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3500K	2175	1750	58	Mid Morning/Mid Afternoon	Compact Fluorescent
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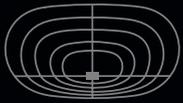
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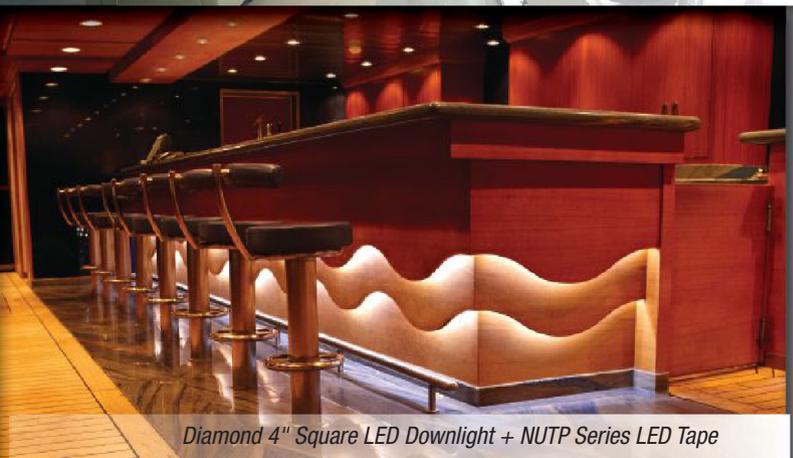
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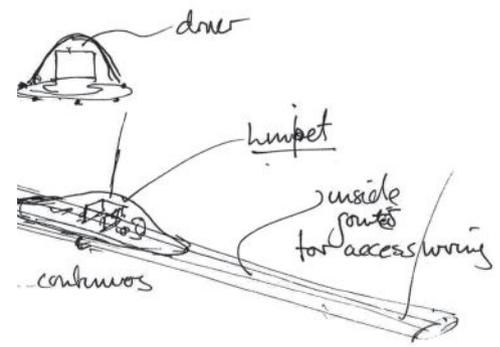
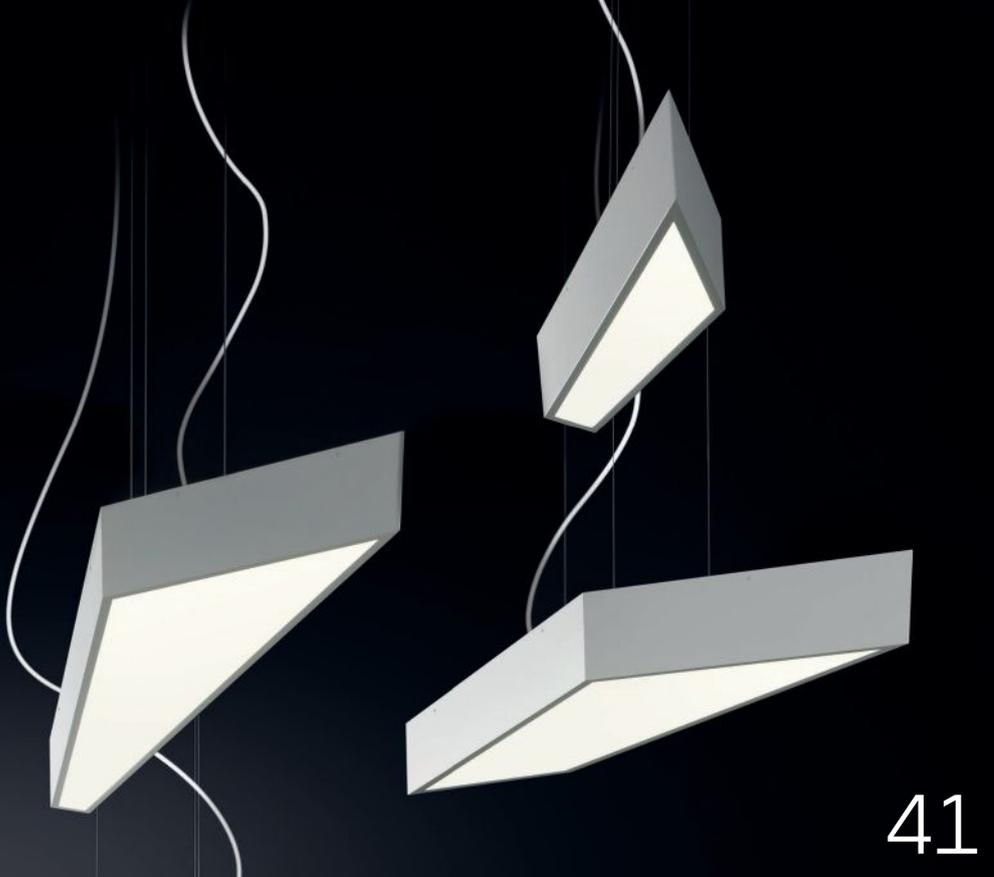
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**On the Cover:** Foscarini's Tuareg floor lamp. Photo courtesy Foscarini.

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As always, check our website for expanded article content, videos, and news. Also subscribe to our email newsletter, AL Notes, and find a link to ARCHITECTURAL LIGHTING's digital edition.

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Clockwise from left: Courtesy Axo Light; Courtesy Billings Jackson Design; Fran Parente



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# A MILESTONE FOR ARCHITECTURAL LIGHTING, THE BRAND

**“We care deeply and passionately about the subject of lighting and about bringing our audience sophisticated, thought-provoking, insightful, and accurate information.”**

I'd like to take a moment and depart from the lighting-related discussion this column normally takes and share some news with you about an important editorial milestone for all of us here at ARCHITECTURAL LIGHTING.

On March 27, I attended the 2015 Jesse H. Neal Awards ceremony in New York City where AL was up for two awards—Best Newsletter and Best Media Brand—and I am delighted to report that we won for Best Media Brand. The Neal Awards, produced by American Business Media, are business journalism's most prestigious editorial honors. In a statement, the awards jury said, “ARCHITECTURAL LIGHTING offers consistent quality of content and presentation across every platform, creating a brand presence and image of superiority, taste, and intellect.” Having AL be recognized for our efforts across print, digital, and social media is a tremendous honor and a significant accomplishment. It is particularly rewarding to be recognized for the quality and range of our content.

Not unlike the lighting industry, the media world is undergoing a paradigm shift from analog to digital. The change brings a number of challenges, yet at the same time it's extremely exciting to envision new ways to prepare and deliver content to our audience. The possibilities seem endless, as we move beyond the standard print delivery and incorporate new platforms such as video and online interactives into our editorial portfolio.

We take the creation of content at AL very seriously. The editorial process is highly involved, and the design process encompasses the creative and the technical much in the same way a building or a luminaire is designed and built. The majority of our articles are developed months in advance to permit time for conducting interviews, writing, editing, fact-checking, gathering images, and creating online elements for the publication's website, [archlighting.com](http://archlighting.com). In fact the “design” of an article is probably more involved than it's ever been, as we map out print and online versions from the outset and coordinate what items are needed to maximize each platform's unique attributes.

AL's content also stems in part from the relationships we've formed with design firms and manufacturers. I am grateful for the time you make for AL when we reach out with inquiries and requests for interviews.

I have the great privilege of being the public face of this brand, but there is a very talented team of individuals who work with me and who support me in my endeavors. I'd like to take a moment to acknowledge the members of our editorial, art, and video teams: Jen Aranyi, Alice Ashe, Hallie Busta, Alexander Cortez, Ned Cramer, Lauren Honesty, Sara Johnson, Wanda Lau, Deane Madsen, Caroline Massie, Greig O'Brien, Robb Ogle, Cyprien Roy, Kaitlyn Rossi, Jessica Rubenstein, and many others. I also want to thank the core group of freelance writers that AL works with on a regular basis, including Elizabeth Evitts Dickinson, Bill Millard, Aaron Seward, and Gideon Fink Shapiro.

For the past 29 years, AL has played a unique role in the lighting community—as the profession's independent voice, at the leading edge of the lighting conversation. From print to digital to social media, AL engages with a worldwide audience working in lighting design and shaping the built environment to deliver the latest information about industry issues and trends, notable projects, and new products and technologies.

We care deeply and passionately about the subject of lighting and about bringing our audience sophisticated, thought-provoking, insightful, and accurate information. We know you have choices when it comes to what you spend your time reading. I believe that your time with AL is time well-spent. The Neal Award is validation of our work and a sign of our commitment to you, the lighting community.

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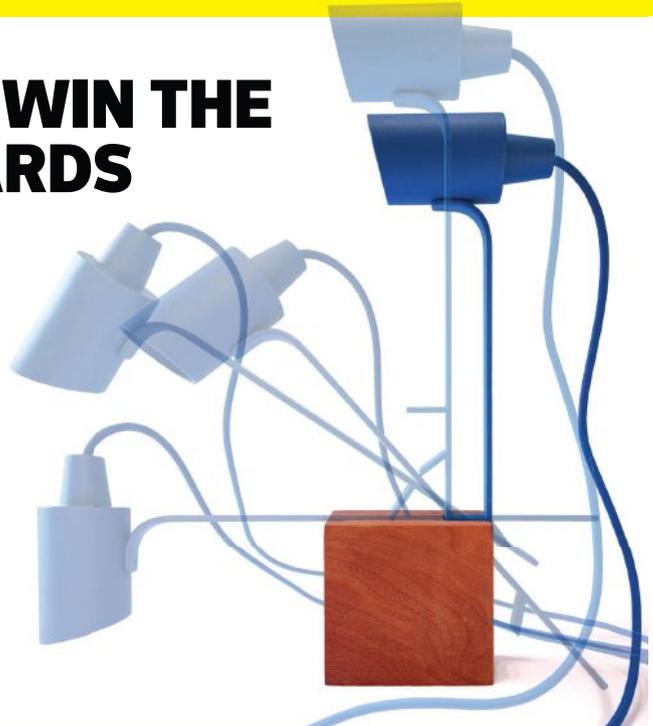
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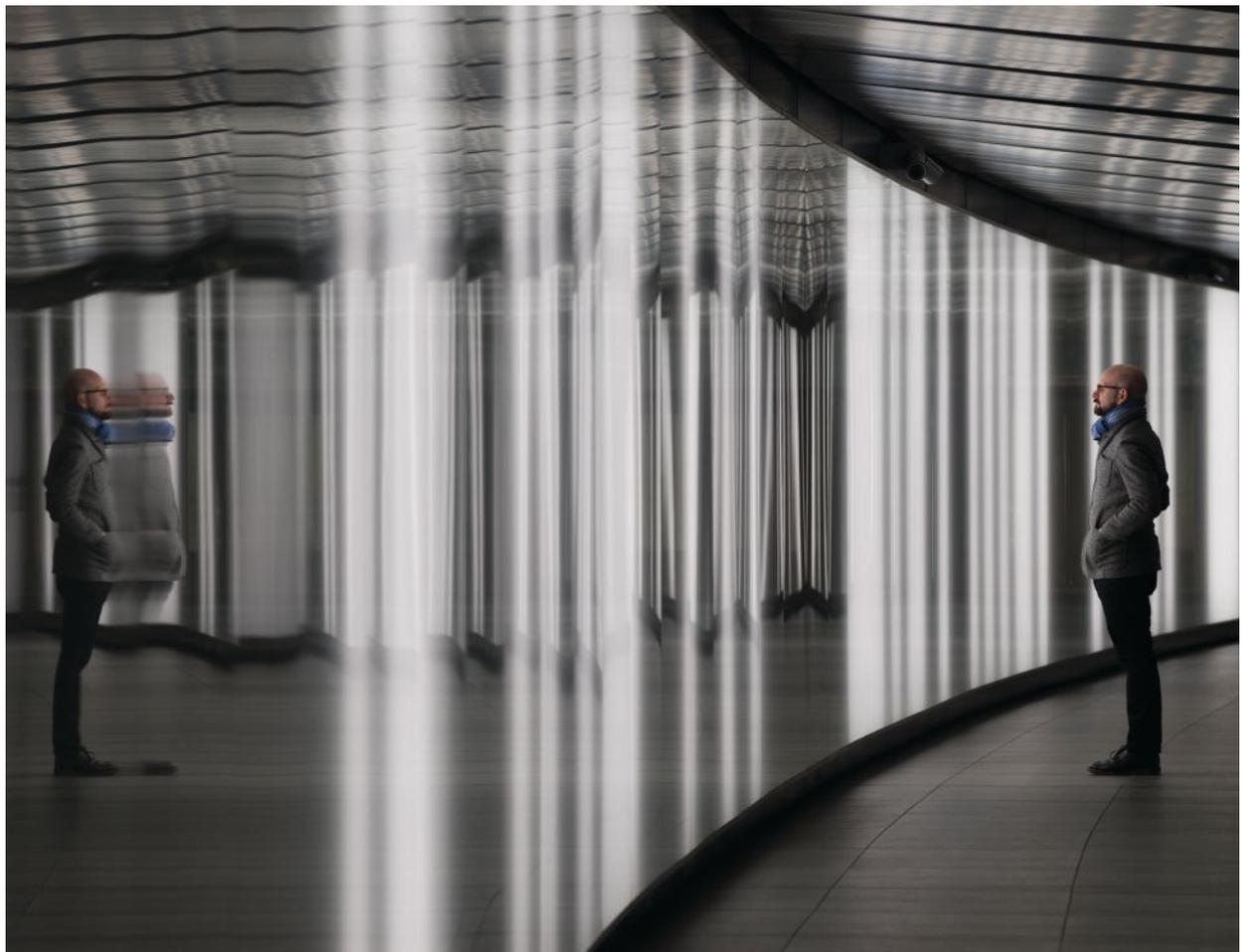
## FOUR LUMINAIRES WIN THE 2015 IF GOLD AWARDS

text by Hallie Busta

The German International Forum Design's annual IF Design Awards spotlight the latest in product design. This year, 66 lighting products were named winners. Four of those earned the competition's top honor, the Gold Award: Oviso by Ribag, in Switzerland; Lightscan by Erco (left); Luminária Ani by Pascali Semerdjian Arquitetos, in Brazil (right); and the Swivel PAR38 Lamp by Samsung Electronics. The lighting entries were judged by designers Danny Venlet of Venlet Interior Architecture, in Brussels, and Isabel Hamm of Isabel Hamm Gestaltung, in Cologne, Germany; and lighting designer Ulrike Brandt of Ulrike Brandt Licht, in Hamburg. •

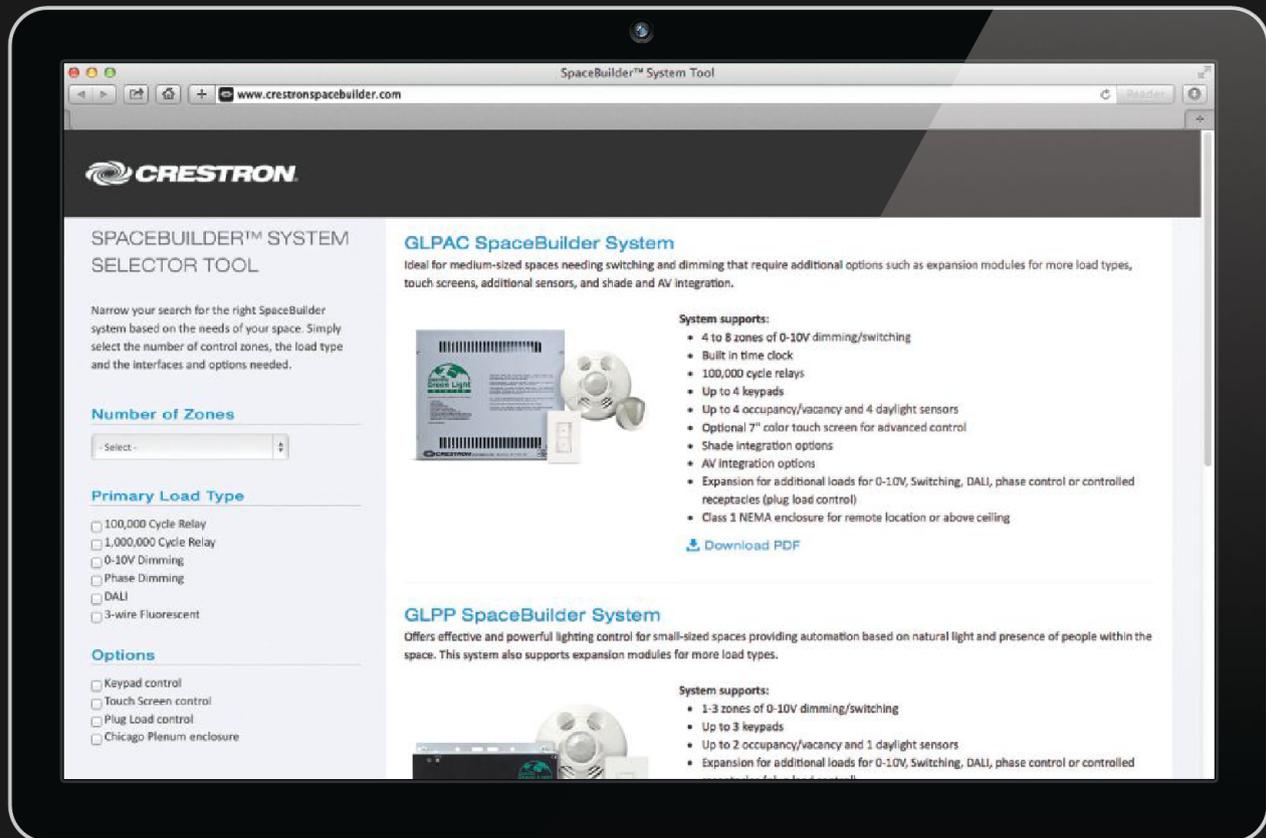


Commuters dashing through the pedestrian tunnel connecting London's Kings Cross Station and Pancras Square now have cause to pause—or at least slow down—thanks to a new installation by lighting designers Speirs + Major. On view since March 6, "Halflife" is part light source and part art scape, inspired by British physicist Ernest Rutherford's duly named principle of decay. Taking the form of a gently curved light wall, the dynamic installation is characterized by a white-and-RGB gradient that is meant to reflect the space's transient nature. The installation measures approximately 321 feet long by 7.9 feet tall, and it will display 92,160 hues across a full color spectrum during its life. Speirs + Major expects the installation to be illuminated for a maximum of 20 weeks. Read the full story online at: [bit.ly/AL\\_SM\\_Halfife](http://bit.ly/AL_SM_Halfife). •



Left: James Newton

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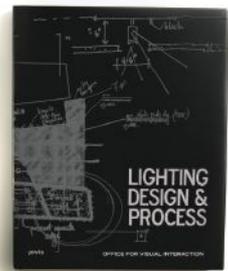
Launched in 2014, our Video One-on-One series features the industry's leading lighting designers sharing their thoughts and experiences about working in lighting design. To watch the episodes you see here, as well as the others in the series, go to [archlighting.com/videos](http://archlighting.com/videos). And while you're at our site, sign up for our email newsletter, AL Notes, where we announce new episodes. •



Some of the lighting designers that have been interviewed as part of the Video One-on-One series include (clockwise from top): Barbara Horton, Brian Stacy, Paul Gregory, Suzan Tillotson, Sean O'Connor, Richard Renfro, and Francesca Bettridge.

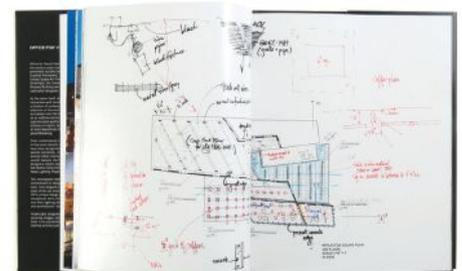
## BEHIND THE SCENES OF OVI'S WORK

text by Elizabeth Donoff

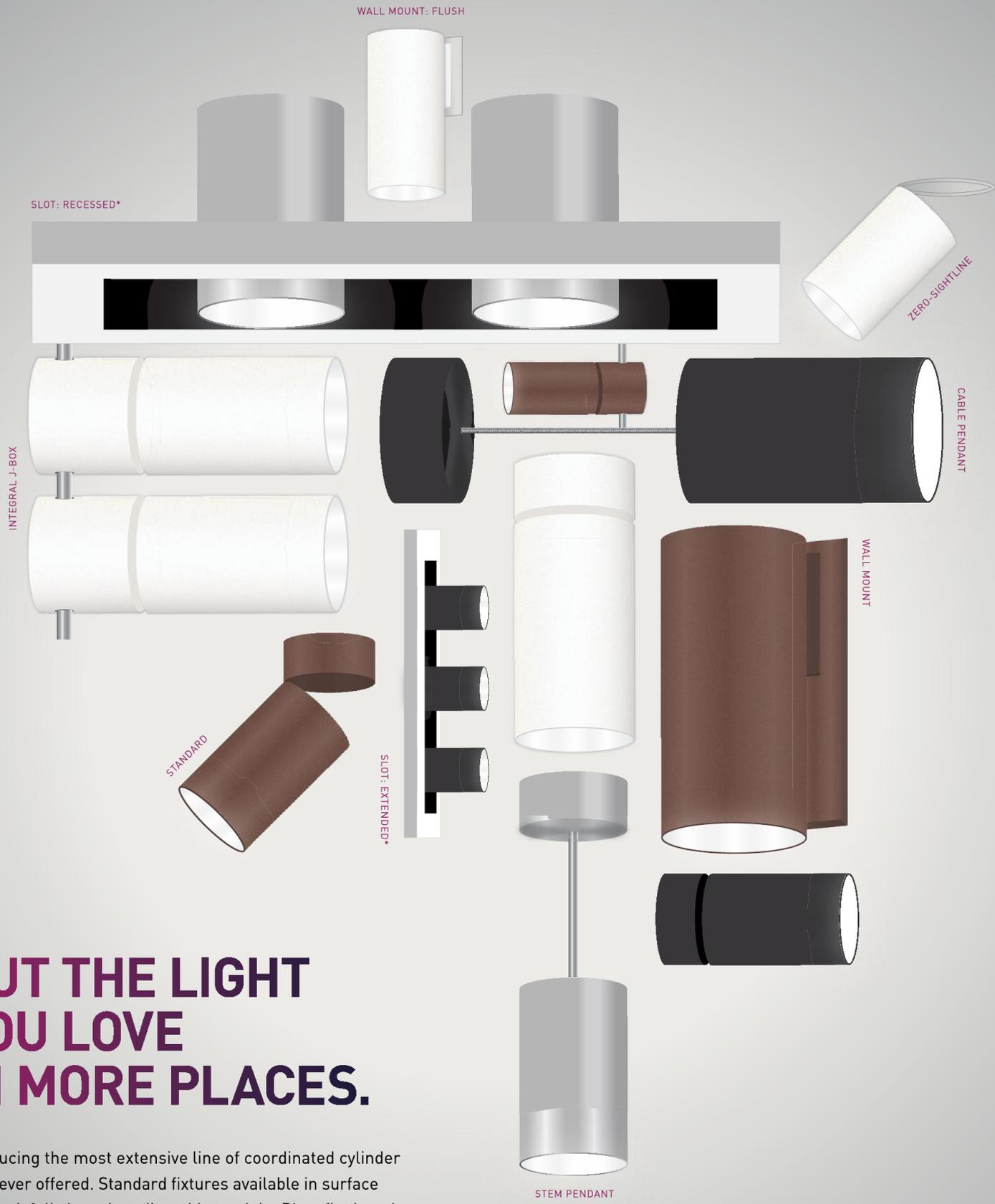


New York-based lighting design practice Office for Visual Interaction (OVI), founded by Jean Sundin and Enrique Peiniger, has released its first monograph, *Lighting Design & Process*. The 217-page volume presents the firm's work of the past decade and half and includes such notable work as the Scottish Parliament in Edinburgh, Scotland; the New York Times Headquarters in New York; the United States Airforce Memorial in Washington, D.C.; and the New York City streetlight redesign.

