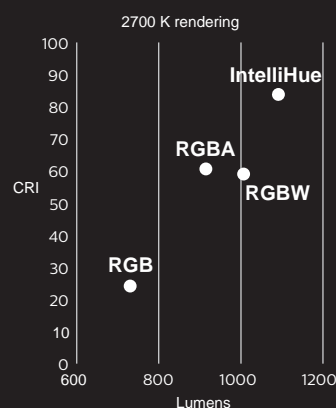
² CRI measures the ability of a light source to reproduce the colors of various objects faithfully in reference to an ideal light source. The index rates the quality of a light source on a scale up to 100. In practice, the color rendering abilities of all light sources differ from the ideal reference source to a greater or lesser degree. The more their color rendering differs, the lower their CRI score.



Excellent R9 rendering

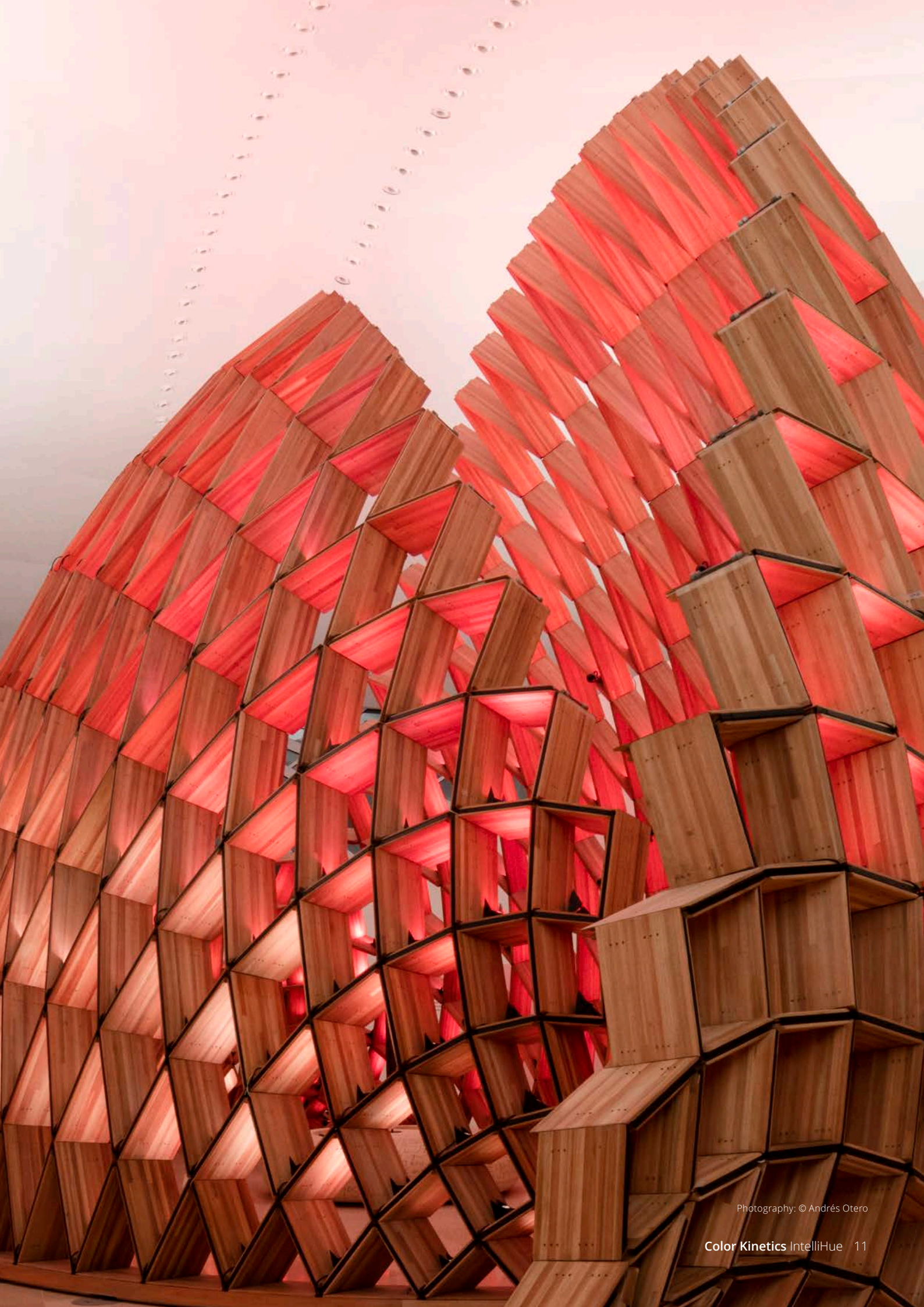
IntelliHue offers very natural red rendering, with an R9 value up to 88 – higher than white LED or fluorescent lighting, and closer to the R9 values offered by the ceramic metal halide and halogen lighting often used in retail. This higher R9 value makes IntelliHue appropriate for a broad range of applications in retail and beyond.