The book was designed by Sundin and Peiniger and incorporates sections that elaborate on their working process, showcasing the level of design and technical research that lies behind every project. The book also features an introductory essay by Dietrich Neumann, professor of History of Art and Architecture at Brown University. •



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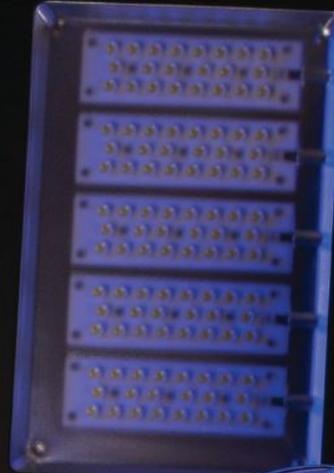
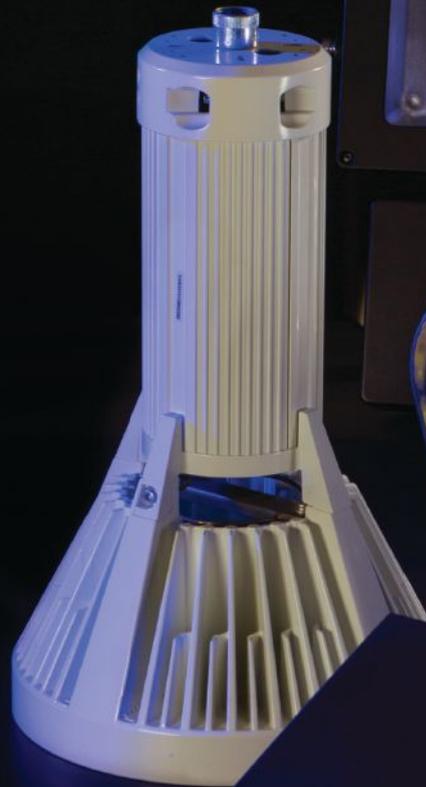
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# • DESIGN



REPORT

## DETROIT: MOVING FROM CALAMITY TO CLARITY

*The LED streetlighting program is a critical part of the city's rebirth.*

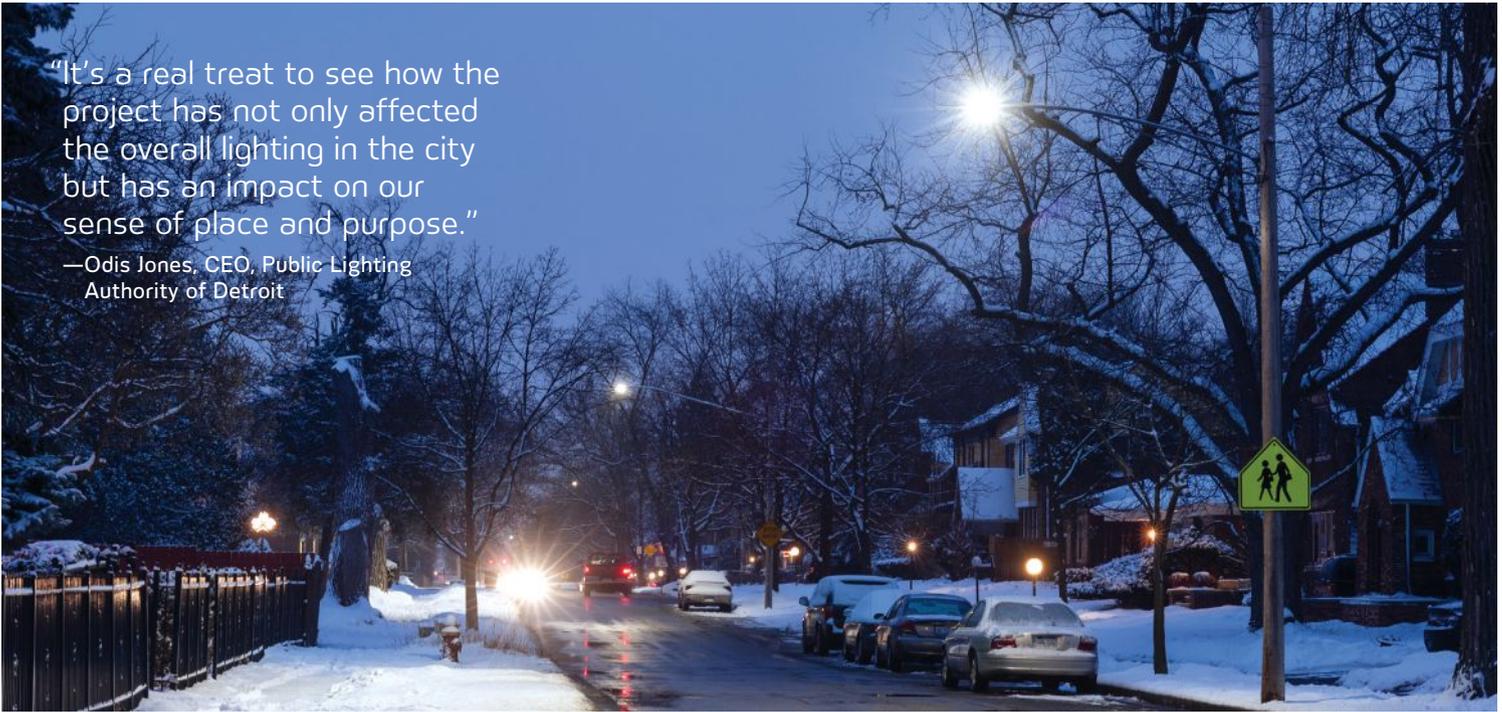
text by Bill Millard

photos courtesy Public Lighting Authority of Detroit

The Motor City is bouncing back from decades of being the national poster child for urban decay and disinvestment. As memorably depicted in the 2012 “ruin porn” documentary *Detropia*, the city has faced unusually harsh financial and infrastructural challenges in recent years, including multisystem breakdowns in city services and a black market in stolen materials, with scavengers treating both private and public structures as fair game. The copper wiring in

“It’s a real treat to see how the project has not only affected the overall lighting in the city but has an impact on our sense of place and purpose.”

—Odus Jones, CEO, Public Lighting Authority of Detroit



Whether the neighborhood is industrial (previous page) or residential (above), Detroit’s LED streetlighting program is allowing businesses and residents to reclaim their city and its nighttime environment.

streetlights became a target when copper prices spiked at \$3.70 per pound in mid-2007, up from \$0.60 per pound in 2002. (At press time, in early 2015, the price fluctuates around \$2.50 per pound.) Compounding the problem, says Odus Jones, CEO of the Public Lighting Authority (PLA) of Detroit, was an antique system of serial wiring in which the failure of one lamp meant that a succession of lamps would go out like a string of Christmas-tree lights. With scrappers pouncing on the copper coils found at the base of each pole, an estimated 40 to 60 percent of the city’s streetlights were out. The broken-windows theory linking civic disrepair with crime and fear, Jones observes, found strong confirmation in Detroit’s darkened blocks.

Jones, a native Detroiter, returned home from a position as Cincinnati’s economic development director to head the PLA, which was created in 2013 by Michigan Public Act 392 as an independent entity, distinct from the city’s Public Lighting Department. In his second day on the job—July 18—the City of Detroit filed for bankruptcy. Fortunately, in December 2013, a U.S. Bankruptcy Court held that the PLA is legally separate from the city with an independent revenue stream and resources untouched by the bankruptcy, so Jones was able to fend off creditors and quickly form a partnership with the state Treasury Department and Citibank that enabled the replacement of both aboveground and underground equipment,

returning light to long-darkened streets. This LED program is a critical catalyst in Detroit’s return to livable conditions.

In addition to exchanging high-pressure sodium (HPS) lamps for LEDs, the PLA is replacing the vulnerable copper wiring with less salable (yet more conductive) aluminum, which Jones calls “a strategic decision to disincentivize thievery.” Fixtures are also being wired with multiple circuits to eliminate the possibility of a daisy-chain failure effect. About \$90 million of the total \$185 million project, Jones says, is being spent on underground work. He also credits state legislators with cleaning up the scrap trade through tighter identification laws and checks mailed to sellers’ addresses, replacing point-of-sale cash payments. “If you show up at a junkyard with property that says it belongs to the PLA,” he says, “we’re going to take your picture, so you might as well smile.”

Detroit is diverse, made up of more than 300 neighborhoods, including historic districts where ornamental pole and luminaire designs are the norm. The PLA spends about \$1,000 per basic pole for an LED conversion, Jones says. In neighborhoods that prefer alternative designs, neighborhood associations have to pick up the difference for the distinctively styled poles. (The Sherwood Forest historic district, for example, is using crowdfunding to raise the money.) And this LED conversion project is boosting the regional economy, as 80 percent of

its contractors are located in the city. One local entrepreneur, Carla Walker-Miller, the provider of approximately 20,000 of the luminaires, won her contract in a national bid.

The PLA is also partnering with a technical school, the Detroit Area Pre-College Engineering Program (DAPCEP), to provide students with an opportunity to learn about the engineering theory associated with LED lighting, which could also lead to job opportunities. “With unemployment being so high at the time in the city of Detroit,” Jones says, “we wanted to make sure, if we’re going to do a quarter-billion-dollar project, that we’re building capacity here at home. ... Our local union IBEW [International Brotherhood of Electrical Workers] has exerted an effort to hire these young people once they graduate. It’s a real treat to see how the project has not only affected the overall lighting in the city but has an impact on our sense of place and purpose.”

Construction has started on three of Detroit’s major thoroughfares (Grand River, Woodward, and Gratiot Avenues), and where new lights have been installed, Jones has heard drivers claim they “can read a newspaper on these streets.” Feedback from businesses, social media commentators, and police officers has also hailed the light quality, which is roughly twice as bright as the old 75W HPS lamps. Where new poles are going in, the LEDs also allow wider spacing while still meeting a

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And thanks to falling prices and shrewd negotiation, these upgrades are coming at a bargain. "Given the nature of the project, we have been able in our bidding process to drive down the cost of LEDs," Jones says. "We're buying LEDs for \$100. Initially, when we went out to bid, it was \$600 or so. Now, for the 150W equivalent, we're paying \$134. For a 250W equivalent LED, the initial price was about \$700. Through our bidding process, we're now paying approximately \$250 per LED [streetlight]. So when you have competition and you unleash the entrepreneurial spirit and ingenuity of America—but more specifically here in this particular marketplace—the citizens win." •



### Scale of Program

65,000 total streetlights being installed, relighting all Detroit neighborhoods by the end of 2015 and major thoroughfares by the end of 2016.

### Progress

Approximately 42,000 new luminaires as of April 2015, ahead of schedule. • Overhead residential schedule is complete one year early. • Replacements on collector streets and major thoroughfares are approximately 40 percent complete, projected to be 100 percent complete on collectors by the end of 2015 and 100 percent complete on thoroughfares by the end of 2016.

### Finances

\$185 million in bonds sold by the Public Lighting Authority of Detroit (which was funded with a \$12.5 million annual earmark from the city's utility tax). • A favorable interest rate of 4.53 percent allowed the PLA to exceed its original bond-sales goal of \$160 million.

### Energy Savings

\$20 million annual energy costs projected to drop to \$3.4 million when conversion is complete.

### Equipment

150W equivalent LED lamps by Walker-Miller Energy Services (in partnership with Eaton's Cooper Lighting), Cree (XSP Series Area Luminaires), and Leotek for neighborhoods. • 250W equivalent LED lamps for collector streets. • 400W equivalent LED lamps for eight major thoroughfares. • 85 percent of streetlights are being wired overhead, 15 percent underground.

### Major Players

Public Lighting Authority of Detroit • Motor City Electric • Corby Energy Services • State Line Construction • Walker-Miller Energy Services • Detroit Area Pre-College Engineering Program • International Brotherhood of Electrical Workers (Local 58) • Department of the Treasury, State of Michigan • Citibank

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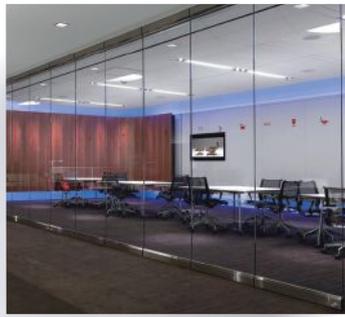
## THE OUTSIDERS

*Duncan Jackson and Eoin Billings bring a fresh perspective—and process—to lighting design and delivery.*

text by Elizabeth Evitts Dickinson  
portrait by Seth Lowe

A funny thing happened when Billings Jackson Design (BJD) set out to create new check-in desks for Terminal 2 in Heathrow Airport. They got rid of the desks.

Eoin Billings and Duncan Jackson, founding partners of the eponymous London-based industrial design firm, were asked to create a single desk that would please more than 23 airline operators as well as thousands of passengers. Most people wanted something



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# Cooper Lighting

by **EATON**

similar to what already existed, but that design didn't exactly work. The designers conducted ergonomic and observational studies and found the setup failed to serve passengers and check-in staff. "We didn't draw anything, we didn't give the clients renderings to prove our point, we showed them physically," says Billings, director of BJD. "We made a check-in desk out of cardboard and asked them to use it. It demonstrated how badly the existing desks worked."

The firm's solution got rid of the traditional desk in favor of a modular kit of parts that allows each airline to tailor its check-in area according to company and customer needs. Completed last year, the system has since earned high marks from airlines and passengers alike. "We transformed the space together, with them," Billings says. This, he says, demonstrates how BJD works. "We go at the solution from the point of view of the customer."

This human-centered approach is one of the reasons BJD has flourished into a powerhouse industrial design firm, one that has developed a strong portfolio of lighting products over its 23-year history. With additional offices now in New York and Chicago, the firm has a reputation for cutting-edge products that come in on time and on budget and have a seemingly prescient understanding of the marketplace.

Fifteen years ago, for example, BJD created Tecton for global lighting manufacturer Zumtobel, which is recognized for its lighting solutions for indoor and outdoor lighting applications. Tecton is a continuous-row lighting system that has remained a top-selling product line, in part because it has easily transformed from fluorescent to LED, and in part because it creatively resolved lighting challenges for a specific set of end user: retailers. "We asked: what do retailers want from their lighting?" says Jackson, head of the firm's Chicago office location. The answer was a high-tech luminaire capable of handling things like data transfer for point of sale, but was also simple to install and maintain.

**Neither of BJD's founders** has a background in lighting or studied lighting design. Rather, Billings studied industrial design and Jackson studied engineering and furniture design. This is, perhaps, their greatest strength: They bring an outsider's perspective to the process.

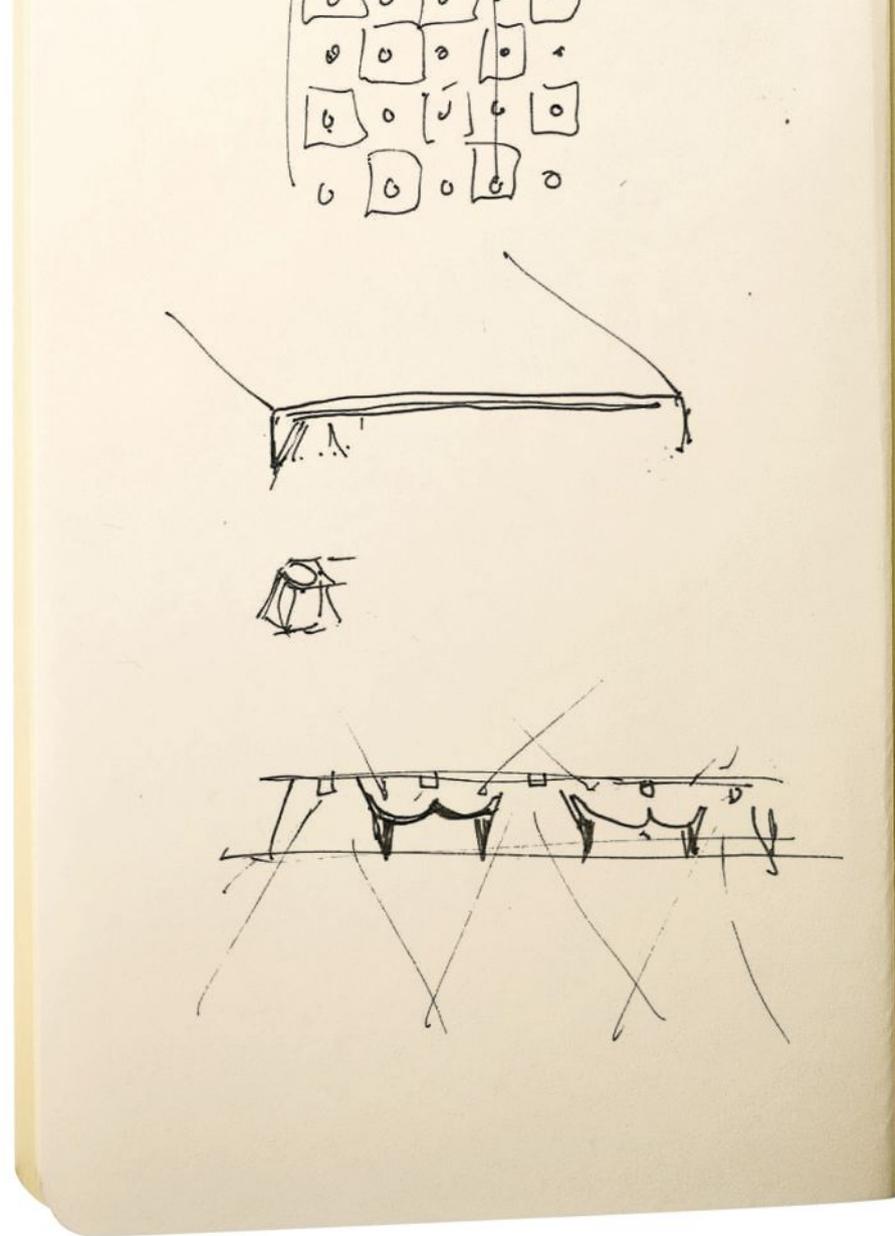
They also bring a comprehensive understanding of how buildings work. The first luminaire they designed was for the Royal Automobile Club in Bristol in 1994, a project led by Grimshaw Architects. Lighting was integral to the architect's strategy for the building from the very start. "They wanted a suspended system and were using a concrete soffit as the reflector," Jackson says. "There

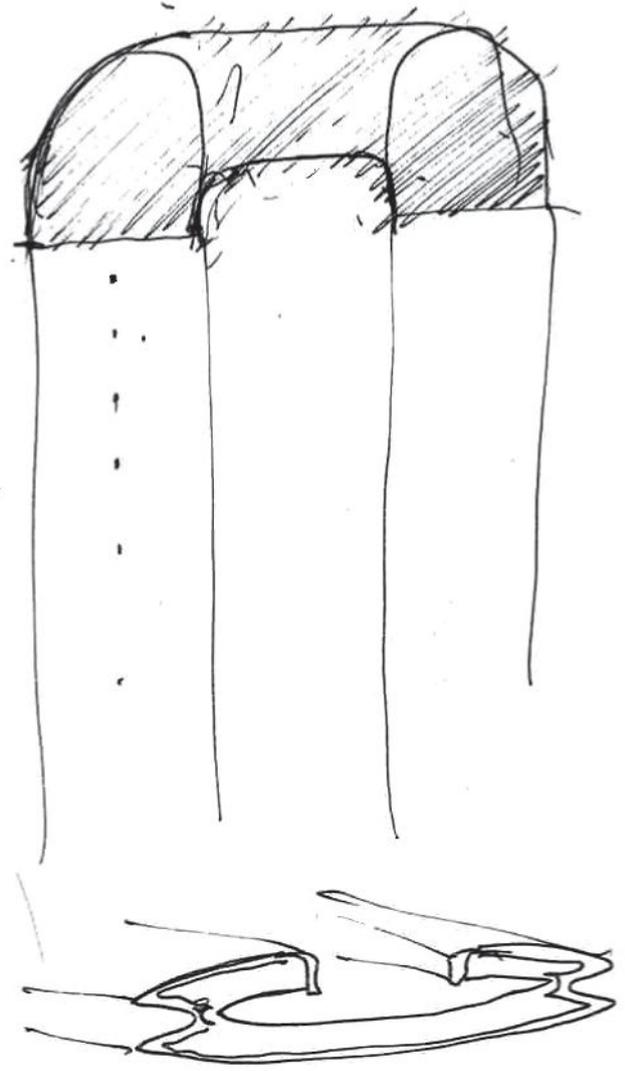
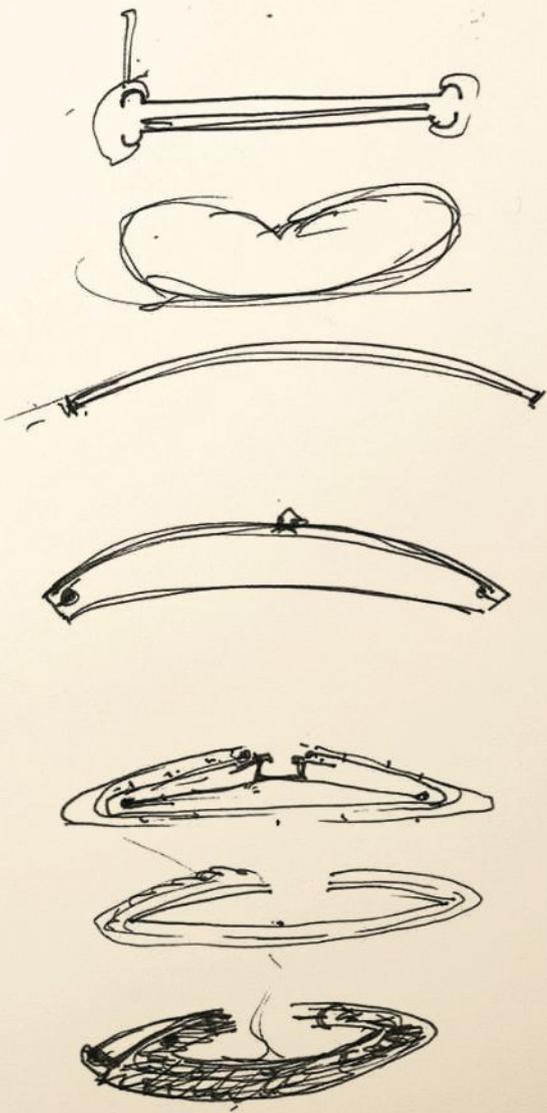
wasn't anything that we could use at the time that would fit [with] the architecture, so we designed it. That was our first foray into understanding how lighting products integrate into buildings."

Next, Billings and Jackson developed a set of exhibition cases with concealed, interior illumination for Grimshaw that could be used as a traveling display for the architecture firm's work. BJD reached out to Zumtobel to help in the development. "We met with a very talented lighting designer from Zumtobel and it was his responsibility to help support the lighting design that we developed for this exhibition," Jackson says. "We designed and built the exhibition with

his help in about eight weeks, and after that, Zumtobel came to us with a brief for Tecton."

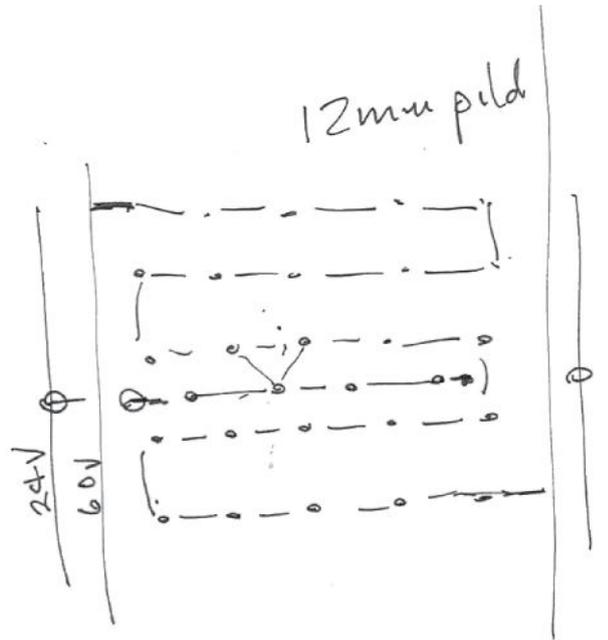
**BJD began the Tecton** design process by running a strategic workshop with representatives from various departments at Zumtobel: technicians, salespeople, and marketing staff. "We want to understand every aspect of the marketplace we're working in," Jackson says. This goes for all of the fields in which they design, including architectural interiors and lighting, transit and urban planning, wayfinding, and healthcare. "We regularly ask clients: 'Before we design, what do we need to know? What is your business model





Opening page: Duncan Jackson (left) and Eoin Billings (right) at work in the firm's Chicago office.

This spread: Concept sketches illustrate early iterations of the form and end-cap treatment for the Liteweave luminaire.



and how do you make your income? What are the paths to getting your product out?' And clients say that they've never had a designer ask these questions before."

When Billings says that they "go at their solution" from the point of view of the customer, this seems like an obvious approach—design for the end user. But when one parses exactly what he means, their unique process reveals itself. The "customer" may vary at any given moment. If one designs a consumer product, and it is only designed to be beautiful and functional, then a singular decision has satisfied only one design criteria in the overall chain of decision-makers. The fixture may be well designed, but if it's cost prohibitive to ship, or if the contractors in the field don't know to spec it, then it doesn't matter how successful the design is. "You have to understand the building industry in absolute detail," Jackson says. "In the lighting industry, it's almost like the product has to be sent out into the world with a whole lot of DNA to help it get specified. When we start, we always ask: What are the obstacles to specification?"

Their process involves asking a lot of questions and trying not to make assumptions. "I've always had a tendency to be the person who sticks his hand up in the class and asks the question," Jackson says. "Everyone hates it when they don't understand. I don't have a fear of appearing to look stupid, because you always learn. When we work with clients, we tell them that they are the experts, and we are expert at recombining knowledge."

It comes down to understanding not just fixture design—materials, aesthetic, and technology—but also manufacturing, distribution, contracting, and building maintenance. Everyone, then, becomes BJD's "customer."

With Tecton, BJD developed a high-volume, adaptable luminaire suitable for a variety of interiors, particularly retail. Although the fixture's initial price point was slightly higher than average, it disassembled for easy shipping and took 45 percent less time to install than comparable lighting systems. The full life cycle of the light, in other words, provided a cost savings. "We added economy to the overall system," Jackson says.

To assist Zumtobel in communicating the overall cost savings with the selection and specification of Tecton, BJD produced a video showing comparative times for installation. "It was complex communication, but the proof is in the pudding. That product is still highly successful 15 years later."

**BJD delivers not just** product design, but also a creative consideration of how products are manufactured, distributed, installed, and



A rendering (top), concept model (center), and final version (above) of the Liteweave luminaire that Billings Jackson Design created for Hubbell Lighting.

maintained. Martin Werr, director of new product innovation at Columbia/P2 Lighting, a division of Hubbell Lighting, says this is what makes BJD unique in the industrial design field. "We've had bad experiences with industrial design firms in the past," Werr says. "You find some firms with a great aesthetic sense, but they come back with designs that can't actually exist in the real world. What's great about [BJD] is that they understand the drivers of the marketplace—how specifiers think, how engineers work. They know what motivates buyers, they understand architecture; they understand electrical and mechanical requirements of a light fixture. They get that."

Billings and Jackson have a name for what Werr describes: applied industrial design. Their company literature defines it as "strategic decision-making through production to delivery." The two of them coined the phrase after they first met in London back in 1990. They were both working at Grimshaw on a furniture design project for Herman Miller. The pair saw a gap in the marketplace of business-to-business industrial design. "People would go into a catalog to spec pieces for a building, but not much attention was being paid to it at the time because the components of what went into a building were considered unglamorous," Jackson says. "We felt there was an opportunity to do better, to create products that were better, not just in how they looked, but how they functioned and were installed. We focused on the whole life cycle and cost of a product."

Once the duo discovered this shared passion for upending process and for addressing the complexity of industrial design for the built environment, they left Grimshaw to open their own firm in London in 1992.

Today, speaking with the two of them is a bit like being a guest at a boisterous dinner party. They are lively and full of anecdotes, yet quick to question one another on a specific detail. "People from the outside think we're having an insane argument, but we're quite frank with one another. We've always been that way," Jackson says.

**They have also** always been quick to grasp the potential of technology. For example, they recognized how solid-state lighting (SSL) presented an opportunity to control light as never before.

The latest example of this is Liteweave, a luminaire that they have just completed for Hubbell Lighting. Officially released to market in January, Liteweave uses low-power, low-brightness, flexible LED light sheets wrapped in such a way that the luminaire creates a seamless light source with no visible frame. Covered in an optical plastic lens material, the individual LED pixels blur and overlap creating a surface that

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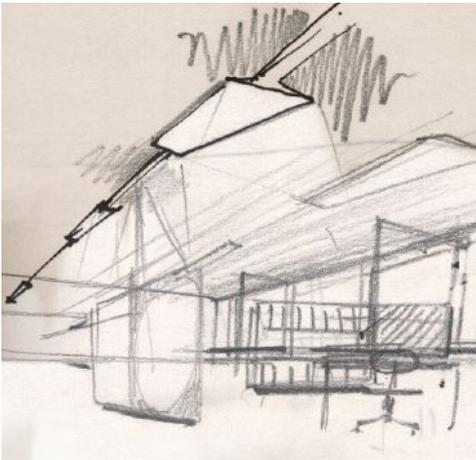
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Zumtobel's Tecton fixture was designed specifically with retail applications in mind. And below is an early concept sketch for the luminaire by Billings Jackson Design.



has the look of wicker, or fabric, inspiring the Liteweave name. "Not only is [Liteweave] visually fascinating, it's comfortable to look at, and it creates a 3D effect from a flat surface," says Werr. "It changes appearance as you move past it, and it has a depth to it that is quite amazing."

Werr met Billings and Jackson several years ago at Light + Building in Frankfurt and was impressed with their work, so he kept an eye out for a project where he might bring them in. Then he saw the flexible LED sheets. "The lighting industry in the U.S. is terrified about pixelization, but with this technology, the LEDs were much smaller than normal, and it takes the brightness of a single point of light and spreads it across a larger surface area," Werr says. "I immediately called Billings Jackson."

Werr says that it's unusual for lighting conglomerates in the U.S. to bring in outside designers like this. "My brand has hired outside industrial design firms on two or three occasions over the past 20 years, those firms were generalists and did not specialize in lighting, and they always disappointed," he says. "By hiring BJD, I'm regarded as a bit of a

renegade hereabouts."

Werr challenged the designers to create a suspended fixture for an environment such as a school. The luminaire needed to predominantly provide downlight, with only a small percentage of illumination directed onto the ceiling. "About two weeks later, they came back with a concept that frankly knocked my socks off," Werr says. "They did something I had never seen: They used the curvature of the sheet in a compelling way by folding it and wrapping it around the fixture."

Liteweave does just what Werr requested: It provides 70 percent direct and 30 percent indirect light in two lumen packages with low input wattage and high efficacy. "We have engaged them now on another project," Werr says. "On top of all of their understanding of the various aspects of design and marketability, they also have very strong project management skills. What really impresses me is they always keep their eye on affordability."

And that, says Jackson, is part of the firm's founding philosophy. They have a saying around the office: "It's rude to spend someone else's money without knowing what you're doing." •



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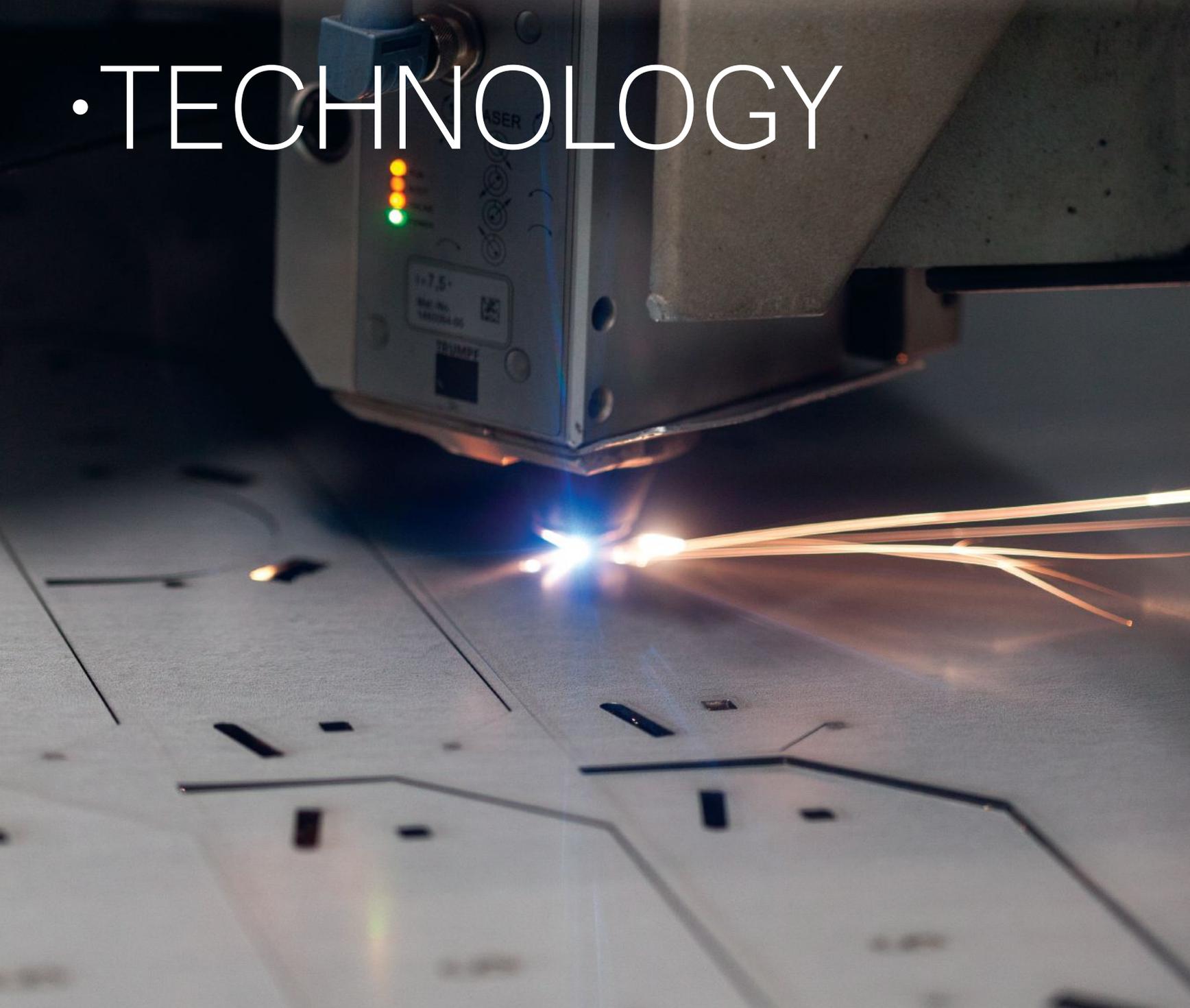


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# • TECHNOLOGY



TECHNOLOGY

## **LIGHT MANUFACTURING: THEN AND NOW**

*As consumers demand more solid-state luminaires, companies must update their factories and workflow.*

text by Gideon Fink Shapiro  
photos by Fran Parente

New technologies have transformed both the marketplace for lighting products and the factories behind them. Manufacturers, large and small, have retooled their operations, hired new staff, and changed their workflow in response to changing demands, both real and anticipated. Two major shifts in particular have rocked the lighting industry over the past decade. The first is the rise of solid-state lighting (SSL), which relies more heavily on electronics than do legacy sources. The second is the advent

of digital manufacturing techniques. It's no coincidence that the age of the LED is also the age of CNC milling and 3D printing. "The process couldn't be any more different," says Joe Cenin, supply chain general manager of GE Lighting. "There's been a significant shift in technology, mindset, and skills."

#### RETOOLING FOR AN LED WORLD

Lighting companies have been formed to operate specifically within this new technological and market context. For example, Montreal-based Lumenpulse was founded in 2006 as a "pure-play LED company, with no baggage to manage the transition from traditional sources," says Greg Campbell, the company's senior vice president and chief technology officer. What differentiates LED manufacturing, he says, is a dependence on electronics, including circuit boards, microcontrollers, and software; these components add new complexities to the supply chain and the assembly process.

Longstanding legacy companies have been faced with a choice: Modernize or become obsolete. Edison Price Lighting, a family-owned design and manufacturing firm founded in 1952 by lighting pioneer and inventor Edison Price, chose to revamp its production techniques. In the mid-2000s, the company, based in Long Island City, N.Y., began to retrofit its "work cells," or product areas on the factory floor, says George Closs, executive vice president for engineering and operations at Edison Price. These updates have allowed the company to develop new LED luminaires while also making LED versions of their existing incandescent, fluorescent, and halogen fixtures, many of which have become industry standards.

The gamble on LED technology was made even more risky because of its timing—the Great Recession of 2007 to 2009 had just begun cutting into overall business. "I made a decision that we would go for it on the LED front and revamp our whole factory," says company owner Emma Price. "Getting through a recession is hard enough, and switching over your company is hard enough. Doing them at the same time is really stressful."

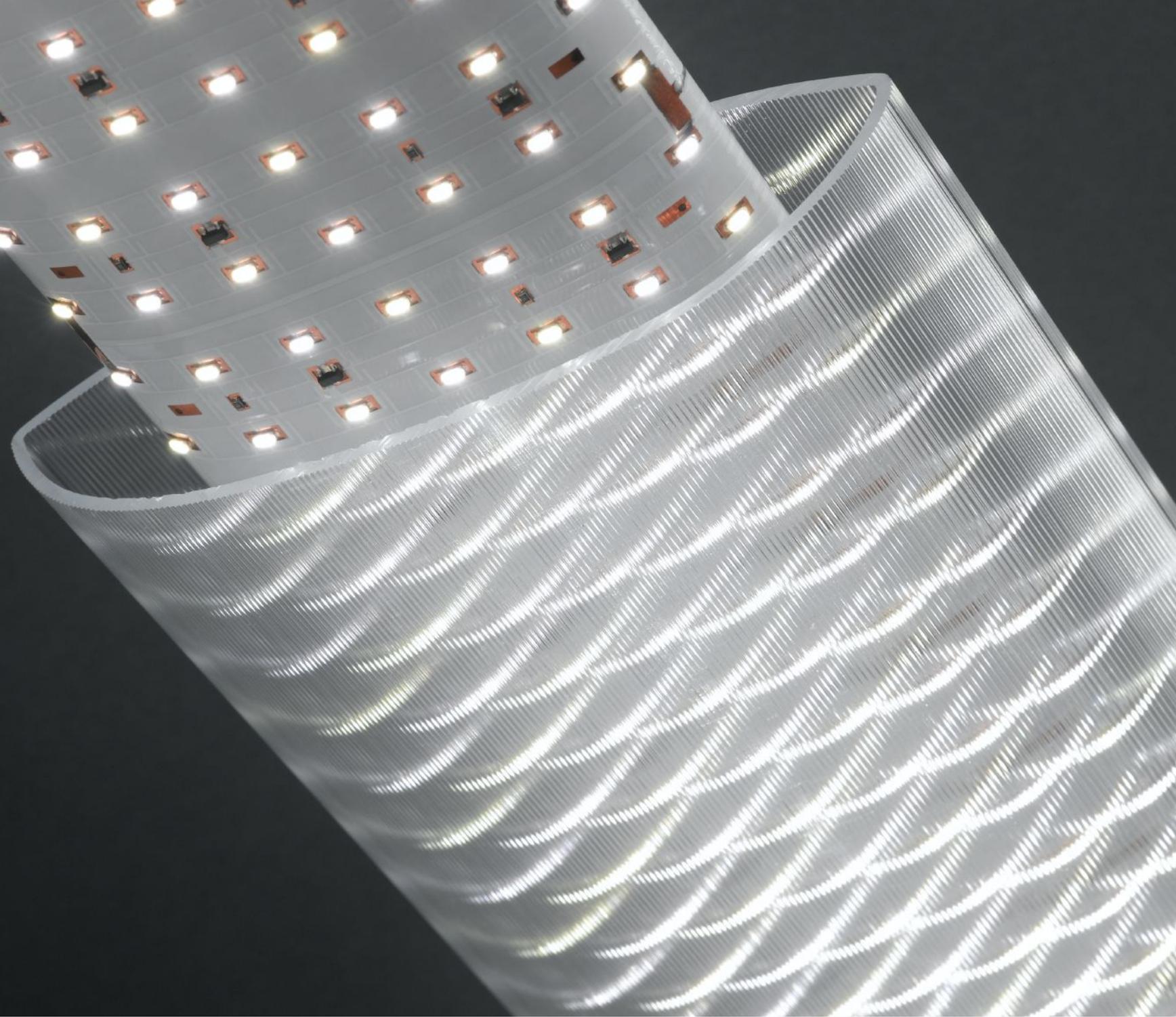
But the investment proved to be a smart move. By 2013, as LED orders were eclipsing sales of other luminaire types, Edison Price had dedicated 75 percent of their total production area to LED fixtures. "We made a clean slate and started totally from scratch on the shop floor," Closs says.

#### CHANGES ON THE FACTORY FLOOR

In the past, lighting manufacturers used hard tool and die sets, with punch and brake presses specifically designed for each given product. But in 2009, Edison Price bought its first fully



George Closs, executive vice president for engineering and operations at Edison Price Lighting (top), has helped oversee the company's manufacturing evolution by adding digitally controlled tools, such as Trumpf's TruLaser 1030 laser fabrication center, which cuts metal (previous page). The company also has a five-axis CNC press brake to bend sheet metal into parts for recessed LED luminaires, track fixtures, and track systems (above).



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In the final assembly area at Edison Price's factory in Long Island City, N.Y., workers pair components that are made to order onsite with electronics that are sourced externally.

automatic CNC punching center, an enormous machine that can punch patterns into sheet metal all day and night, unattended. To this, the company added other digitally controlled tools: a vertical machining center, a turning center, a press brake, and a laser fabrication center. In a typical workday, technicians circulate among the different machines, monitoring or adjusting them as needed.

The CNC tools aren't inexpensive, but they afford a flexibility that was previously inconceivable. Edison Price, which assembles luminaires to order—no inventory sits on shelves—can now update a product line without building a new set of hard tooling. Instead, they simply update a virtual model in Solidworks 3D CAD, which sends the new instructions directly to the CNC fabrication machines. But that doesn't mean carte blanche for the company's design and engineering team, which is made up of 11 of the company's total staff of 85.

"We don't just think up a product and build it," says Richard Shaver, executive vice president of research and development at

Edison Price. The design engineers still work with colleagues in sales, manufacturing, and sourcing to develop products grounded in the realities of both the market and the factory floor. "A lot of it is understanding what the factory can do and can't do," Shaver says.

Kelley Brooks, advanced manufacturing leader at GE Lighting, describes a reversal between the custom and generic aspects of production. Lighting manufacturers formerly used "completely custom-built equipment to make a relatively generic product," he says. "Now, the equipment is much more generic—press brakes, presses, paint systems, plastic injection molding—but it enables us to make various iterations or customize a product." A modern lighting factory must be able to meet the demands of today—and tomorrow.

CNC equipment may not always be the right choice for a high-volume product, Brooks says. He cites the case of an indoor pendant in which the first iteration was manufactured in CNC turret presses and press brakes. For the fixture's second generation, GE simplified its

geometry while improving its performance. Anticipating higher sales volume, they moved to hard-press tooling. "The projected volumes are important to us in deciding how to make a given part," Brooks says.

Similarly, Edison Price has maintained its traditional punch presses for making legacy parts that do not need to change, such as junction boxes and mounting brackets.

Not all lighting manufacturers, however, have had to start from scratch to integrate new technology. Bartco Lighting, a family-owned designer and fabricator of linear fixtures based in Huntington Beach, Calif., has been using CNC tools since its founding in 1995. The company's sheet-forming and extrusion techniques haven't changed significantly in the past two decades, despite the increasing number of LED fixtures that they produce, says Dennis McKee, Bartco's vice president of special projects and corporate affairs.