The combination of carefully selected LED sources used in IntelliHue luminaires can deliver tunable white light with high CRI across a range of color temperatures.



Excellent (not just good) white light

For some implementations, good white light is acceptable. But more and more designs call for great white light. Single-channel LED lighting luminaires, such as Essential White luminaires, can produce good-enough white light, but they can't be intelligently controlled – they can be switched and dimmed only. Multi-channel LED lighting luminaires, such as RGBA and RGBW bring more control to white light, but at significantly lower output and CRI. IntelliHue delivers no-compromises light with precision control – achieving both the chosen white light point, as well as exceptional color rendering.



Photography: © Andrés Otero

**Combine
high-quality
white light
& saturated
color**

IntelliHue luminaires offer unparalleled design flexibility and control over the lighting environment.

IntelliHue luminaires offer many benefits, from expanding your creative possibilities to reducing the complexity and cost of installation and maintenance. They can illuminate spaces with highly uniform, high-quality, digitally adjustable white light to support a range of retail, hospitality, and other applications. And IntelliHue helps you transform spaces with intensely saturated, dynamic accent, and full-color effect lighting for dramatic presentations, theatrical atmospheres, and special occasions and events.

Meeting the needs of multi-function spaces

Many venues and public spaces are used for multiple purposes. For example, a public building or monument may require white light on most days, but color (or dynamic color) light on holidays. Or consider a multi-function facility that serves as an office by day (requiring high-productivity white light), and an entertainment venue by night, which benefits from dynamic color lighting.

How IntelliHue luminaires produce white light

IntelliHue luminaires produce high-quality white light points by combining output from channels of LED sources. It uses all LED sources to produce a specific white CCT, maximizing output and achieving at least 80 CRI on white CCT's.



ColorGrazing IntelliHue Powercore luminaires output exceptional white light for wall grazing and other applications.

IntelliHue— right for a wide range of applications

IntelliHue luminaires are the smart choice for a wide range of interior and exterior applications.

With IntelliHue, you can do it all in one flexible, reliable luminaire. Here are just some of the ways that IntelliHue luminaires can make a real difference:

- Go beyond the capabilities of traditionally low-quality, low-CRI light sources.
- Make brick and other exteriors pop.
- Ensure that greenery and other challenging outdoor settings look great.
- Keep building façade colors more consistent and accurate.
- Transform interior spaces into multi-purpose, multi-functional facilities – increasing use and profitability.



IntelliHue white-light applications

You can fine tune the white-light output of IntelliHue luminaires for an array of effects and applications, including:

- Matching the hues of fluorescent and incandescent lighting sources in an installation.
- Blending lighting with daylight, or following the daylight cycle from cooler color temperatures in the morning to warmer color temperatures in the evening.
- Allowing occupants of a space to adjust the color temperature, tint, and intensity of lighting to increase comfort and productivity.
- Adjusting the color appearance of light for changing retail displays, or to encourage desired occupancy behavior in indoor spaces.

IntelliHue color and dynamic color applications

- Outdoor public spaces that require both white and color capabilities.
- Lighting the subtle pink marble façade of a historical building so that it matches daylight viewing conditions.
- Indoor spaces that use color light during the day, and white light for cleaning.
- Art galleries and installations that use white and color light to illuminate artwork, providing two different impressions of the same artistic work.
- Wayfinding during events and in large facilities, where white and color light can be used effectively at different times.



Unprecedented color consistency with Chromasync

Our Chromasync technology delivers improved color consistency from luminaire to luminaire by precisely adjusting the color point.

Consistency

Chromasync allows the IntelliHue family of luminaires to achieve high color precision with a color variation of less than two MacAdam ellipses across multiple luminaires.

Color Accuracy

Chromasync enables lighting designers to pick a specific Correlated Color Temperature (CCT) via the Color Kinetics software and ensure accuracy – achieving their vision, protecting brand consistency, and much more.

Maximum Output

Chromasync ensures consistency, but also optimizes the luminaire for maximum output for the chosen color point, as well ensuring consistently high output for specified colors.

Speed

Chromasync simplifies and speeds commissioning by replacing time-consuming adjustments with an automated process integrated into the lighting solution and controller.