Early-generation LEDs were so large and ungainly that the company developed proprietary LED boards and driver components

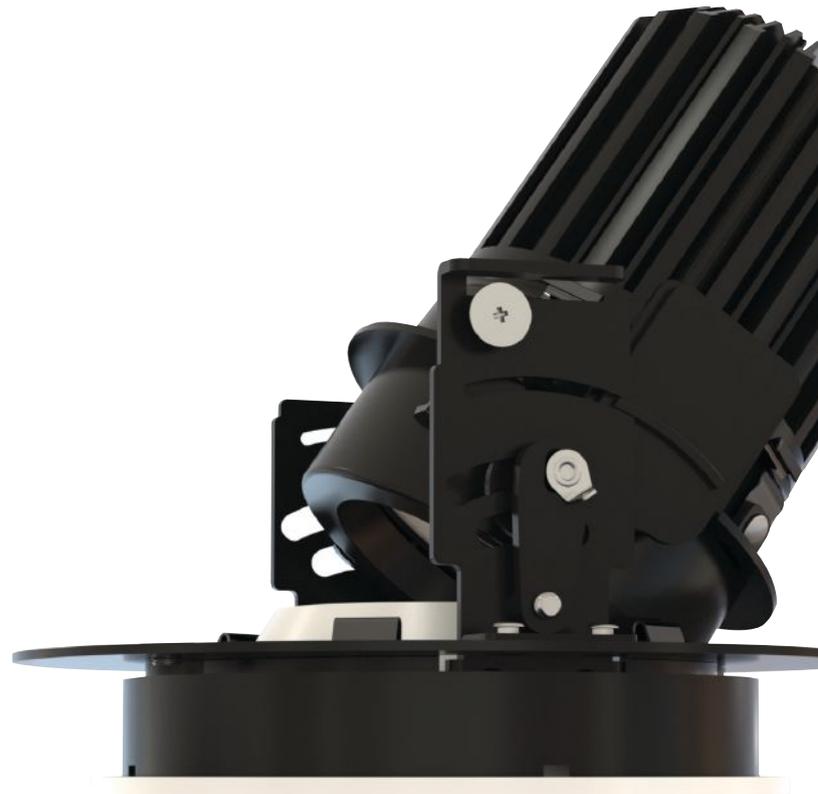


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## CAPABILITY

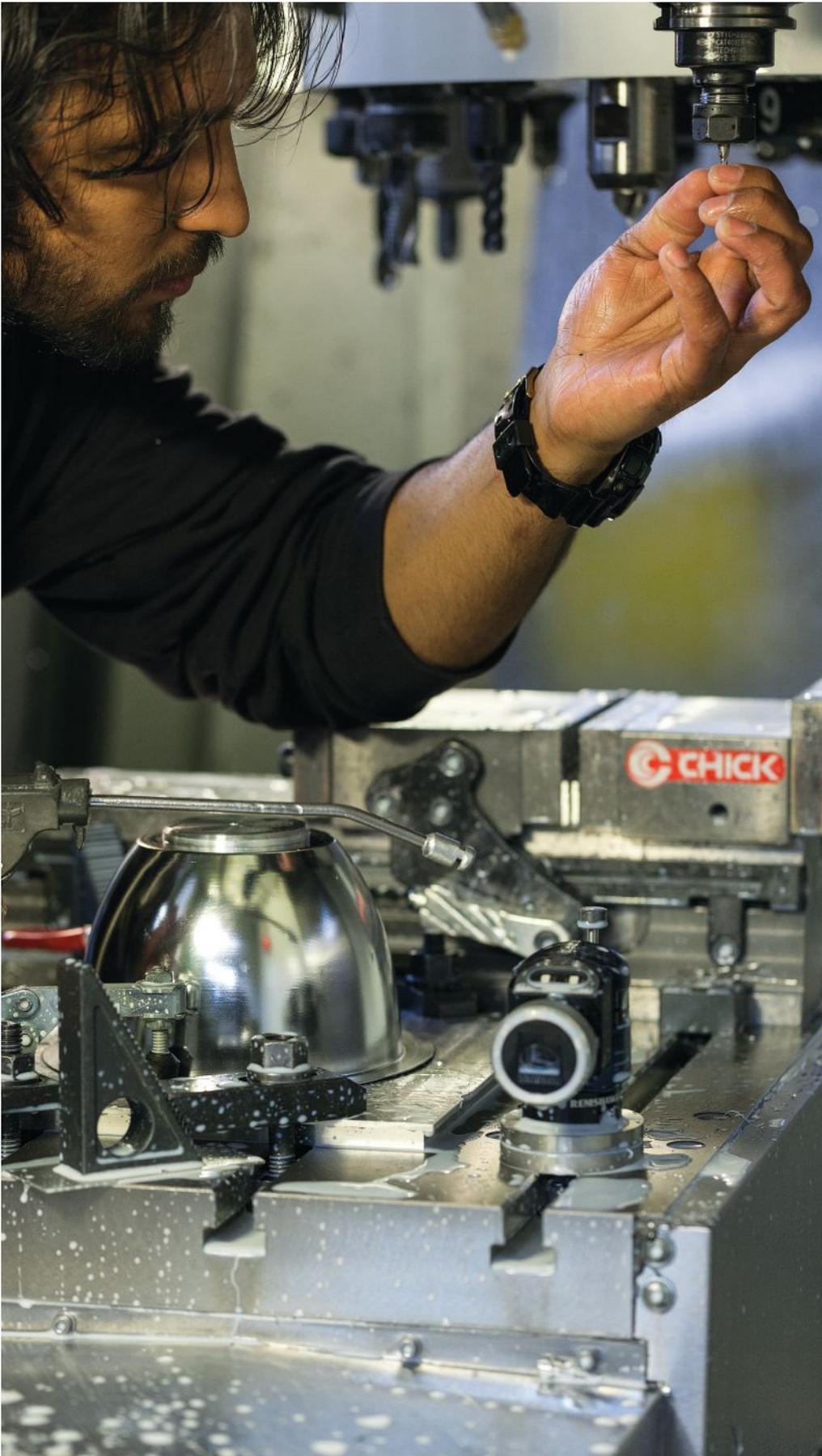
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A worker changes the tool on the spindle of Edison Price's Haas Automation VF-1 vertical machining center, which CNC-mills metal parts that are used in the final assembly of the company's track fixtures, as well as supports the production of the company's track systems and R&D efforts.



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**HUBBELL**  
Lighting

to work with their fixtures. But the newer, smaller LED components on the market today are similar to a fluorescent ballast in terms of profile and footprint, McKee says, and can fit more easily within the company's sleek fixture designs. "There is a little more interchangeability now," he says.

Although manufacturing is increasingly mediated by computers and robots, workers still have to be highly trained. "Every piece of that LED fixture today requires a little bit different knowledge: benders, brakes, tooling to punch it out, or sophisticated, automated painting equipment," GE Lighting's Cenin says. "Instead of a highly automated machine run by a mechanic, there are a lot of different skills involved."

#### ADVANCES IN ASSEMBLY

As the processes of forming and punching metal have become automated, assembly—the final step of manufacturing—has become more intricate. This largely results from the increasingly sophisticated electronics that make up LEDs. Unlike the days of manufacturing legacy light sources, in which vendor-supplied ballasts or sockets could be popped into a freshly formed piece of metal, workers at Hubbell Lighting's assembly facilities, for example, now populate circuit boards using a surface mount machine, and check the final color temperature and output with spectrometers and power meters—"things we never used to worry about," says Steve Arriola, director of operations for the Greenville, S.C.-based company. "As far as assembly methods, we were more of an electrical company before. Now we're more of an electronics company."

And manual labor still plays a bigger role than meets the eye. The dexterity required to assemble electronics, which can involve many small parts, should not be underestimated. "We found that we needed to hire skilled labor, where they had experience with electronics manufacturing," Arriola says.

As the assembly process for light fixtures becomes more like that for cellphones and televisions, the path to obsolescence is also shorter. "A product might get changed after five or six months," Arriola says. "The technology is just much quicker." Drivers that are more programmable and LEDs with higher efficiencies rapidly translate into more advanced luminaires.

Lumenpulse, in contrast to a company like Hubbell, doesn't manufacture its drivers' electronics—or even its own metal or plastic components. But Campbell says that his company is nevertheless modeled on the electronics industry in the sense that "we are a finished goods assembly house." Many of the electronics in a luminaire are not

unique to the lighting industry. "We're buying components that are also used in automobiles and medical equipment," he says. Foregoing vertical integration, the company sources its components from outside vendors and completes final assembly at its facilities.

Sourcing electronics externally can pose logistical challenges, Campbell says. Customers expect orders to ship within two to six weeks, but it may take up to 26 weeks to obtain a shipment of semiconductors from a vendor. Even the most efficient assembly facility will stand still if the components don't arrive in time.

So Lumenpulse has to forecast what components it will need months in advance. At the same time, the company wants to maintain a flexible, demand-driven approach to manufacturing. To reconcile these competing factors, Lumenpulse designs parts that can be used in different combinations, in different products, to meet customer demands. The more universal the parts, the more the company can streamline its sourcing and avoid either a shortage or a backlog of specialized parts.

Like a computer manufacturer—think Dell or Samsung—Lumenpulse offers a number of options that can be customized in a product: fixture configuration, color temperature, optics, controller specifications, and others. The luminaire is therefore conceived not as an inviolable whole, but as part of an ever-changing family of related products that share common components.

#### 3D PRINTING AND PROTOTYPING

The necessity to design universal parts runs counter to another increasingly common technology: 3D printing. Additive manufacturing techniques are yielding interesting luminaires and lighting systems, but in the world of high-volume manufacturing, they are mostly relegated to the limited, albeit important, role of prototyping. "A picture's worth a thousand words, but the real object is worth a thousand pictures," GE Lighting's Brooks says. "I can immediately start looking at how will this go together, what would it look like, and what would I do differently from a manufacturing standpoint."

Edison Price uses the technology in much the same way. Its research and development department makes experimental parts "almost every morning" using both 3D printing and CNC machines, Closs says.

**As for the next innovation** in lighting production, several manufacturers predict that the most significant changes will arrive in the form of more sophisticated ways for users to control output. This could include dimming, color changing, and integration with computers



Lumenpulse's final assembly operations in Montreal rely on a flexible supply chain and manufacturing facility to meet the ever-changing digital world. The high number of electronics in LED luminaires requires dexterity on the part of trained technicians.

and apps, Closs says. On May 14, as part of a neighborhood arts festival, Edison Price will be opening a gallery in its New York factory where they can show customers how different fixtures can create different effects, while displaying the work of local artists.

Meanwhile, Hubbell's Arriola looks forward to a simulation software that will allow customers to test their desired specifications and receive custom-tailored products from the factory.

While many of today's successful lighting manufacturers enjoy a long and rich history, none of them can afford to be nostalgic. "Nobody cares that much for the history," Emma Price says. "What people want to know is what you can do for them right now." Consequently, she says, what is worth preserving is "the integrity of the product." •

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text by Elizabeth Donoff

Nearly 400 products were submitted this year for consideration for ARCHITECTURAL LIGHTING's Annual Product Issue, a strong indicator that the economy and the lighting industry remain robust. On the pages that follow you'll see a maturity in product offerings, especially when it comes to solid-state lighting. To be sure, the industry is still grappling with LEDs as it addresses—and revisits—longstanding technical issues such as flicker, color, dimming, optics, and controls, while tackling new variables specific to LEDs, such as component compatibility. An extraordinary amount of research and development has occurred over the past five to seven years, and there is still more to do.

In selecting these products as part of our annual review, we seek to present diversity of both products and manufacturers. But we also wish to put these examples in a broader context. To that end, you will find our Technology Trends series of stories woven throughout the following pages, which is a set of articles about some of the current issues helping to shape product development and the lighting industry. We debuted this series in last year's product issue; this year, the four topics we've chosen to look at are LEDs' functional capabilities, outside influences, color tuning, and product obsolescence.

As is the case with all of our product coverage throughout the year, the following pages serve as a guide to the latest industry offerings. •



## TECHNOLOGY TRENDS

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# DECORATIVE

*Creative forms and versatile materials amplify residential, hospitality, and contract interiors.*



**Fedora, Axo Light** • The form of Axo Light's Fedora family of LED suspension luminaires (shown) and direct-mount spotlights is inspired by Matryoshka, the traditional set of Russian nesting dolls. Each fixture produces diffused, direct/indirect, white light via a single 7.5W LED. Composed of an upper housing of aluminum in metallic bronze or rose gold finishes and a faceted, transparent glass diffuser, the fixture is suitable for commercial and upscale residential spaces. • [axolightusa.com](http://axolightusa.com)



**Element, Corbett Lighting** • Inspired by diagrams of molecular structures, and possessing a form that the company likens to the childhood game of jacks, Element is handcrafted from iron finished in Vienna bronze. It can be suspended from aircraft cables or mounted as a wall sconce. Each smoked, plated, and frosted white-glass ball contains its own halogen light source. Dimensions vary by configuration, with a 33.75" square footprint offered for the model shown. • [corbettlighting.com](http://corbettlighting.com)



**Button, Estiluz** • Button is a flexible luminaire characterized by saucer-like aluminum pendants and fixture heads fitted with 8W LED lamps. They can be suspended individually from cords or grouped and mounted in a linear electrified guide. Tactile sensor switches turn each LED on and off to help manage light levels. The fixture is available in black, gray, brown, and milk white. • [estiluz.com](http://estiluz.com)



**Edge, Ilex Architectural Lighting** • Created by Miami-based designer Michael Wolk, this wall-mounted LED fixture is characterized by its geometric arrangement of rectangular brushed-aluminum slabs and a shiny opal acrylic diffuser. The 3500K fixture provides 350 lumens. Its sharp, clean lines suit it for use in contemporary-styled commercial applications. • [ilexlight.com](http://ilexlight.com)



**Alhambra Table Lamp, Boyd Lighting** • From New York City-based designer Fiyel Levent, this table lamp offers a modern take on central Asian and Islamic design motifs. Composed of a glowing polymer base with complementary patterns on opposite sides, a white-silk shade, and an etched glass diffuser, the fixture comes in four finish options and accepts either one A21, 150W maximum incandescent or a screw-in LED lamp. • [boydlighting.com](http://boydlighting.com)



**Alva Pendant, Tech Lighting** • This socket-and-cord pendant recalls the early days of electric lighting with its resemblance to an Edison-style squirrel-cage lamp. It is available in 3000K and 2200K, as well as a dimmable 3000K to 2200K option. A 14.5W LED module integrated within the lampholder offers downlight while an optic crystal diffuser features intricate filaments laser-etched onto its surface. • [techlighting.com](http://techlighting.com)

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**Oda, Avenue Road** • By German designer Sebastian Herkner, Avenue Road's Oda consists of a hand-blown, tinted glass barrel balanced on a four-post steel frame. The luminaire comes in three sizes—9" in diameter by 18" tall; 18" in diameter by 33" tall; and 18" in diameter by 55" tall—and can sit on the floor or a counter. • [avenue-road.com](http://avenue-road.com)



**Cyrus, Bruck Lighting/Ledra Brands** • Featuring hand-blown glass, Cyrus is a cylindrical pendant that measures 11 $\frac{7}{8}$ " tall and 4" in diameter. Its shade is offered in white, gold, or black, and its interior can be finished with gold or silver leaf for either a warm or a cool glow. The fixture can be lamped with a compact fluorescent that has either a GU24 or an Edison base, and it also can be mounted to any of the company's line-voltage tracks. • [brucklighting.com](http://brucklighting.com)



**Trepied, Ligne Roset** • Ligne Roset has made its 2012 Trepied floor lamp available in suspension and wall-mounted varieties. Available in white satin or black lacquer finishes, the fixture is offered with 33W 230V G9 halogen lamps housed in faceted, pressed aluminum reflectors. The wall-mounted version (shown) comes with two reflectors and can be mounted vertically or horizontally. The suspension version comes with five reflectors and 6.6' of cable. • [ligne-roset.com](http://ligne-roset.com)



**Newbury, Hudson Valley Lighting** • Brass strands integrated in the cone-shaped, hand-blown glass shade that defines this pendant are highlighted when the fixture is illuminated. A tungsten-filament lamp and a round-and-rectangular suspension chain mix classic and contemporary design styles. The luminaire is offered in two sizes with aged brass or polished nickel finishes, and it can be ordered with optional LED Edison-style lamps. • [hudsonvalleylighting.com](http://hudsonvalleylighting.com)



**Kore LED Ambient Orb, Tegan Lighting** • The Kore LED Ambient Orb is characterized by its globular aluminum-and-steel heat sink attached to a hand-blown glass sphere diffuser. It can be specified solo or with one of the company's shades. The fixture comes with a standard-output 15W module that produces 850 lumens and a high-output 38W LED module that produces 2,200 lumens. Both sources have a CRI of between 80 and 85. • [teganlighting.com](http://teganlighting.com)



**Brisbane LED Cord Hung Pendant, Barn Light Electric** • This LED pendant calls to mind vintage explosion-proof fixtures with its cast guard, glass body, and shallow bowl shade. Offered in 12", 14", and 16" shade widths and 20 finish colors, the luminaire is suitable for residential and commercial applications. Its 16.8W LED lamp is TRIAC-dimmable to 1% and comes in 2700K, 3500K, and 4000K with a minimum CRI of 80. • [barnlightelectric.com](http://barnlightelectric.com)



**Chroma Pendant, jGoodDesign** • The Chroma Pendant is composed of round, hand-blown glass forms of varying proportions with a band of color derived from the fabrication process circling the light source. Made by hand in New York City, the pendant is available with brushed aluminum or brass hardware. Multiple colors are available for the glass diffusers. The fixture can be lamped with incandescent, LED, or fluorescent sources. • [jgooddesign.com](http://jgooddesign.com)



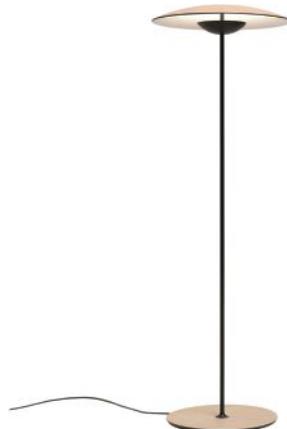
**Vantara, LBL Lighting** • This sleek wall sconce is composed of an elongated aluminum V-shaped body that holds twin light diffuser panels and doubles as their heat sink. Powered by one 28W LED module in 3000K with a CRI of 80, Vantara provides 2,000 lumens. It can be configured for direct or direct/indirect light distribution. Available in satin nickel or rubberized white finishes, the fixture measures 14" tall, 7.5" wide, and 2.6" deep. It can be mounted vertically or horizontally. • [lblighting.com](http://lblighting.com)



**Uno and Duo LED Pendants, Delray Lighting** • These circular LED suspension fixtures are available in direct (Uno) or direct/indirect (Duo) light distributions. Composed of slender extruded aluminum hoops—Uno measures 1" wide by 1" tall while Duo measures 1" wide by 2" tall—in 2', 4', and 5' diameters, the fixture is intended for low-ceiling spaces. Available in 3000K and 3500K with a CRI of 90. • [delraylighting.com](http://delraylighting.com)



**Architectura LED W3A0105, Aamsco** • This LED wall sconce takes the elegance of the box to its most pristine conclusion. A rectangular cuboid measuring 6" tall by 4 $\frac{1}{4}$ " wide and 1 $\frac{1}{4}$ " deep, the fixture comes in white powdercoat and textured silver finishes. Appropriate for indoor use in hospitality or commercial settings, the 120V surface-mounted fixture provides 3000K at a CRI of 85 and is lamped by two 3W LEDs that accent walls with direct/indirect light. • [aamsco.com](http://aamsco.com)



**Ginger, Marset** • This collection of interior fixtures from Barcelona-based designer Joan Gaspar is a tribute to Ginger Baker, drummer of 1960s rock band Cream, and is offered as a pendant, table, and floor luminaire (shown). Its 4mm-thick (0.16"-thick) shade resembles a cymbal and is made from compressed layers of wood and paper, complemented by a white reflector and wood finish. The 14.8W floor lamp model is available in 2700K and provides 1,780 lumens. It is 49.21" tall and 16.54" wide at its head and base. • [marset.com](http://marset.com)



**Illusion, Luceplan** • Created by Argentine-born designer Francisco Gomez Paz, Illusion gives the impression of a sphere captured within a square—an optical effect created by the fixture's Fresnel lens and thermoplastic diffuser. The 9"-square fixture is suited for use indoors and can be mounted to the wall or ceiling. Dimmable, it is powered by a 3000K 17W LED module. • [luceplan.com](http://luceplan.com)



**Hera, Derek Marshall Lighting** • Named after the Greek goddess of women and marriage and the wife of Zeus, the artisan Hera wall sconce features glass that is molded to highlight vertical grooves and a flared middle. It measures 15.5" tall by 7" wide and is 4" deep. The 200W luminaire requires two lamps and can use a variety of sources, including incandescent, halogen, compact fluorescent, or LED. • [derekmarshall.com](http://derekmarshall.com)



**Sky Fall, Studio Italia Design** • Studio Italia Design's Sky Fall pendants get their aesthetic from the use of Murano glass shades in crystal, chrome, gold, and rose gold colors. Available in two sizes—8.7" in diameter by 14.9" tall, and 14.9" in diameter by 20.5" tall—the fixture is lamped with two 10W LED modules in 2700K with a CRI of 95. • [studioitaliadesign.com](http://studioitaliadesign.com)



**Beyond, Hubbell Lighting/Progress Lighting** • The Beyond series from Progress Lighting comes in round (shown) and square profiles with options for textured glass, metallic overlays, and geometric acrylic diffusers. Mounted to the walls or ceiling, the 120V fixture measures 12" in diameter and 6" deep, and is offered with a replaceable 17W LED module in 3000K with a CRI of 90. • [progresslighting.com](http://progresslighting.com)



**Tuareg, Foscarini** • From Milan, Italy-based designer Ferruccio Laviani, this floor lamp is made up of branching tubular bars joined with integrated screws. Standing more than 6' tall, the totem-like fixture is equipped with three 4W 3000K LEDs that have a CRI of 90-plus and are situated in 360-degree adjustable housings. Each lamp can be switched on or off individually with touch dimmers. Available in black chrome and orange. • [foscarini.com](http://foscarini.com)



**Para.Mi, Waldmann Lighting** • This streamlined decorative tasklight features a fluid-motion arm for easy manipulation of light across the work surface. Offered with either a round or a square head that is fitted with an 8W LED, providing 600 lumens of wide-angle illumination in 3000K or 4000K with a CRI of 85-plus. The button-operated fixture is offered with a matching round or square base, or clamp, track, and wall-mount options. Offered in white, silver, black, and red colors with gray joinery. • [waldmannlighting.com](http://waldmannlighting.com)



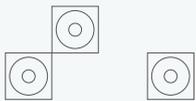
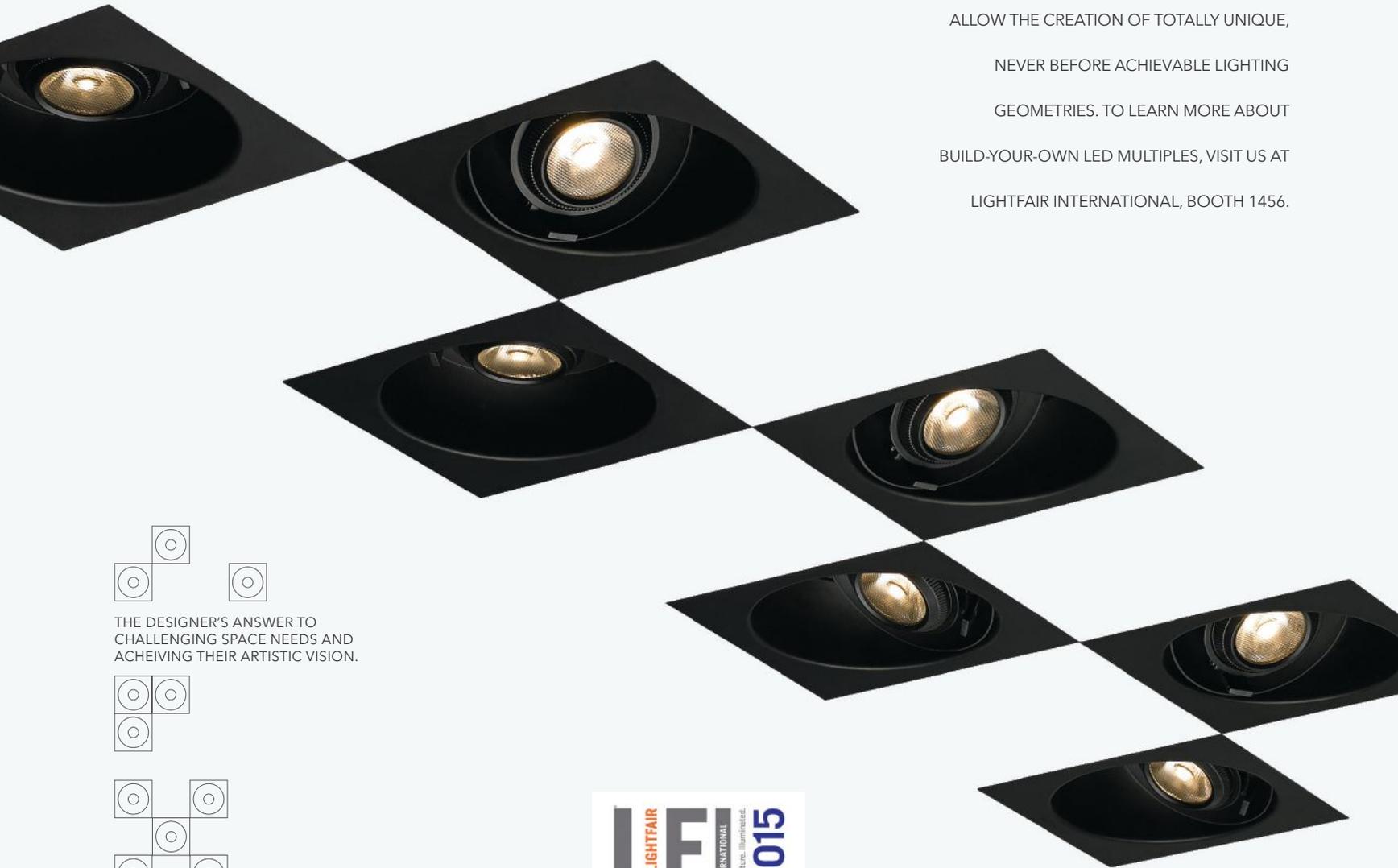
**Mekanic, LBL Lighting** • Mekanic rethinks the industrial cage work light as a decorative pendant. Measuring 14.2" tall and 5.2" wide, the line-voltage fixture is fitted with an 8W recessed LED module in 3000K with a CRI of 80 and that provides 640 lumens. It weighs 2.47 pounds and includes a 6'-long field-cutttable black cord cloth. Finishes options are rubberized black with either a copper or a satin nickel reflector. Dimmable with electronic-low-voltage controls. • [lblighting.com](http://lblighting.com)

# ELEMENT

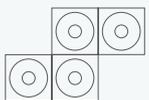
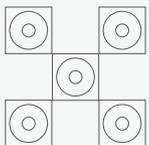
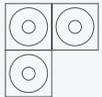
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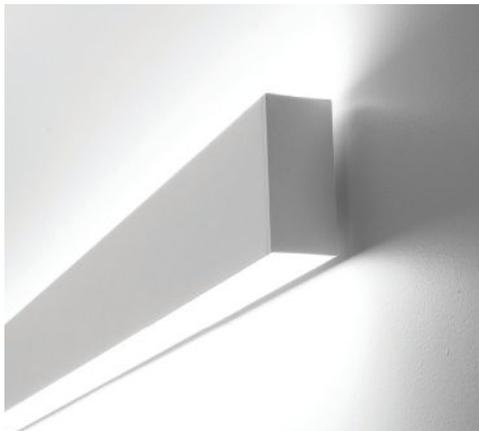
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# DIRECT/INDIRECT

Streamlined luminaires bring diffuse light and attractive forms to hospitality, retail, offices, and more.



**HP-2 LED, Finelite** • This family of 2"-wide-aperture luminaires offers direct/indirect and direct-only illumination from pendant, wall-mounted (shown), recessed, and surface-mounted models. Available in 3000K, 3500K, or 4000K with a constant-current reduction electronic driver that is accessible from below the ceiling and accepts 120V or 277V inputs. Offered in 4', 8', and 12' lengths. An extruded aluminum housing features a snap-in-place frost white diffuser. Dimmable to 10% via zero-to-10V controls. • [fineliteled.com](http://fineliteled.com)



**Indy X-Series, Juno Lighting Group** • These basket-style LED troffers for grid ceilings are offered in 2x2, 2x4, and 1x4 models that each measure 3 $\frac{3}{8}$ " tall. Available in 3000K, 3500K, 4100K, and 5000K with a CRI of 80-plus, they deliver between 3,900 lumens and 5,500 lumens. Accepts 120V to 277V and 347V input and houses a zero-to-10V dimming driver. The fixture has a cold-rolled steel housing with a reflective white finish and built-in earthquake clips. • [junolightinggroup.com](http://junolightinggroup.com)



**Lightplane 3 Round, Architectural Lighting Works** • This 3"-diameter linear LED pendant provides 900, 1,200, or 1,500 lumens per foot and consumes 7W to 14.5W per foot in lengths of 2' to 8'. Available with tunable white or color-changing RGB LEDs as well as standard 2700K, 3000K, 3500K, or 4000K with a CRI of 80-plus. Its extruded-aluminum housing is fitted with a clear, frosted, or opal impact-resistant lens. An integrated Class 2 dimming driver fits within the aluminum extrusion. • [alwusa.com](http://alwusa.com)



**Edge-Lit LED Pendant, Nora Lighting** • Nora Lighting has added a pendant option to its series of Edge-Lit LED 2x2 and 2x4 panels, which can also be surface-mounted or recessed in hard ceilings. Available in 3000K, 4000K, or 5000K with a CRI of 84, the luminaires provide up to 6,071 lumens and consume up to 59.9W. Dimmable down to 5% with zero-to-10V dimming controls, the fixture takes 120V or 277V inputs. It has an extruded-aluminum frame and opalescent lens. • [noralighting.com](http://noralighting.com)



**Stream LED, Prudential Lighting** • Linear LED strips in this recessed luminaire indirectly illuminate a highly diffuse reflector film to direct soft light downward. Available in 3000K, 3500K, or 4000K with a CRI of 83, the single-circuit fixture provides either 544, 765, or 996 lumens per foot; it can also be specified with custom-tunable light levels. In nominal lengths from 2' to 8', it can be installed in hard ceilings, T-bar ceilings, and drywall. An integral 120V-to-277V driver includes zero-to-10V dimming options. • [prulite.com](http://prulite.com)



**Charlotte, Birchwood Lighting** • This 20'-radius curved interior luminaire can be either suspended or surface-mounted and is available in 2700K, 3000K, 3500K, or 4000K in standard, high, or custom lumen outputs. An integral electronic driver accepts 120V or 277V inputs with dimming options including zero-to-10V down to either 10% or 1%. Offered in 8' lengths with an extruded aluminum housing, frosted white or clear lens, and a satin clear anodized finish. • [birchwoodlighting.com](http://birchwoodlighting.com)



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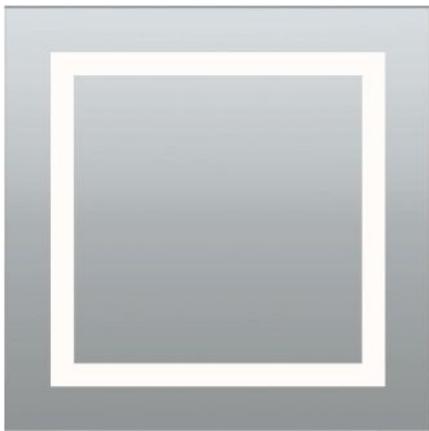
**RZL LED Luminaire, Eaton's Cooper Lighting/Corelite** • This continuous row-mounted LED system is designed for both new and retrofit construction. Available in 3000K, 3500K, or 4000K with a CRI of 85-plus, its lumen output ranges from 3,000 to more than 8,000. Offered in 4', 8', and 12' lengths with five shielding options, the fixtures can be surface-mounted, suspended, or come as a rigid pendant. Includes a zero-to-10V dimming driver, and optional occupancy and daylight sensors. • [cooperindustries.com](http://cooperindustries.com)



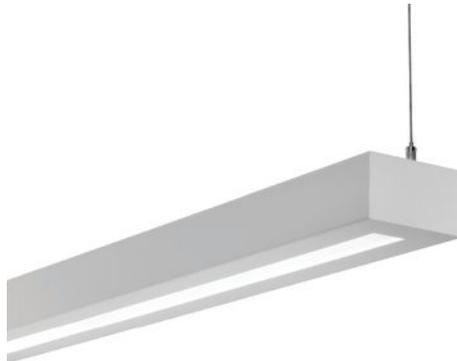
**Reflections V, Dreamscape Lighting** • This semi-recessed, linear LED wall luminaire is designed to illuminate bathroom vanities. Available in 3000K with a CRI of 97, the fixture is housed in an extruded aluminum frame with a curved lens that can be used alone or placed between sections of a 1/4"-thick mirror. Fixture lengths can be specified to meet dimensional requirements. • [dreamscapelighting.com](http://dreamscapelighting.com)



**Avante LED, Acuity Brands/Lithonia Lighting** • This family of direct/indirect recessed LED ceiling troffers comes in 2x2, 2x4, and 1x4 sizes for ambient indoor illumination in 3000K, 3500K, 4000K, or 5000K with a CRI of 80. The fixtures deliver lumen packages from 2,000 to 5,000. The diffusers swing down for access to the light engines and a 120V or 277V dimming driver. Metal baskets, louvers, and extruded acrylic prismatic lenses are backed with white acrylic diffusers. • [lithonia.com](http://lithonia.com)



**Plaza Small LED, Edge Lighting** • Designed to illuminate bathroom vanities, this 27.75"-square, 2"-deep surface-mounted LED mirror offers 2700K with a CRI of 92-plus from behind an inset border of frosted glass. The fixture weighs 39 pounds, and it consumes 100W. Electric-low-voltage dimmable. • [edgelighting.com](http://edgelighting.com)



**Dart, Focal Point** • Available in linear suspended or wall-mounted models, the Dart provides 625 to 1,250 lumens per foot in 3000K, 3500K, or 4000K with CRIs greater than or equal to 80. In run lengths of 4' to 24', the dimmable luminaire comes in a one-piece steel housing with a low-iridescent, semi-specular aluminum reflector and optional acrylic diffuser or prismatic lens. A gradient optic softens cut-off lines while an optional beam-smoothing diffuser adds more softening. Dimming includes zero-to-10V and DALI. • [focalpointlights.com](http://focalpointlights.com)



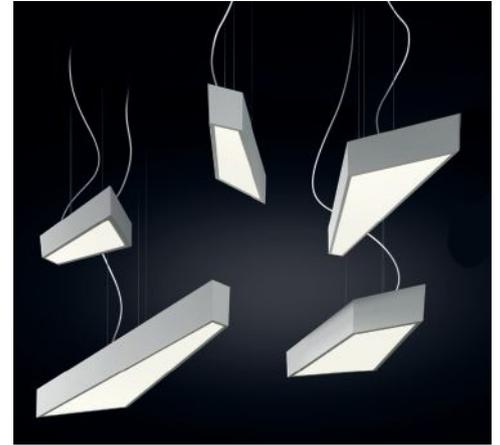
**Liteweave, Hubbell Lighting/Litecontrol** • This slender direct/indirect suspension luminaire features a woven-style diffuser and a flexible printed circuit board. Delivering 70% direct and 30% indirect light, the fixture uses more than 200 LEDs per foot and is offered in 3000K, 3500K, and 4000K with a minimum CRI of 80. A choice of 3,400 lumens or 4,600 lumens is offered per 4' length, with efficacies of up to 101 lumens per watt. The maximum run for a single power feed is 40'. Dimmable via zero-to-10V or DALI controls. • [litecontrol.com](http://litecontrol.com)



**Linea 1.5", Amerlux** • This linear LED luminaire with direct, indirect, and direct/indirect distributions is designed for use with a louver. Available in 2700K, 3000K, 3500K, or 4000K, the fixture comes in lengths of 47¾" and 95¾" with output options of either 5W or 10W per foot. Each luminaire can be suspended via aircraft cables or wall-mounted. An integral electronic constant current 120V-to-277V driver is standard with zero-to-10V dimming. • [amerlux.com](http://amerlux.com)



**BSS110, Bartco Lighting** • This slim-profile linear LED cove light is rotatable in 15-degree increments from -15 degrees to 105 degrees and offers tool-less field adjustability. Available in 3000K, 3500K, 4000K, or 5000K with CRIs of 84 or 85, the dimmable fixture consumes 5W, 7.2W, or 12W per foot. An extruded aluminum housing is fitted with a 20-gauge steel wiring channel and frosted acrylic lens for wide-angle diffusion. Offered in lengths of 23", 34", and 45". • [bartcolighting.com](http://bartcolighting.com)



**Shatter, Axo Light** • Shatter can be suspended, or wall- or ceiling-mounted, and provides diffused, downward direct ambient white light. Its seven fixture models are composed of complimentary polygon quadrilateral forms that come in three sizes. The white-painted aluminum housing has a methacrylate diffuser. Lamped with standard T5 or T5HO lamps, the fixtures have a 120V-to-277V input with zero-to-10V dimming. An integral ballast mounts to the ceiling in the suspended version. • [axolightusa.com](http://axolightusa.com)



**Wing, Sensitile Systems** • This backlit suspended or wall-mounted luminaire delivers either direct or direct/indirect light and features LEDs that provide RGB and warm and cool white light. The fixture features an anodized aluminum housing and can be specified in 12" or 18" widths with single-fixture lengths ranging from 36" to 96". Power for the 12V fixture is provided either via direct wiring or wall outlet and it consumes 5W per foot. • [sensitile.com](http://sensitile.com)



**R1L/R2L Series, LaMar Lighting** • Measuring less than 3" deep, this series of recessed ceiling troffers comes in 2x2, 1x4, and 2x4 sizes and is suited for use in a standard 15¼" inverted T-bar grid and shallow plenum locations. Offered in 4000K, the fixture can also be specified in 3500K and 5000K. The series provides 2,000 lumens from the 2x2 size with a CRI of 80-plus. All fixtures are designed to replace a 32W to 34W fluorescent. • [lamarlighting.com](http://lamarlighting.com)



**Hex for Connected, LightArt** • Designers can use a kit of standard luminaire shapes to configure this modular LED lighting system into a variety of luminous installations. Ten components and more than 1,000 color options are offered. Available in 3000K with a CRI of 81, the luminaire provides 445 lumens per linear foot. Overall installation dimensions are approximately 18" wide by 21' long by 8" high, and it is suspended via 3/64" stainless steel cables. The powdercoated canopy mounts to a standard junction box. • [lightart.com](http://lightart.com)

# DOWNLIGHTS

From standalone modules to multiples, these fixtures offer even illumination.



## Hyperbolic LED Trims, Juno Lighting Group •

Juno Lighting Group's Hyperbolic LED Trims now work with the company's 4", 5", and 6" LED luminaires — which provide either 600, 900, or 1,400 lumens — for low-brightness ceilings with reduced glare. The company says it changed the shape of its reflector from a cone to a hyperbola to take advantage of LED sources' directional nature in order to spread light along the work plane. For use in residential and light-commercial applications. • [junolightinggroup.com](http://junolightinggroup.com)



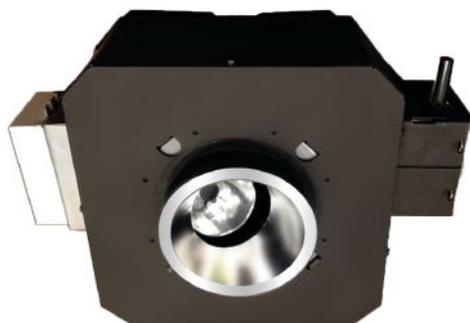
## HL6 Allslope, Eaton's Cooper Lighting/

**Halo** • This system of recessed LED downlights is designed for sloped ceiling applications from 10 degrees to 45 degrees. The luminaire provides 1,200 or 1,800 lumens from its 6" aperture housing and has three interchangeable optics and trim selections. The LED module comes in 19W and 27W in 2700K, 3000K, 3500K, or 4000K with a CRI of 90. • [cooperindustries.com](http://cooperindustries.com)



## Mini-Ritm, Modular Lighting Instruments •

This 4¾"-square LED downlight has a gimbal system that lets designers position the light source directly. For use in streamlined and industrial-chic environments, the fixture is offered in a recessed or a surface-mounted aluminum housing. It connects to a standard 120V power supply and comes with a 50W MR16 lamp. • [supermodular.com](http://supermodular.com)



## Very Narrow Beam Directional, Hubbell

**Lighting/Kurt Versen** • This 8-degree LED point-source downlight provides precise directional accent illumination of more than 17,000 candelas without peripheral spill. Rotatable 360 degrees and vertically adjustable to 35 degrees, the 24W fixture comes standard in 3000K with a CRI of 80. Also available in 2700K and 4000K. Zero-to-10V dimmable down to 10%. • [kurtversen.com](http://kurtversen.com)



## MX Recessed Multiples, Intense Lighting •

These LED multiples come in one-, two-, three-, and four-lamp configurations in a 10"-square recessed, semi-recessed, trimmed, or trimless housing. Each lamp has a 4" aperture and its self-contained assembly allows for plug-and-play installation. With a 12-degree spot, a 24-degree narrow flood, and a 36-degree flood, the fixtures are lamped with 14W LED modules. Available in 2700K, 3000K, 3500K, or 4100K at a CRI of 82 as well as 2700K or 3000K at a CRI of 92. • [intenselighting.com](http://intenselighting.com)



## RLR-5612-JB LED Recessed Downlight, Jesco Lighting •

This shallow recessed downlight is suitable for use in contemporary and transitional interior spaces. At 7¼" square and 3⅞" deep, the 12.8W luminaire is available in 2700K, 3000K, or 4000K. With standard 120V input wires, the fixtures can be daisy chained. TRIAC and electronic-low-voltage dimmable. • [jescolighting.com](http://jescolighting.com)



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**LED CLW DL/4, Edison Price Lighting** • This 4" aperture downlight is 6" deep with a reflector that provides a shielding angle of 40 degrees. The fixture features an integral plastic shield that suits it for use in food-service areas and other applications requiring protection from lamp failure. Available in 2700K, 3000K, 3500K, or 4000K, the fixture provides either 850, 1,250, or 2,000 lumens. Dimmable down to 5% via zero-to-10V, incandescent, or electronic-low-voltage controls. • [epl.com](http://epl.com)



**Fraxion MicroFlange and Trimless, Lucifer Lighting** • This downlight series offers slim, trim flanges with increased coverage for cut-outs. With a 40-degree centerbeam tilt and 361-degree internal rotation, the fixtures can be aimed and locked from below and have no visible fasteners. The LED module comes in 700-, 1,000-, and 1,300-lumen packages with a CRI of 80-plus, and in 500-, 700-, and 1,000-lumen packages with a CRI of 95-plus. Standard zero-to-10V and TRIAC dimmable to 10%. • [luciferlighting.com](http://luciferlighting.com)



**Modul-Aim, Contrast Lighting** • This modular downlight can be combined in various configurations of multiples. Each luminaire is adjustable on a 360-degree swivel and can recline to 40 degrees. Once positioned, the fixture heads can be locked in place with the turn of a single screw. Available in black or white galvanized steel housings, the fixture can be specified with 20W or 40W LED modules in 2700K, 3000K, 3500K, or 4000K at a CRI of 90. • [www.contrastlighting.com](http://www.contrastlighting.com)



**Lumenalpha Downlights, Lumenpulse** • This family of high-performance LED downlights is an alternative to halogen and metal halide fixtures in commercial, residential, retail, and hospitality spaces. Available in 2700K, 3000K, 3500K, or 4500K and delivering up to 3,000 lumens, the downlights have a CRI of 80-plus or 95-plus. Beam angles of 20, 40, and 60 degrees are available. The series includes single and multiple (shown) configurations. • [lumenpulse.com](http://lumenpulse.com)



**LRD3, LumenOptix** • LumenOptix is growing its family of retrofit downlights with this series of 15W to 95W commercial LED fixtures designed to replace 250W and 500W quartz-halogen and 250W and 400W metal halide downlights. Lumen packages from 1,000 to 8,000 lumens are available. Designed for use in spaces with ceiling heights up to 50', the open-architecture platform comes with more than 40 LED module options, optics, finishes, and aperture sizes. • [lumenoptix.com](http://lumenoptix.com)



**BeveLED Flat, USAI Lighting** • At 2¾" deep, the BeveLED Flat offers the thinnest LED housing on the market, according to the company, suiting it for integration with ductwork and other building infrastructure. In round and square profiles, the fixture accepts 12W, 16W, 24W, and 33W LED modules and provides between 800 and 2,350 lumens at a CRI of either 80-plus or 90-plus. • [usailighting.com](http://usailighting.com)

Contrast Sonneman Edge/Pure Philips Lucifer Tech/Element Holtkotter WAC

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## ● DOWNLIGHTS



### **P8022, Hubbell Lighting/Progress Lighting**

This 17W LED downlight is designed for use in flush-mount and 4", 5", and 6" recessed applications in residential and commercial spaces. Available in 3000K with a CRI of 90-plus, the fixture provides 1,032 lumens from a 120V power source that eliminates the need for an LED driver. It measures 7.25" in diameter. • [progresslighting.com](http://progresslighting.com)



### **Graffiti, Specialty Lighting Industries**

This versatile line of LED downlights includes round/flanged, round/flangeless, square/flanged, and square flangeless profiles. Suitable for high-end commercial and hospitality spaces, the fixtures are available with three light-source options—including the company's incandescent-style dimmable Ambient Dim—from 2700K to 4000K with a CRI of 80-plus or 95. • [specialtylightingindustries.com](http://specialtylightingindustries.com)

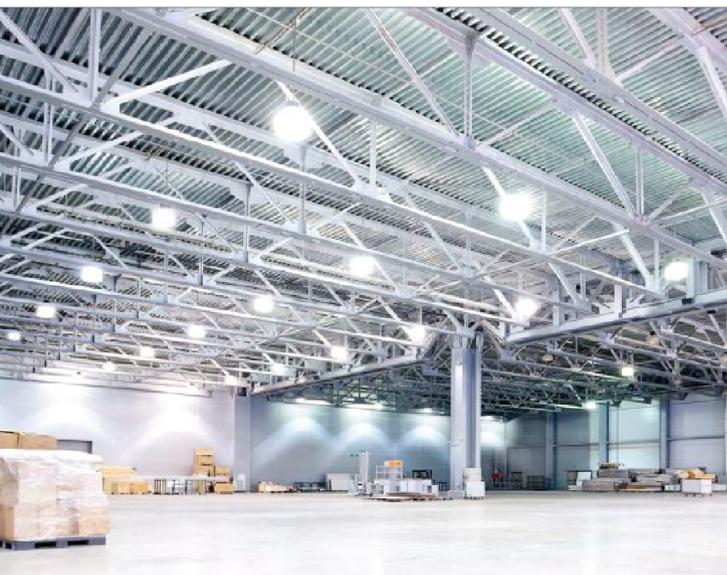


### **Adjustable LED Downlight Retrofits,**

**MaxLite** • This line of LED retrofit downlights fits standard 5" and 6" recessed cans. The lens swivels to 355 degrees and tilts up to 30 degrees vertically. Available in 2700K, 3000K, or 4100K, the 10W LED fixture provides 875 lumens. Suitable for use indoors and in damp locations. • [maxlite.com](http://maxlite.com)



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## RETHINKING FUNCTION

*Integrating new software expands a luminaire's role beyond providing light.*

text by Hallie Busta

**Solid-state lighting's electronic capabilities** are helping luminaires take on new functions, from integrating wireless sensors to hosting video surveillance. Adding such software offers a valuable proposition, streamlining the equipment required for building systems while reducing the physical space needed for installation. But it also raises critical questions, such as how these light fixtures are sold—as hardware, software, or both—and the extent to which they are protected against tampering in the field or by remote access.