Flexibility

Chromasync is controller-agnostic and works with 3-, 4-, and 5-channel controllers, including those from Color Kinetics as well as third-party controllers. It only requires a 3-channel controller to operate 3-, 4-, and 5-channel luminaires when Chromasync is enabled in 3-channel mode.



Photography: © Darius Kuzmickas

Color Kinetics technology portfolio

We continually explore your challenges, invest in research and development, and make the significant commitment required to develop and perfect breakthrough technologies. The result of decades of work, our unequaled portfolio of

proprietary, quality-enhancing technologies helps you achieve the best possible results. These technologies increase quality by ensuring sustainability, consistency, raising uniformity, providing precision control, and more.



Optibin

Where consistency begins.

Our LED optimization technology begins the color consistency process by grouping (or binning) LEDs by flux as well as center wavelength. This proprietary binning optimization process uses an advanced bin selection formula that exceeds industry standards for chromaticity. The result? Higher uniformity and consistency of hue and color temperature for all our luminaires.



Chromasync

Optimize output & color consistency.

Our advanced output optimization technology controls and boosts output while ensuring color consistency. When enabled, Chromasync ensures excellent color consistency between luminaires, without manually adjusting color points on each luminaire.



IntelliHue

The smart way to deliver white & color light.

Our advanced approach to color mixing produces high-quality white light, subtle pastels, and fully saturated colors in the same precisely controllable luminaire. All with unrivaled color accuracy across the entire range of color temperatures.



OptiField

Uniformity never looked this good.

OptiField's freeform optic creates a breakthrough rectangular beam that covers large surfaces with full, bright, even light. And OptiField can cover more surface area with fewer luminaires — simplifying installation while lowering energy use.



Powercore

Power made simple.

Our patented approach to power output proves that simple is better. As well as faster, more efficient, and accurate. Powercore® controls power output to luminaires directly from line voltage. It merges line voltage with control data and delivers both over a single standard cable—dramatically simplifying installation and lowering total system cost.



FluxBoost

Unlock the full power of your luminaires.

FluxBoost is a breakthrough technology that optimizes power and quality. With FluxBoost, an installation can use more of the power budget allocated to the project, enabling significantly higher output, creating more saturated colors, reducing waste and increasing efficiency.

What matters in professional lighting?

Our series of guides explores key topics in professional lighting—Color Science, Light Matters, Quality Matters, Optics Matter, and more. It's part of our commitment to passing on our deep technical knowledge and decades of expertise to help you achieve your vision.



Color Science

Color science serves as an underlying technical foundation for the entire lighting industry. It establishes a consistent way of thinking about light—how it is created, controlled, and delivered in real-world implementations. A core understanding of the science of color is critical to lighting professionals, who must be able to specify the right light—color, technology, luminaire, and more—clearly and accurately.



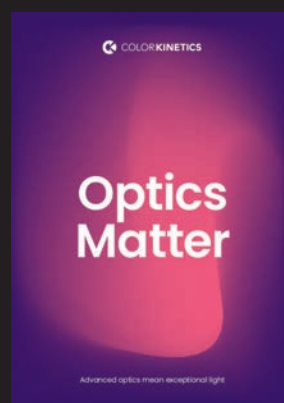
Light Matters

Traditional methods of evaluating light focused on lumen output, which was defined by the output capabilities of a light source, such as an incandescent lamp. The advent of LED lighting changed all that, since lumens were no longer the best measurement of a luminaire's capabilities. We explore some of the new ways lighting can be evaluated in the age of LED.



Quality Matters

What does quality mean to you? The answer depends on what you do within the lighting industry. Quality has different meanings for building and site owners/managers, lighting designers, and installers. We delve into the needs of each of these groups as we take a holistic approach to quality, one that begins and ends with the customer.



Optics Matter

It's safe to say that few lighting designers, building owners/managers, or other lighting professionals have ever seen the optical system housed inside an LED luminaire. But the optical system, or optics, play a vital, but often hidden role in performance, efficiency, and more. The right optics within a luminaire make a big difference in the final results—for both interior and exterior applications.

Choose the luminaire that meets your needs

The IntelliHue family of advanced LED luminaires includes form factors for most applications, and it keeps growing to meet the evolving needs of lighting designers, interior designers, architects, engineers, and other lighting professionals.

The technology behind IntelliHue – from meticulous LED binning to advanced color control algorithms – is impressive.

To find out more about how to make IntelliHue luminaires part of your next lighting design, visit www.colorkinetics.com/IntelliHue



Photography: © Tomas Muscionico

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