That level of integration requires a secure platform. Last year, Amerlux announced a partnership with light-sensory-network developer Sensity Systems to add the firm's sensing and video functionality to its fixtures. So far, this capability is offered with Amerlux's traditional post-top fixtures and some of its site and area lighting, says Gary Harvey, senior product manager at Amerlux. Although public reaction to lighting systems that offer remote control and monitoring has been largely speculative

when it comes to security, Harvey says that clients are savvy to wireless' advantages and disadvantages.

Tom Hinds, lighting product portfolio manager at Cree, agrees. Like Amerlux, Cree works with wireless application providers to ensure that any data collected by the company's SmartCast system, which features integrated wireless sensors for tasks such as occupancy sensing through its luminaires, remains secure. "Security was something that we certainly looked at up front," Hinds says, noting that Cree's platform uses 128-bit encryption that not only protects the data it collects but also helps to prevent unauthorized control of the system.

As more integrated luminaire systems are developed, business models will emerge around the next-gen technology. That will facilitate the development of better infrastructure for connected systems and more test cases to inform many of the concerns, including sales tactics and security, that are starting to arise as these new products enter the market. •



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# INDUSTRIAL

From high ceilings to tight spaces, these sturdy fixtures pack powerful light output in streamlined forms.



**Stellar Clear Prismatic LED Open Low-Bay, Delray Lighting** • This 16" diameter, dimmable low-bay downlight can mount to a standard J-box, suspend from an aircraft cable, or extend from a hard-stem pipe. It delivers up to 6,000 lumens and is available in 3000K, 3500K, or 4000K with a CRI of 92. The fixture is offered in 38W and 71W versions. Finish options are flat white, carbide black, and custom colors. • [delraylighting.com](http://delraylighting.com)



**Aphos Mini Series, Eye Lighting** • This 39W LED luminaire delivers 3,000 lumens in Type II, IIA, III, and V distributions, making it suitable for parking garages, canopies, warehouses, and other applications requiring bright white light. Its rugged design includes IP65-rated optics and an IP67-rated driver, while patented airflow technology draws heat away from the LED array for cooler operation. Available in 4000K or 5000K with a CRI of 70, and in five powdercoat finishes. • [eyelighting.com](http://eyelighting.com)



**ID LED High Ceiling, Focal Point** • Available in 6" or 8" apertures, beam spreads from 30 to 65 degrees, and outputs up to 7,500 delivered lumens, this recessed luminaire is designed for lobbies, atriums, convention centers, and other high-ceiling spaces. It comes in 3000K, 3500K, or 4000K, and consumes 47W to 100W. Multiple dimming options and a 98% reflective cone allow for light control, while passive cooling contributes to its silent operation. • [focalpointlights.com](http://focalpointlights.com)



**Acculite H1 Series, Juno Lighting Group** • An onboard motion sensor for instant on/off and high/low functionality makes this LED luminaire an energy-efficient option for industrial or commercial applications that do not require an enclosed fixture. Offered in three output variations—two boards delivering 8,000 lumens, four boards delivering 16,000 lumens, and six boards delivering 24,000 lumens—all of which provide 4000K at a CRI of 80. • [junolightinggroup.com](http://junolightinggroup.com)



**Polygon Linear LED, MaxLite** • Offered in 4' and 8' lengths, each measuring 4.9" wide and 1.8" high, this low-profile luminaire is designed for parking garages and other low-bay applications requiring a linear lighting arrangement. Each fixture delivers up to 10,498 lumens in either 3500K or 5000K, while consuming 44W, 55W, or 80W; 100V-to-277V drivers provide zero-to-10V dimming capabilities. A soft-white, translucent diffuser reduces glare. • [maxlite.com](http://maxlite.com)



**Tetriss Series, Meteor LED** • Designed to replace 1,000W metal halide lighting systems for applications such as convention centers and airports, this LED fixture comes in four-, six-, and eight-light modules that consume 280W, 420W, and 560W, respectively. Providing 29,100 to 58,000 lumens at 100 lumens per watt, each is available in 3000K with a CRI of 85 and in 4000K and 5000K with a CRI of 75. Each 5" light engine produces 7,200 lumens and is IP66-rated for outdoor use and wet locations. • [meteor-lighting.com](http://meteor-lighting.com)



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# LAMPS AND BALLASTS

Replacement lamps offer higher efficacy while using less energy than their predecessors.



**LED NUP-PAR38, Lattice Power** • These PAR38 lamps feature GaN-based LEDs on a silicon substrate to improve light density and a thermal-pipe sink to dissipate heat without the need for active cooling. Each 27W lamp provides up to 2,000 lumens in 2700K, 3000K, 4000K, and 5000K with a CRI of 80. An alternative to 150W-maximum halogen source options in commercial spaces with high ceilings, the lamps offer 25- and 40-degree beam angles and fit an E26 base. • [latticepower.com](http://latticepower.com)



**Ultra Pro & Ultra Pro HD PAR LED Lamps, Osram Sylvania** • These LED PAR lamps offer a power factor and characteristics similar to the candlepower and soft edges of the halogen lamps they are intended to replace. Available in 7W, 10W, 13W, and 17W versions that provide 2700K, 3000K, 3500K, and 4000K at a CRI of either 82 or 92, and with 12-, 15-, 25-, and 40-degree beam angles. Dimmable down to 5%, the lamps use 86% less energy than their halogen alternatives, according to the company. • [sylvania.com](http://sylvania.com)



**LED Bi-Pin Replacement Pendant Module, Generation Brands** • Generation Brands collaborated with LED manufacturer Soraa on this bi-pin replacement module that will be offered under the company's Tech Lighting and LBL Lighting lines. Two 8W versions of the module are available: one that produces 500 lumens in 3000K with a CRI of 80, and another that produces 375 lumens in 2700K with a CRI of 95. Dimmable to less than 10% with electronic and magnetic transformers. • [generation-brands.com](http://generation-brands.com)



**LED Omni A19, Litetronics** • Designed to meet Energy Star V1.1, this LED lamp uses 80% less energy than the 40W or 60W A19 incandescents it is designed to replace, its maker says. The lamp is available in two frosted-white modules that each offer 2700K: a 4.3"-tall-by-2.4"-wide 7W version that produces 475 lumens as well as a 4.4"-tall-by-2.4"-wide 12W version that generates 800 lumens. Both offer 300-degree light distribution, turn on to instant full brightness, and dim with standard switches. • [litetronics.com](http://litetronics.com)



**PAR30, GE Lighting** • An alternative to conventional ceramic metal halide lamps in retail applications, GE Lighting's PAR30 is fitted with light-enhancing technology tuned to draw out bright whites and bold colors without glare. Each 12W lamp delivers 650 lumens at 2850K and with a CRI of 95. They are offered in 15- and 25-degree beam patterns and emit less ultraviolet and infrared than halogen or incandescent lamps, reducing the risk of fading. The lamps are dimmable down to 20%. • [gelighting.com](http://gelighting.com)



**S38 Tunable Lamp, Ketra** • With onboard wireless technology, Ketra's S38 Tunable Lamps offer a range of adjustable 90-plus CRI white, pastel, and saturated colors. Each LED lamp delivers up to 900 lumens and offers closed-loop color-point maintenance to less than a one-step MacAdam ellipse in its lifetime. Wireless and TRIAC dimmable to 0.1%, the lamps have beam angles from 10 degrees to 60 degrees and can be programmed to specific color temperatures and dimming curves, among other features. • [goketra.com](http://goketra.com)



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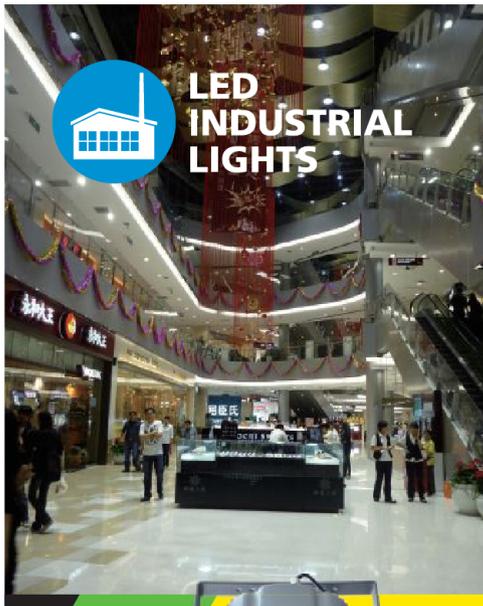


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## LED INDUSTRIAL LIGHTS



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## LAMPS AND BALLASTS



**MR16 Series TrueWhite LED Lamps, Cree** • Cree says its MR16 Series of LED lamps consumes up to 83% less energy than 50W halogens while offering a soft, glare-free diffused light. The lamp delivers more than 580 lumens in 3000K and has a CRI of 92. It is also available in 15-degree spot, 25-degree flood, and 40-degree wide flood beam angles, and is dimmable to 5%. A 1.97", ANSI-compliant form factor facilitates one-for-one lamp replacement. • [cree.com](http://cree.com)



**SlimStyle BR30, Philips** • This indoor BR30 LED lamp replaces 65W incandescent floodlights. Its thin form factor offers uniform light distribution while conducting heat away from the LEDs to require a minimal heat sink. Consuming 9.5W to produce 650 lumens in 5000K, the dimmable lamp fits an E26 base and uses 85% less energy than its incandescent predecessor, according to Philips. • [philips.com](http://philips.com)



**Optical Light Engines, Soraa** • Compatible with many industry-standard drivers and suitable for enclosed, non-ventilated indoor and outdoor luminaires, Soraa's full-visible-spectrum GaN-on-GaN low-profile light engines produce high center-beam candlepower from narrow spot to flood. Offered in 1.5", 2", and 4" diameters, 500 and 1,000 lumens, in 2700K, 3000K, 4000K, and 5000K, and with a CRI and deep red rendering of 95. • [sorraa.com](http://sorraa.com)



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# LEDS AND DRIVERS

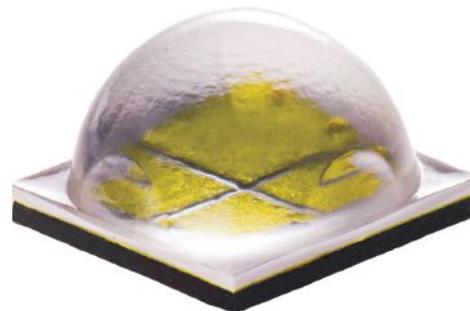
Higher efficacy and smaller form factors are expanding uses for LED light-source technology.



**Slim Cove INT, EcoSense Lighting** • This streamlined, line-voltage LED strip is suited for coves and other linear lighting applications and comes in 6", 12", and 48" lengths. Available in 2700K, 3000K, 3500K, or 4000K with a CRI of 80-plus, the luminaire consumes 3.5W per foot and has a 120-degree square beam spread. It measures 1.37" wide and 0.93" tall with mounting clips and a polycarbonate housing and lens. • [ecosenselighting.com](http://ecosenselighting.com)



**FlexArray Side Lit Tape, Feelux** • LEDs are mounted on the edge of this low-voltage strip to provide concentrated side lighting for horizontal and curved applications. The field-cutttable flat conductor strip houses 36 LEDs per foot and is available in 2200K, 2400K, 2700K, 3000K, 4100K, or 6000K. It delivers up to 50.45 lumens per watt at 2.9W per foot, and comes in 16.4' spools that can be cut every 1.97". Color consistency is within a two-step MacAdam ellipse. For use indoors and outdoors. • [feelux.com](http://feelux.com)



**XLamp XHP LEDs, Cree** • Cree's new line of LED modules come in two versions: 19W that provides 2,546 lumens at 5mm square and 32W that provides 4,022 lumens at 7mm square. Available in two- and three-step bins for 2700K through 3500K at CRIs of either 80 or 90. The streamlined modules' solder-pad design allows for either 6V or 12V configurations from the same LED, while enabling manufacturers to use a smaller circuit board and a more minimal heat sink and housing when incorporating them into luminaire designs. • [cree.com](http://cree.com)



**PrevaLED Cube Gen II, Osram Sylvania** • This high-powered, square light engine has integrated optics for use in recessed downlights, and low-bay and surface-mounted luminaires. Compatible with most heat sinks, fixture-mounting holes, reflectors, and other accessories. Each 3.2" by 3.3" module measures 0.8" tall and has a beam angle of 110 degrees. Fully dimmable, it comes in 2700K, 3000K, 3500K, 4000K, or 5000K with a CRI of 80-plus, and delivers 1,100 lumens, 2,000 lumens, or 3,000 lumens. • [sylvania.com](http://sylvania.com)



**Color Tuning Module, Lumenetix** • Five LED color strings deliver dimmable, tunable white light at a CRI of 90-plus across a tuning range of 1650K to 4000K for this 50mm-diameter module. Gradients of saturated colors from 1% to 100% can be added to color points within the tuning range. An onboard closed loop optical feedback measures the lumen depreciation of each channel and re-balances the color model. Dimming options include zero-to-10V, DALI, and DMX controls. • [lumenetix.com](http://lumenetix.com)



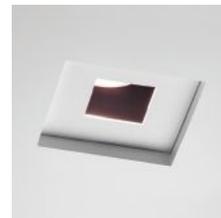
**XIM with Integrated Dimming Driver, Xicato** • This LED light engine integrates a dimming driver and uses onboard technology to monitor LED temperature and electronics, triggering a protection mode if the maximum temperature is exceeded. Available from 2700K to 4000K in a CRI of 83 or 98, it delivers from 1,300 lumens at 13.1W to 2,000 lumens at 21.2W. Dimming options include DALI and 1V-to-10V systems. A 48V, constant-voltage power supply is required. • [xicato.com](http://xicato.com)



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Providing superior lighting solutions to the design community, No. 8 Lighting's LED luminaires outperform the other downlights in installation, operation and function.

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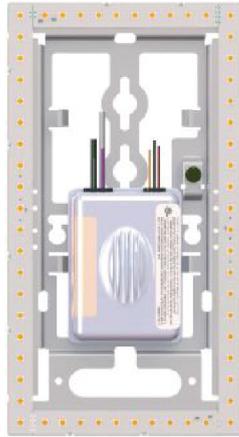
[8lighting.com](http://8lighting.com)

ROOM PHOTO: MATTHEW MILLMAN

# LEDS AND DRIVERS



**Everline Light Engines, Universal Lighting Technologies** • This family of LED light engines is suited for use in a variety of general and specialty fixture applications and ranges from 2700K to 5000K with CRIs of greater than 80 or 90. Configuration options span a 365-lumen, 6"-linear system to a 14,000-lumen downlight engine. Models include linear strips, round-pattern chips, square, and a constant-voltage chain. • [unvlt.com](http://unvlt.com)



**SR95, TerraLux** • Replacing pin-based CFLs and ballasts in existing commercial wall sconces, this surface-mounted LED kit includes drivers and patented thermal protection and is suited for constant-use applications such as hallways, lobbies, and stairwells. Available in 2700K, 3000K, 3500K, or 4000K with a CRI of 80-plus, the installed kit delivers up to 110 lumens per watt and is dimmable via zero-to-10V controls. Input power can be either 120V or 277V AC. • [terralux.com](http://terralux.com)



**ThoroLED Retrofit Kits, Fulham** • Designed for use with 7" and 9" rounds, these TRIAC dimmable LED light engines can fit most standard fixtures for retrofit applications. All required hardware and installation instructions, as well as the LED and driver, are included. The RoHS-compliant kits are cULus classified, suiting them for field or factory installation. Available in 80 or 90 CRI and in color temperatures from 2700K to 5000K. • [horse.fulham.com](http://horse.fulham.com)



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Patent design from Signcomplex. 230° large beam angle to replace fluorescent tube.
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UL, DLC, TUV, SAA and RoHS compliant.
- Can provide emergency tri-proof lamp?  
Available.
- Available with 0-10V and DALI?  
Yes.
- Hmmm, any more? Let me think.  
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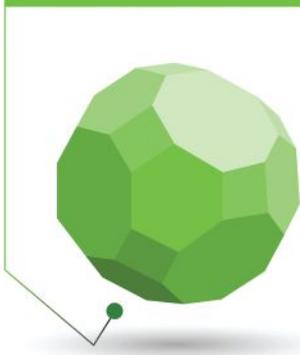
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## OUTSIDE INFLUENCES

*Internet-connected replacement lamps bring new players to the lighting market.*

text by Hallie Busta

In the past few years, consumer-focused LED replacement lamps and their app-based controls have evolved from novelty gadgets to specifiable products. That shift was, arguably, led by the debut of the Philips Hue connected lighting system in October 2012 and followed by a stream of venture capital-backed tech startups putting out similar products. Now, most leading lighting manufacturers offer Internet-connected replacement lamps, and many hope that greater consumer familiarity with connected lighting will pay off with commercial adoption of large-scale systems.

“Part of our consumer strategy is getting [them] to adopt [connected lighting] so that they become drivers in the commercial marketplace,” says Mike Watson, vice president of product strategy at Cree.

In January, Cree announced its dimmable Connected Cree LED 60W replacement lamp, which is compatible with Wink and ZigBee software platforms and can be controlled from a companion app. In April 2013, General Electric announced a partnership with Web-based product-

development startup Quirky, whose Wink platform can connect a variety of smart-home products made by its own and third-party developers. Among them are GE Lighting North America’s recently introduced Link Connected LED A19, BR30, and PAR 38 replacement lamps. Osram Sylvania is also developing connected lighting. Last fall, the company teamed with Internet-connected devices developer Belkin for its Lightify Connected Lighting Portfolio, which debuted earlier this year at the International Consumer Electronics Show (CES) in Las Vegas—a magnet for the burgeoning market for smart-home products and a platform that mixes legacy firms and startups on the same trade show floor.

As was evident at CES, lighting is just the beginning. “Within the next year, you’re going to be looking at many, many more [connected] devices than just lighting,” Watson says. “Lighting is a good driver of the connected home, but the real value is when multiple devices can connect to each other.” •

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Powerful LED wall washers with up to 8700 lumens.

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YEARS OF  
EXCELLENCE

# LIGHTING CONTROLS

These interfaces manage more than just light across a range of applications.



**GLDALI SpaceBuilder, Crestron** • This reconfigurable system is designed to control lighting in medium to large spaces. Its components are preprogrammed and shipped together. A startup module with a 7" touchscreen simplifies zone and sensor configurations. It controls up to 64 fixtures and up to 128 individual DALI ballasts or drivers. A maximum of four keypads, occupancy sensors, and open-loop daylight sensors can be added. • [crestron.com](http://crestron.com)



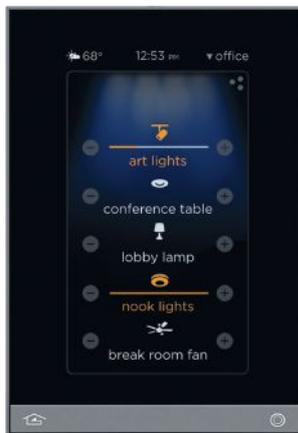
**Decora Rocker Slide Universal Dimmers, Leviton** • Leviton has added these low-profile universal dimmers to its Decora line. For single-pole and three-way applications when used with a three-way switch, they provide full-range dimming for incandescent, LED, CFL, halogen, magnetic-low-voltage, electronic-low-voltage, and fluorescent loads. They also provide speed controls for the new Decora Quiet Fan. They fit in a standard wallbox and work in multi-gang installations with other Decora products. • [leviton.com](http://leviton.com)



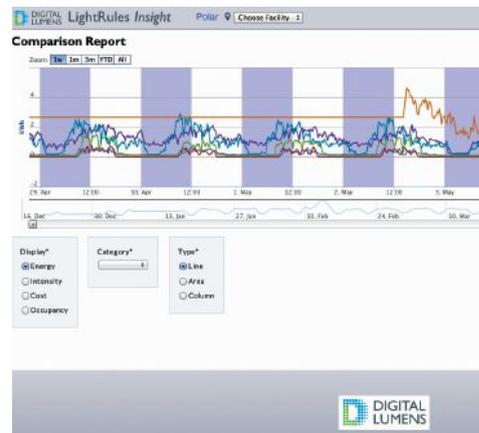
**Fresco Show WM, Acuity Brands/Acuity Controls** • This standalone, 7" DMX512 touchscreen controls dimmers, relays, automated fixtures, and white, tunable white, and multicolor LED luminaires in spaces such as restaurants, museums, and ballrooms. It mounts into a standard three-gang wall-box and integrates with button stations, serial inputs, contact closures, and sensors. Controls up to four DMX512 universes and edits intensities, color, positions, shapes, and timing without a computer or console. • [acuitybrands.com](http://acuitybrands.com)



**Fixture Mount DALI Sensor, Enlighted** • This sensor turns conventional lamps into smart fixtures. Designed to fit in a 0.5" knockout in indoor fixtures, less than 0.28" of the sensor is visible once installed. The programmable device offers occupancy-, photo-, and thermal-sensing technology. With a 150' wireless range, it collects and communicates data to Enlighted's networked management systems. • [enlightedinc.com](http://enlightedinc.com)



**Equinox 41, Vantage** • Equinox 41 is part of Vantage's Equinox family of unique user interfaces. It fits in a single-gang wall box and offers 12 widgets, including lighting, temperature, audio, video, security, timers, and shade control, in a single device. Through its 4" LCD touchscreen interface, multiple users can create personalized profiles. Ideal for high-end residential and commercial applications. • [vantagecontrols.com](http://vantagecontrols.com)



**LightRules Insight, Digital Lumens** • A cloud-based solution, LightRules Insight integrates operational and performance data from multiple facilities into a single interface for sharing within an organization. Building subsets, such as rooms, production lines, and merchandise aisles, can be called out for reporting. The application is part of the company's LightRules family, which is compatible with Internet Explorer, Firefox, Chrome, and Safari browsers. • [digitallumens.com](http://digitallumens.com)



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## ● LIGHTING CONTROLS



### **NX Intelligent Room Controller, Hubbell Lighting/Hubbell Building Automation** •

This plug-and-play system is designed for spaces that require room-level lighting control, such as classrooms and personal offices. It installs in the controlled area's plenum and communicates using standard CAT-5 patch cables with RJ-45 connectors. Up to eight NX controllers can be connected. Complies with ASHRAE 90.1, the International Energy Conservation Code, and California's Title 24. • [www.hubbell-automation.com](http://www.hubbell-automation.com)



### **MechoNet Network Interface, MechoSystems** •

This RS-485-based, low-voltage network allows controls, switches, and motors from different manufacturers to communicate with one another. The hub mounts in a 4<sup>11/16</sup>" junction box and harmonizes motorized window coverings and associated systems throughout an entire building. It features two-way communication, wireless control through the RF or IR of third-party interfaces and remotes, and a repeater function to extend floor networks by as much as 4,000 feet. • [mechosystems.com](http://mechosystems.com)



**Palladiom QS, Lutron** • Flush buttons and a customizable design contribute to a streamlined interface that suits this keypad for use controlling window treatments, temperature, and equipment in high-end residences and commercial applications such as hotel guest rooms and restaurants. Its faceplate and buttons are both offered in multiple colors and materials, including plastic, glass, and metal. Adjustable backlighting makes the panel visible in low-light conditions. Compatible with the company's HomeWorks QS, Quantum, and myRoom control systems. • [lutron.com](http://lutron.com)



[www.perox.com.hk](http://www.perox.com.hk)



**Titlux SR'**



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Perox Lighting is a Hong Kong based company with manufacturer located in Shenzhen, China. The unique design of our products and services to create light that increases the value of its surroundings along with the technologies necessary to ensure the optimal projection of such illumination.

**Titlux and Mega** (trimless) series offer single and double recessed luminaires equip with high power Sharp LED and changeable (12°, 24° & 36°) reflector kit which give high focus for visual display to replace the old shop lighting for using metal halide lamps.



## COLOR TUNING

*Lighting manufacturers are investing in tunable technology across their portfolios.*

text by Hallie Busta

The goal for interior LED lighting has long been to emulate incandescents in color performance—particularly the warm, steady glow they offer when dimmed. But solid-state lighting’s potential remains its ability to be adjusted, post-installation, to meet a space’s changing needs. Manufacturers are now developing color-tunable fixtures, giving specifiers greater control over their lighting choices.

USAI Lighting in New Windsor, N.Y., is among them. Its Infinite Color+ provides tunable white light and a full color spectrum via an architectural downlight. The challenge was ensuring it didn’t behave like a typical theatrical fixture, which combines white, red, green, and blue LEDs and doesn’t deliver a pure white light. “We actually started with white and then added the RGB later,” USAI president Bonnie Littman says. For its Color Select control platform, USAI developed its own circuitry and algorithms to ensure that the system worked with everything from a simple wall control to a complex dimming system.

Tunable color must be available across an application, says Jeff Spencer, product management and market development director at Juno Lighting Group, in order for the technology to meet its value proposition of helping to improve occupant performance in workspaces and classrooms, reducing medical patients’ recovery time, improving visual comfort in a space throughout the day, and more. Juno’s Indy ChromaControl LED technology can integrate with luminaires such as downlights, wallwashers, and adjustable accent lights to provide black body dimming and white- and color-tunability.

Both Spencer and Littman see a staying opportunity for tunable light. “If the price and performance is right, there may certainly come a time when specifying a light fixture that does not have tunable white or color-tuning capabilities may be as unusual as buying a car without electronic windows,” Spencer says. “It used to be considered a luxury, but now it’s a standard feature.” •

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# OUTDOOR

From floodlights to bollards, these fixtures illuminate a range of exterior spaces.



**Kick, Hubbell Lighting/Architectural Area Lighting** • With an angular design that mitigates uplight, backlight, and glare, the LED Kick is suitable for walkways and building entrances. Delivering up to 12,880 lumens, it is offered in 3000K and 4200K, both with a CRI of 80-plus, and 5100K with a CRI of 70-plus. In 4" and 5" widths, with three optical distributions and three mounting options: integral pole, tenon mount, and side mount. Features integral surge and thermal protection and zero-to-10V dimming. • [ael.net](http://ael.net)



**Ledra Step, Bruck Lighting/Ledra Brands** • This 2W LED steplight is available in 3000K and amber and accepts 120V to 240V AC. The IP65-rated fixture measures 4<sup>3</sup>/<sub>4</sub>" by 3", fitting standard J-boxes in vertical and horizontal orientations. Finished in brushed nickel, antique bronze, and white colors. Faceplate options include white opal, vertical/horizontal louver, and vertical/horizontal louver scoop, while the outer trim plate can be changed for a dual-color design. • [brucklighting.com](http://brucklighting.com)



**Evolve EASB Area Light, GE Lighting** • The latest addition to GE Lighting's Evolve LED area lighting series features optics designed for high-output exterior applications such as auto dealerships, reducing offsite visibility while diminishing onsite glare. The fixture offers 4000K and 5700K at a CRI of 70. IP65-rated, the luminaire can be fitted with a motion sensor to help comply with California's Title 24. • [gelifighting.com](http://gelifighting.com)



**Rincon Pedestrian Lighting, Forms+Surfaces** • A contemporary profile and stainless steel construction make this streamlined luminaire an option for lining walkways and other pedestrian-centric spaces. The 4.5"-square column rises to 117" over a 7.5"-square base plate and escutcheon, with a white-frosted acrylic lens topped with a stainless steel cap. Its 30W LEDs offer 3000K and 4000K. The driver is IP66-certified for waterproofing and Class 2-rated for output. • [forms-surfaces.com](http://forms-surfaces.com)



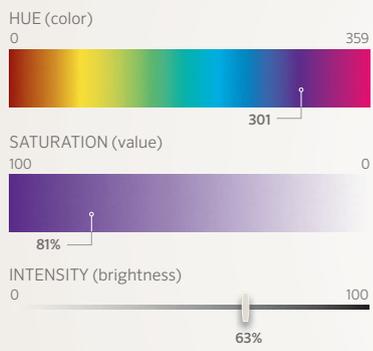
**Night Falcon, Eaton's Cooper Lighting/Lumark** • Available in packages of 9,400 and 14,600 lumens, this floodlight is suited for illuminating building façades, signs, and exterior vertical displays. It is offered in 4000K, as well as 3000K and 5700K, all with a minimum CRI of 70. UL wet-location listed and IP66-rated, the fixture has a weather-resistant finish and comes with two mounting options. • [cooperindustries.com](http://cooperindustries.com)



**Gecko, Erco** • Measuring 9<sup>7</sup>/<sub>8</sub>" from base to top, this compact luminaire offers six light distributions for use illuminating façades, entryways, monuments, and within parks. High-powered 8W to 18W LEDs provide 3000K or 4000K. A slightly conical head rotates 360 degrees and tilts 130 degrees for precise positioning. The fixture is IP65-rated and features a non-reflective safety glass lens. • [erco.com](http://erco.com)



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Zoning and Dimming **+ Color**



A Spectrum of 30,000 Possibilities

**The new Luxor<sup>®</sup> ZDC gives you all the zoning and dimming capabilities of the Luxor ZD + Color.** With the ZDC lighting controller, you can create more than just a few basic colors – you can create any color imaginable using a spectrum of 30,000 possibilities. Now, you can customize outdoor lighting colors for any occasion using the Luxor ZDC, and control it with optional Wi-Fi configuration for the ultimate lighting experience.

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**American Revolution LED Series 247CL, Acuity Brands/American Electric Lighting**

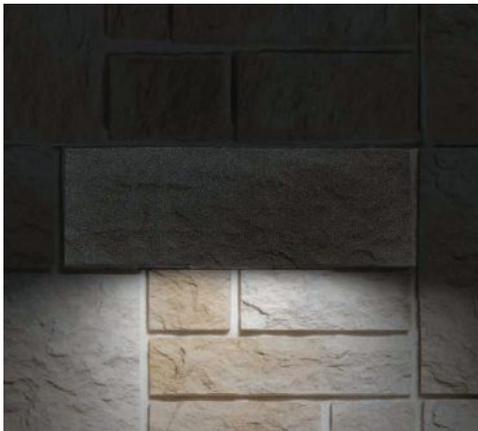
The classic design of this pole-top luminaire suits it for residential areas, city streetscapes, and green spaces. Available in six lumen packages, downward-directed LEDs deliver more lumens than a typical 100W high-pressure sodium fixture, the company says, while consuming up to 73W. It comes in 10 and 20 full-cutoff LED modules in 3000K, 4000K, and 5000K. • [www.americanelectricalighting.com](http://www.americanelectricalighting.com)



**Linea S, HessAmerica** • Emitting zero uplight at or above 90 degrees horizontal, this compact bollard is ideal for upscale residential and commercial areas, as well as applications concerned with light pollution. It comes in 24", 30", and 36" heights, with single or twin heads. Its LEDs deliver 3000K and 4000K with a CRI of 80-plus, while consuming 23W. The driver accepts 120V to 277V and offers optional dimming via zero-to-10V functionality. • [hessamerica.com](http://hessamerica.com)



**Dyna Drum HO and HO QW, Acclaim Lighting** • With an adjustable yoke, an onboard digital display, and a 100V-to-277V AC internal power supply, these IP66-rated luminaires are fit for façade lighting and large-scale floodlighting. The Dyna Drum HO is offered in RGBW and single-color versions in 2700K, 3000K, 3500K, 4000K, and 5500K, with a lumen range from 9,000 to 17,232. The Dyna Drum HO QW flood is offered with 26 10W high-power, quad-color RGB LEDs and a 6000K white. • [acclaimlighting.com](http://acclaimlighting.com)



**Mimik 20 Flat, Performance In Lighting**

At 1.65" deep, this wall-mounted fixture offers discreet direct, indirect, or direct/indirect illumination. Available in 3000K and 4000K, with integral zero-to-10V dimming. IP65-rated and UL wet-located listed, it has a copper-free die-cast aluminum housing and faceplate, stainless steel fasteners, and a micro-prismatic tempered glass diffuser. Iron gray, steel gray, and textured white finishes are offered. Façade materials and finishes can be applied to the luminaire's front. • [pil-usa.com](http://pil-usa.com)



**Vaya Flood HP, Philips Color Kinetics**

This 13.9"-square LED floodlight is suited for façades, bridges, monuments, and other exterior accent lighting applications. An RGB model delivers 3,500 lumens when all colors are on full and consumes 105W. A 3000K and 4000K version delivers 9,700 lumens and consumes 100W. Both models feature an integrated tilting surface-mount base, standard beam angles of 10 degrees and 20 degrees, and an IP66 rating. • [colorkinetics.com](http://colorkinetics.com)



**ArcheType X Wall, Hubbell Lighting/Kim Lighting**

The LED emitters in this outdoor wall luminaire can be adjusted in either the factory or in the field to 355 degrees horizontally and 70 degrees vertically. Available lumen packages range from 10,500 to 30,000 in 2000K, 3000K, 4200K, or 5100K. Each of the three models offered hosts six LEDs and features rotating and tilting capability for uplighting and downlighting. • [kimlighting.com](http://kimlighting.com)

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## MEGALUM

### DOWNLIGHT | CYLINDER

High lumen downlighting up to 16,500 lumens

Designed for ceiling heights up to 60ft and above, the Prescolite Megalum is the highest output LED downlight (MD8LED) and cylinder (MC10LED) in the market.

With an extensive variety of outputs, beam angles, kelvin temperatures, and control options, the Megalum can be configured for a multitude of high ceiling applications.



<http://www.prescolite.com>



Bob Jones University- Greenville, SC



**LED Bullet Flood Lights, MaxLite** • For illuminating landscapes, façades, and outdoor signage, this floodlight can replace up to 150W metal halide and 75W quartz halogen fixtures. It is available in 3000K and 5000K, both with NEMA 5x5 field distributions. The fixtures mount directly to electrical boxes and posts and feature a locking swivel arm. Die-cast aluminum housing and tempered, shatter-resistant glass provide durability. Sealed to resist dirt, bugs, and moisture. • [maxlite.com](http://maxlite.com)



**Balthus LED Outdoor Luminaire, Modern Forms** • Available in 13<sup>1</sup>/<sub>4</sub>" and 16<sup>1</sup>/<sub>2</sub>" models, this LED sconce provides up to 481 lumens in 3000K with a CRI of 90. It has an oil-rubbed bronze finish and a mouth-blown, hammered clear glass diffuser. California Title 24-compliant and UL wet-location listed, the fixture dims with an electronic low-voltage dimmer. • [modernforms.com](http://modernforms.com)



**5-Spot, Insight Lighting** • Measuring 5" in diameter with optical beam distributions of 7, 15, 30, 45, and 100 degrees, this floodlight is suitable for accent lighting applications such as architectural niches, columns, and landscaping. It consumes 19.8W to deliver up to 807 lumens and is available in 2700K, 3500K, and 4000K and static red, green, blue, amber, and RGB and RBGW color-changing options. The luminaire offers peak candlepower of more than 42,000 candelas. Its head rotates for additional control. • [insightlighting.com](http://insightlighting.com)



**Lightify LED GardenSpot Mini RGB, Osram Sylvania** • This accent lighting system includes a 14'-long starter kit with nine fixtures and a 4<sup>1</sup>/<sub>2</sub>'-long expansion kit with three fixtures. The system syncs wirelessly with existing Wi-Fi networks, allowing for wireless adjustment of functions such as light color via a free companion app. The starter kit consumes 35W and the expansion pack uses 7W. Maximum 28' length per power supply. • [sylvania.com](http://sylvania.com)



**Signal, Landscape Forms** • Part of the company's 35 Collection of outdoor fixtures, this cast aluminum luminaire comes in streetscape and pedestrian versions. Each holds multiple tripod arrays of LEDs covered by separate lenses to aid in replacement and repair. Available in 3000K, 3500K, and 4000K. In 12' and 16' pole heights for the pedestrian model and 20' and 25' pole heights for the streetscape model, both versions are available with one or two fixture heads. • [landscapeforms.com](http://landscapeforms.com)



**MiniView Roadway, Philips** • This roadway lighting system delivers lumen packages of 2,700 to 5,500 to replace 70W to 100W high-intensity discharge fixtures. Designed to produce zero uplight, it is also fitted with side shields that limit light spill. The dimmable fixture's optics allow for wider pole spacing than is typical in the category, the company says. • [philips.com](http://philips.com)



CASSIN AND BOBO 3 PENDANTS, CHROMA Z25 SPOT



608 BUFFALO SERIES, WITH CORONA RING



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- Architectural linear and circular pendants
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- Large, unique, high design, pendants



LEDRA brands is celebrating 15 years of innovation using LED technology. We would like to thank all of our loyal partners, employees, customers and representatives for years of growth and success. It has truly been a pleasure with much more to come.



**CFT500, We-ef Lighting** • This post-top luminaire features a ring-shaped form factor to match a range of design styles for lighting outdoor spaces such as footpaths, parking areas, and parks. It delivers 4,536 nominal lumens but can achieve up to 8,294 lumens with 72W and 700mA forward current. It is available in 3000K and 4000K and offers symmetrical light distribution. • [we-ef.com](http://we-ef.com)



**Arceos Series Floodlight, Hubbell Lighting/Spaulding Lighting** • The company has added two lumen packages to its Arceos line of high-performance architectural floodlights, offering up to either 9,535 lumens or 19,368 lumens in 3000K, 4200K, or 5100K with a CRI of 80, 70, and 67, respectively. A vented housing isolates the LED module from the driver. The fixture is IP65- and IP66-rated and features a die-cast aluminum housing with seven finish options. • [www.spauldinglighting.com](http://www.spauldinglighting.com)



**Razar, U.S. Architectural Lighting** • For illuminating roadways and expansive public areas, Razar offers module configurations of 24, 40, 48, and 80 LEDs at 39W to 260W and with lumen packages from 4,082 to 24,444 lumens. The LED modules are field-rotatable in 90-degree increments. Single to quad-head mounting helps maximize site coverage. The roadway and area fixture is offered in two sizes: one that is 14.75" wide by 28.25" long by 2.75" deep, and another that is 11.5" wide by 22" long by 2.5" deep. • [usaltg.com](http://usaltg.com)



**BFL Exterior, Acolyte Industries** • This fixture, designed for façade illumination, comes in a 72-LED 180W model and a 108-LED 250W model. LED options include RGB, RGBW, 3000K, 4100K, 6000K, red, amber, green, and blue along with a range of beam angles. The 72-LED white option delivers 7,901 lumens and the 108-LED white option delivers 16,111 lumens. IP65-rated with an aluminum-alloy housing, and a tempered glass diffuser. An integrated 700mA constant-current driver allows for daisy chaining. • [acolyteled.com](http://acolyteled.com)

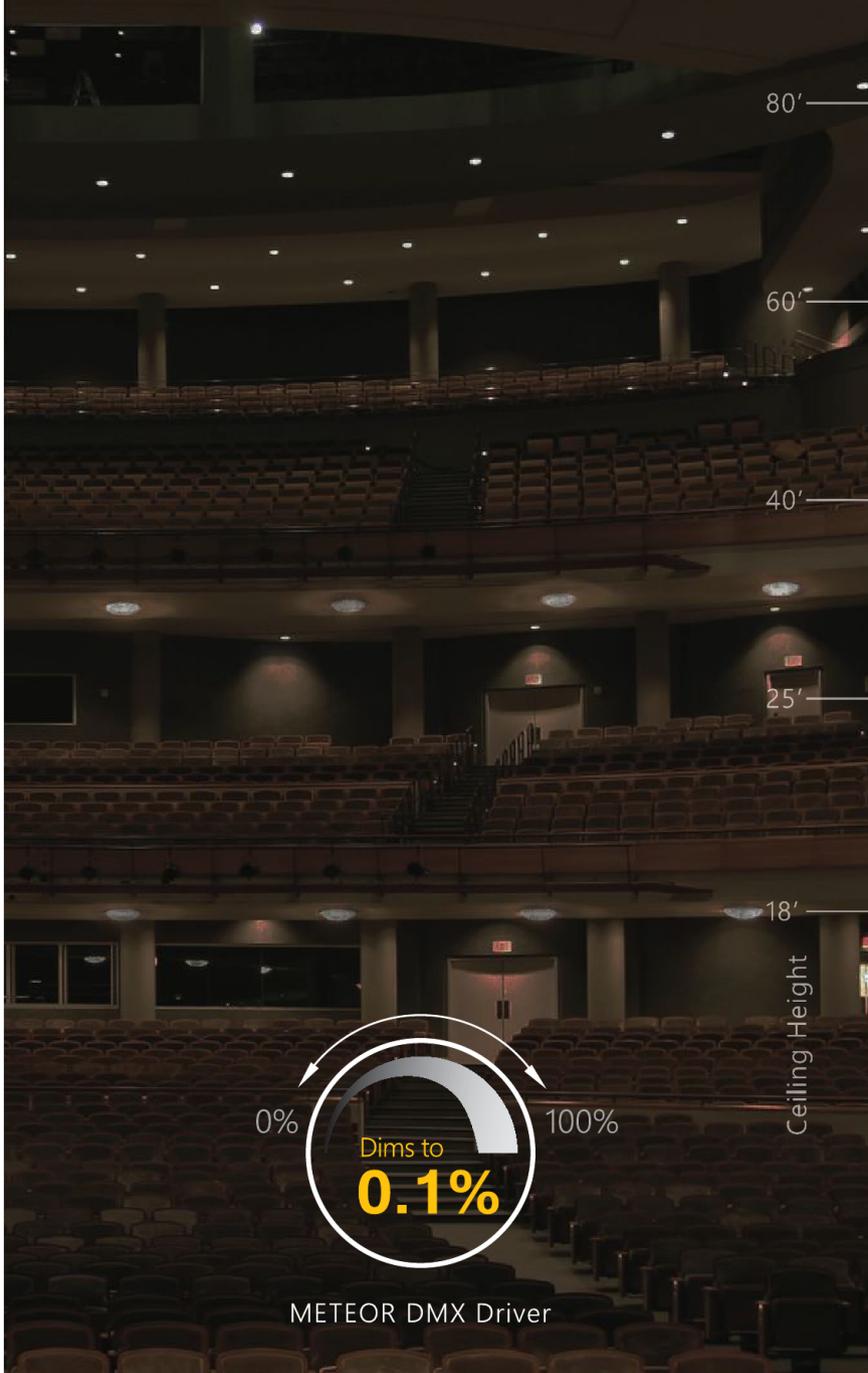
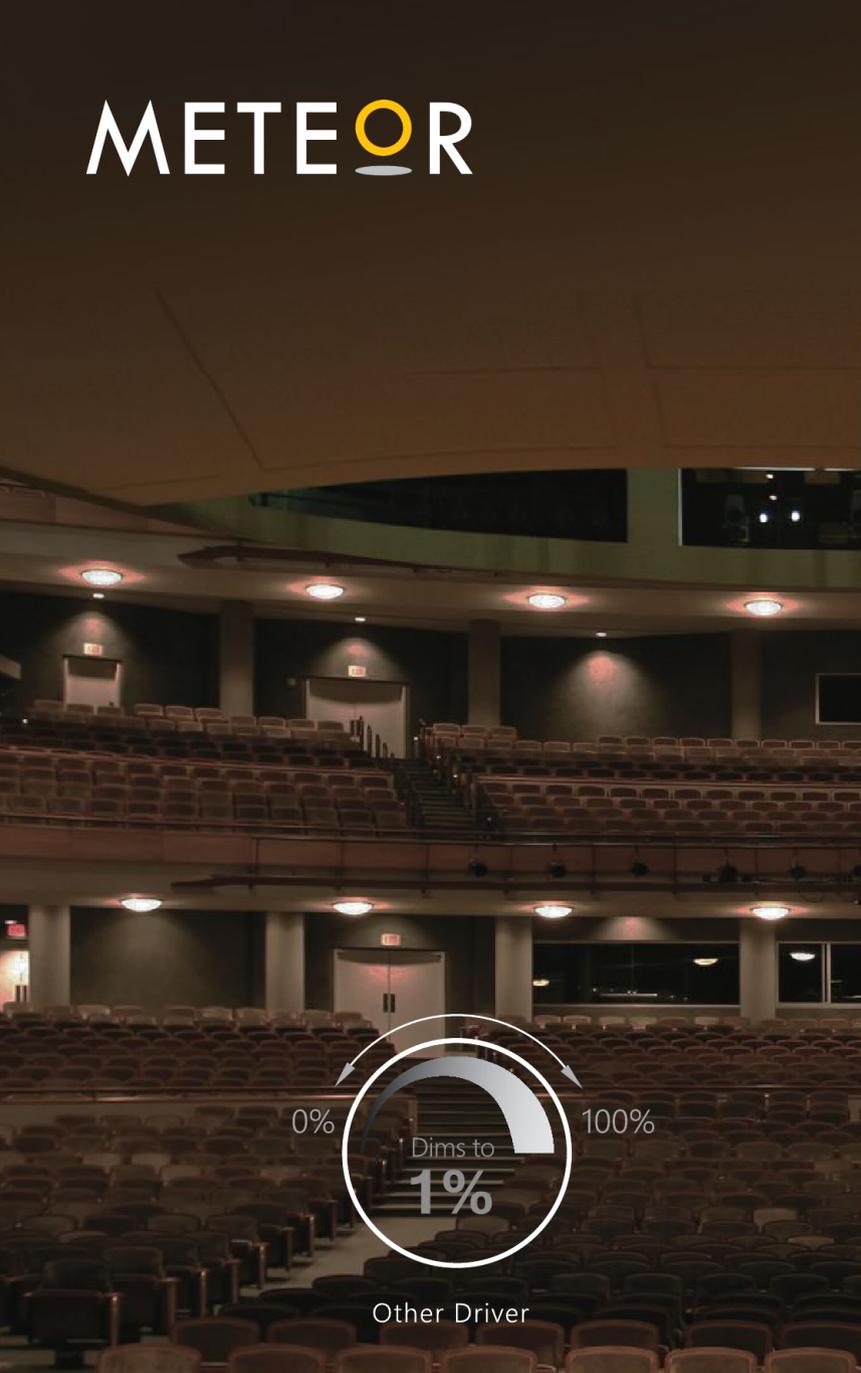


**Endurance Fin Exterior LED Luminaire, WAC Lighting** • This wall-mounted fixture delivers up to 2,825 lumens while consuming a maximum of 35W. Available in 3000K and 5000K, it provides 20-degree forward illumination and features a tempered prismatic glass diffuser to reduce glare. It is IP66-rated, and operates on 120V to 277V. Dimmable via zero-to-10V or electronic-low-voltage functionality. Bronze, graphite, and white finishes are available. A built-in level aids adjustments. • [wacighting.com](http://wacighting.com)



**Verdeon LED Roadway Luminaire, Eaton's Cooper Lighting/Streetworks** • With a range of lumen packages, this luminaire is designed to replace up to 150W high-pressure sodium fixtures in most roadway applications. Available in 3000K, 4000K, or 5700K with a CRI of 70. The fixture is UL wet-location listed, 3G vibration rated, and has an optional IP66-rated enclosure. Coated to withstand extreme weather in a range of colors. Tool-free access and a removable power door simplify maintenance. • [cooperindustries.com](http://cooperindustries.com)

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# SPECIALTY

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**Luminous Ceilings, Ceilume** • Ceilume's translucent, luminous ceiling panels have recently been approved for installation below fire sprinklers. The panels are Class-A rated for surface burning and are made of a thermoplastic material that softens, sags, and drops out of ceiling grids when exposed to heat from a fire. Light sources should be installed at least 6" above the panels. Offered in 40 styles and in dimensions of 24"-square and 24" by 48", the panels can be specified with 40% recycled content. • [ceilume.com](http://ceilume.com)

## EXIT/EMERGENCY



**Universal Edge-Lit Exit Sign, Eaton's Cooper Lighting/Sure-Lites** • A streamlined aluminum housing and high-impact acrylic panel helps this universal-mount LED sign from the company's EUX series meet the aesthetic requirements of a range of spaces. The AC-powered fixture is fitted with a nickel cadmium battery and Eagle Eye self-diagnostics. Mounting options include surface, end, ceiling, wall, and recessed. Lettering is available in red and green on a single- or double-sided lens. • [cooperindustries.com](http://cooperindustries.com)

## THEATRICAL



**Panasonic Projection Lighting Space Player, Universal Lighting Technologies** •

This 125W H-type track-mounted projector uses a 1,000-lumen solid-state laser diode to spotlight objects and project video or still images, and offers a maximum diagonal throw of 100'. Equipped with vertical, horizontal, and corner keystone correction. A compact housing, sealed optics, and filter-free design eliminates the need for cleaning. The fixture weighs 7 pounds and includes a wireless remote controller. • [unvlt.com](http://unvlt.com)

## DAYLIGHTING/SOLAR CONTROL



**SkyVault Series Collector, Solatube International** • The company is adding an amplifier to its SkyVault Series core solar tube unit and prismatic diffuser to capture more low-angle daylight and extend delivery during the low-light hours of the day. Suited for high-ceiling commercial applications with ceiling heights of at least 26', the collector intercepts light passing through the dome and directs it into the tubing. An internal reflector helps to minimize solar heat gain. • [solatube.com](http://solatube.com)

## EXIT/EMERGENCY



**EVHC High Lumen LED Emergency Light, Hubbell Lighting/Dual-Lite** •

For use in applications including offices, schools, and industrial facilities, EVHC High Lumen LED Emergency Lights can be spaced up to 83' and mounted at heights from 7' to 20'. Offered in 6W and 12W versions with optional diagnostics and two integral lamp heads that use three LEDs each. A lithium iron phosphate battery recharges within 24 hours. The fixture takes 120V to 277V AC input. In black and white finishes. • [dual-lite.com](http://dual-lite.com)

## THEATRICAL



**BPL Image Projector Series, Lighting Services Inc** •

This LED projector is designed for throws of up to 20' for black-and-white images and single and multicolored patterns. In 2700K, 3000K, 3500K, and 4000K with a CRI of either 80 or 95, the fixture provides 1,800 to 2,700 lumens. Four cool-touch framing shutters allow for geometric shapes, including true triangles. Offered with a fully rotatable barrel, self-locking zoom lens, multiple mounting options, and an integral AC driver. • [lightingservicesinc.com](http://lightingservicesinc.com)

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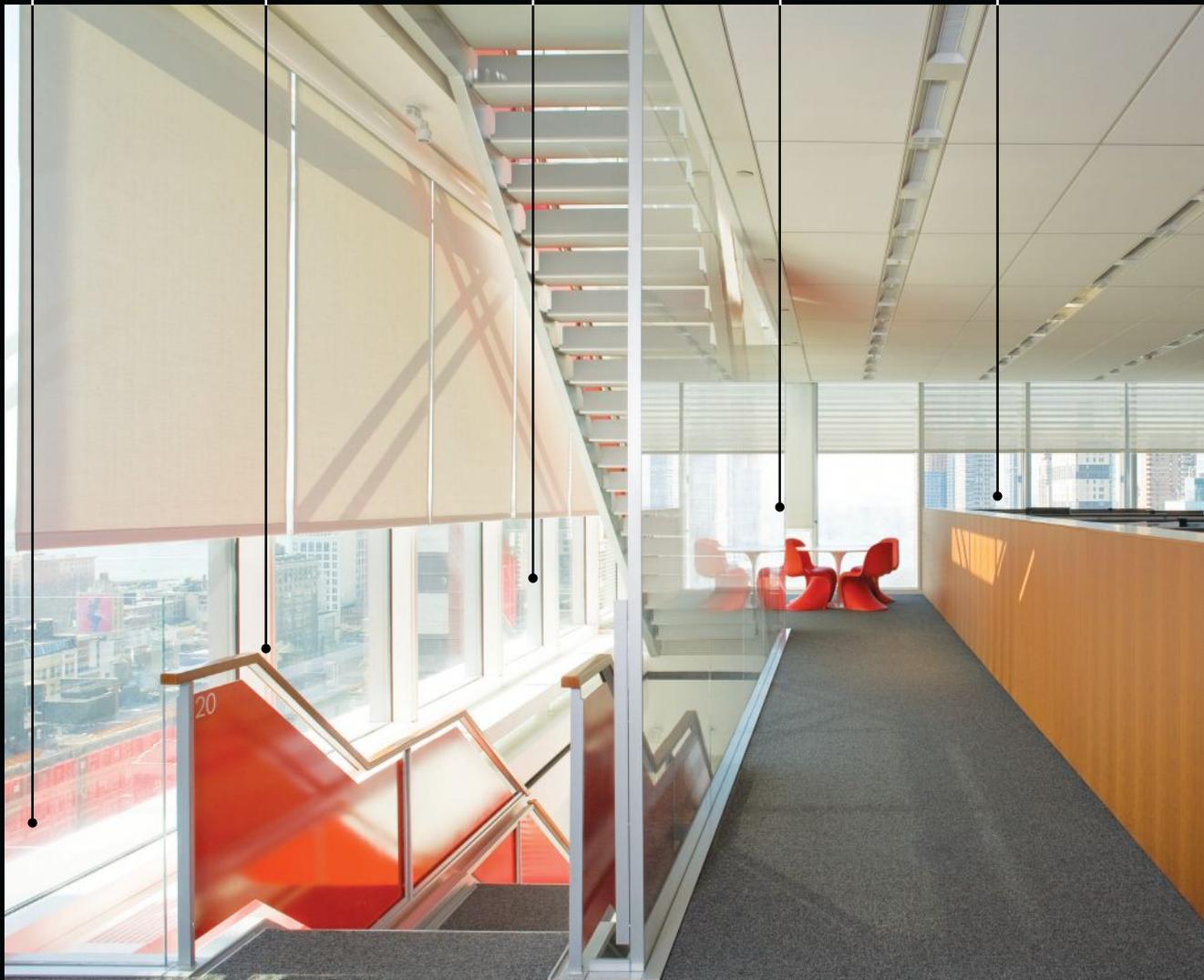
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## Tracking Magnet, Flos Architectural

Flos' Tracking Magnet offers flexibility in compact dimensions. The 48V graphite electric track accepts magnetic luminaires, freeing them from bulky power units. For indoor installation, the extruded aluminum track can be surface mounted or recessed. The system is offered in a range of dimensions, including corners, and is designed for use with the company's Anthony spotlight. • [usa.flos.com](http://usa.flos.com)



## Artima LED/5, Edison Price Lighting

The Artima LED/5 family of fixtures is designed for accent, wallwash, and narrow-beam spotlighting in high-ceiling spaces. The LED luminaire is available from 2700K to 5000K in multiple configurations and beam spreads, including a cross-baffled accent light that can provide up to 3,700 lumens at a CRI of 97 and up to 5,600 lumens at a CRI of 80, and a 5,600-lumen wallwasher that can illuminate a 16'-tall wall with an average of 26 footcandles. • [epl.com](http://epl.com)



## Cylindrix III LED, Amerlux

This high-power LED track head replaces metal halide fixtures for display lighting in high-ceiling commercial spaces. The 33W fixture delivers up to 2,431 lumens in 2700K, 3000K, 3500K, and 4000K with a CRI of 83; the 2700K and 3000K options are also available with a CRI of 97. Spot, flood, and wide flood beam spreads are offered. Dimmable, the fixtures can be track, busway, or surface-canopy mounted, tilted vertically 90 degrees, and rotated 360 degrees. • [amerlux.com](http://amerlux.com)



## LED Mini-Cylinder Spotlight Series, Juno Lighting Group

Juno Lighting Group upgraded its LED Mini-Cylinder Spotlight Series to improve lumen output without increasing power consumption by adding a 3500K option within a three-step MacAdam ellipse. The dimmable, 6W tracklight is designed to match the output of a 20W MR11 halogen. It comes in 2700K, 3000K, 3500K, or 4000K at a minimum CRI of 80, and with spot, narrow flood, and flood beam spreads. • [junolightinggroup.com](http://junolightinggroup.com)



## MX Track Accent Lighting, Intense Lighting

The MX family of accent track fixtures is offered with either a vertical or a horizontal driver housing. Each features adjustable heads and come with three beam options: a 12-degree spot, a 24-degree narrow flood, and a 36-degree flood. Each 14W fixture head provides more than 1,000 lumens and up to 77 lumens per watt. Available from 2700K to 4100K with a CRI of 82, the dimmable fixture is an alternative to 20W ceramic metal halide luminaires. • [intenselighting.com](http://intenselighting.com)



## Lumination TS Series Tracklights, GE Lighting

Designed for retail accent lighting, the TS Series of LED tracklights is offered in flood and spot versions in 2700K, 3000K, or 3500K at a CRI of 80 or 90. The flood version comes in three modules—19.5W and 1,750 lumens; 15W and 1,300 lumens; and 11W and 890 lumens—with multiple beams spreads. A 14-degree spot version comes with a 20.6W lamp that provides 1,250 lumens. The non-dimmable fixture features a die-cast machined housing. • [gelifighting.com](http://gelifighting.com)



**Chroma Z35, Bruck Lighting/Ledra Brands •**

This track-mounted LED spotlight's machined aluminum housing doubles as its heat sink and is available in black, white chrome, and white finishes. A single-source, 32W LED module provides either 1,500 or 2,200 lumens in 2700K, 3000K, 3500K, or 4000K with a CRI range between 82 and 97. Beam spreads include a 20-degree spot, 40-degree medium flood, and 60-degree flood. The track head is available in three sizes and 4<sup>5</sup>/<sub>8</sub>" and 5<sup>1</sup>/<sub>4</sub>" diameters. • [brucklighting.com](http://brucklighting.com)



**CorePro LED Mini Cylinder, Philips**

**Lightolier •** These LED track heads perform like 50W MR16 halogen luminaires but consume 82% less energy, according to the manufacturer. The fixture integrates the light source, optics, thermal management system, and driver in a single housing with a minimum profile that offers a 90-degree vertical tilt to measure up to 7" tall and with a 2<sup>1</sup>/<sub>4</sub>"-diameter fixture head. The 8.9W LED module provides 700 lumens in 2700K and 3000K with a CRI of 80 or 90, respectively. • [philips.com](http://philips.com)



**SSLGR16 Series, Lighting Services Inc •**

Designed for use with Soraa's 5W and 7.5W GU10-base MR16 LED lamps, this track-mounted, line-voltage fixture is available in beam spreads of 10, 25, 36, and 60 degrees. Manufactured from die-cast aluminum, it can be ordered with the same or contrasting front and rear hoods. Each fixture head weighs 1 pound and measures nearly 5" long by 2<sup>5</sup>/<sub>16</sub>" tall with a 2"-diameter diffuser, and accommodates a range of mounting options including custom stems. • [lightingservicesinc.com](http://lightingservicesinc.com)



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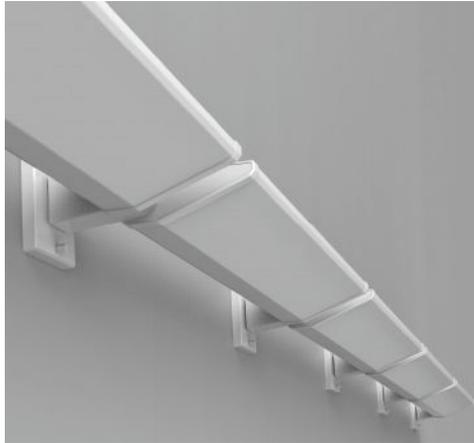
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# WALLWASHERS

Streamlined form factors and high outputs make these fixtures suitable for a range of spaces.



**Fino Ceiling, Amerlux** • This linear asymmetric wallwasher is available in 2700K, 3000K, 3500K, or 4000K with a CRI of 83 in flanged and trimless styles for use with drywall or acoustic tile ceilings. Specifiable in 6" lengths, the latch-mounted fixture has a 5/8"-deep extruded aluminum frame. The snap-in optical performance assembly features an internal asymmetric reflector. Offered at either 6W per lumen foot or 12W per lumen foot, the luminaire is zero-to-10V dimmable for 120V and 277V systems. • [amerlux.com](http://amerlux.com)



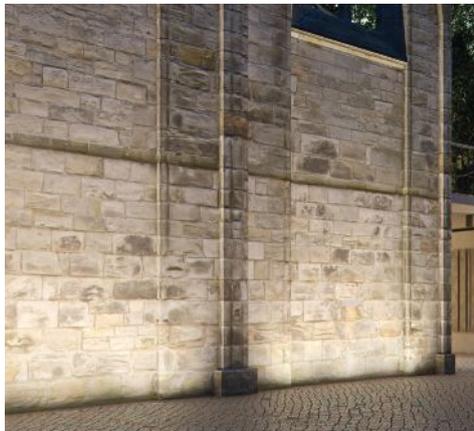
**Windirect LED, Acuity Brands/Winona Lighting** • This family of asymmetric indirect LED uplights is an alternative to ceramic metal halide or fluorescent fixtures for use indoors and outdoors. The forward-throw, shallow-angle luminaires offer uniform distribution and come in four profiles with outputs from 1,030 to 19,634 lumens and with a CRI of 83. Zero-to-10V dimmable. Mounting options include wall, ceiling, pendant, and basemount. • [winonalighting.acuitybrands.com](http://winonalighting.acuitybrands.com)



**DecoLED, Insight Lighting** • For uplighting large interior spaces, this wall-mounted indirect LED luminaire provides 7,193 or 24,069 lumens while consuming 120W and 300W, respectively, in 3000K, 3500K, or 4000K. Two housing styles are offered, each constructed of cold-rolled steel with a powdercoated finish and a clear acrylic lens. Dimmable via integral 120V or 277V standard or zero-to-10V controls. Finishes include white, black, natural, bronze, satin semi-gloss, or custom colors. • [insightlighting.com](http://insightlighting.com)



**Running Magnet Wall Washer, Flos Architectural** • This asymmetric LED wallwasher module is designed for recessed ceiling applications. Designed to illuminate vertical walls, the fixture is available in 3000K with a CRI of 80. The spotlights offer beam angles of 20, 28, and 37 degrees as well as a 45-degree-by-15-degree elliptical beam. Offered in various lengths, the fixture's field-cuttable extruded aluminum structural tracks can be finished in black or white. • [usa.flos.com](http://usa.flos.com)



**Site In-Ground Luminaire, Erco** • Designed to be situated up to 11.8" from the surface it is illuminating, this 24W in-ground LED wall grazer offers linear asymmetrical light in 3000K or 4000K while providing 2,400 or 3,180 lumens, respectively. The LED module can be tilted up to 10 degrees in two directions and is fitted with an internal optical polymer lens. The phase-dimmable fixture measures 17.5" long and 4.75" wide with 3/8" clear safety glass, and it has a black-plastic IP68-rated recessed housing. • [erco.com](http://erco.com)



**CLM Series LED, Engineered Lighting Products** • For use in small coves or wall mounted, this fixture is available in 2', 3', 4', and 8' lengths, fitted with either a clear or a frosted polycarbonate lens. Available in 3500K with a CRI of 80-plus, the luminaire can also be specified in 2700K, 3000K, and 4000K. Its single-piece formed reflector is powdercoated white and allows tool-less access to the 120V-to-277V drivers and wiring channel. Dimming options include zero-to-10V, two-wire, or three-wire. • [elplighting.com](http://elplighting.com)



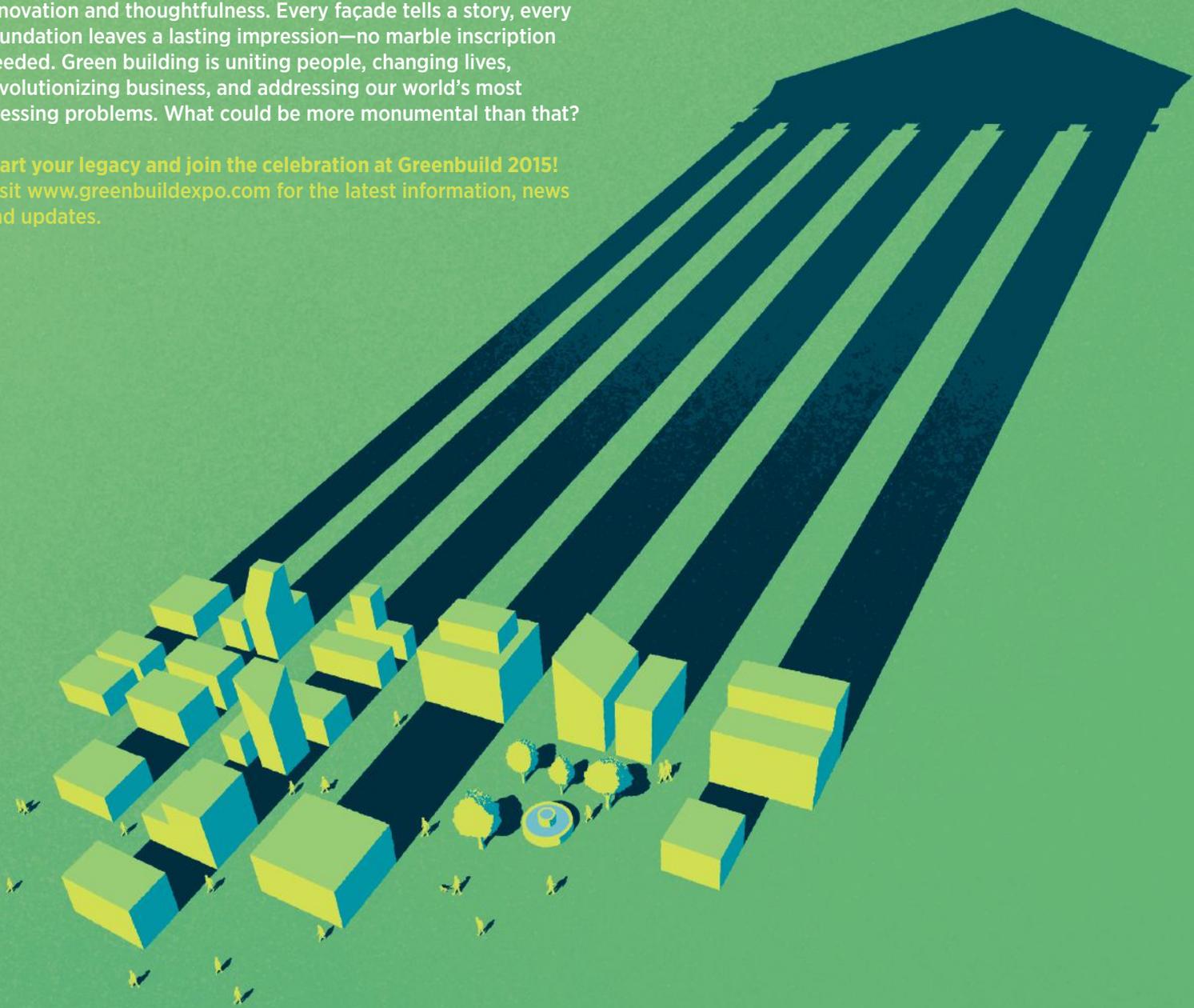
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## ● WALLWASHERS



**MicroCove, Prudential Lighting** • Providing up to 1,080 lumens per foot and specifiable in 1' increments, this linear LED cove and wallwash luminaire is available in 2700K, 3000K, or 3500K, and with a CRI of 84 in 4000K. Constructed of extruded aluminum with an extruded acrylic lens, the fixture measures 5¾" deep and 2¾" tall. The lens optics offer a peak angle of 105 degrees and up to 30 degrees of tilt for vaulted coves. Dimming includes zero-to-10V or DALI controls. • [prulite.com](http://prulite.com)



**Wall Wash Bi-ax, Elco Lighting** • This track-mounted, dual-bi-ax compact fluorescent wallwasher includes an aluminum reflector with a parabolic louver for glare control. Its housing is constructed of extruded aluminum with no exposed fasteners and measures 17½" long and 8¼" tall. A heavy-duty mounting bracket allows for aiming with a single adjustment knob. Fitted with an integral electronic ballast, the fixture provides 2,500 or 3,600 lumens. Finishes include white or black. • [elcolighting.com](http://elcolighting.com)



**Leesti Adjustable Trimless, Archlit** • This ceiling recessed trimless linear luminaire is available in 1', 2', 3', or 4' runs. Its lens features a diffusing film to create a continuous line of light. Drawing 12.5W per lumen foot, the fixture produces up to 1,400 lumens per foot in 3000K. Available for 120V or 277V inputs and dimmable using TRIAC or zero-to-10V controls, depending on the model. Powdercoat finishes include black, white, and custom colors. Damp location listed. • [archlit.com](http://archlit.com)

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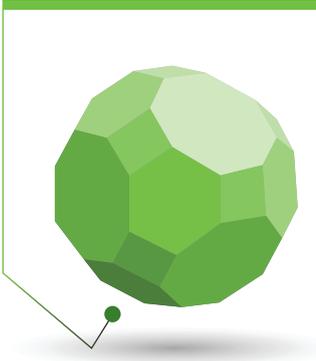
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## CIRCUMVENTING OBSOLESCENCE

*Coordinating the specification process with evolving lighting technology options.*

text by Hallie Busta

The ongoing evolution of LEDs has upended the traditional specification process, making it difficult for designers to know whether the luminaires they spec today will be available in a few months, whether the manufacturer will still be in business, or even whether the product's performance will be competitive with new offerings available when the project is completed. Given these constraints, how should designers and manufacturers specify luminaires today?

Manufacturers suggest that designers keep their specs loose and stay in communication with the company. "An overly rigid specification could actually limit the ability of the customer to install the best technology," says Jerry Duffy, GE Lighting's global product general manager. (Manufacturers also should be notifying designers about items that might impact product changes and availability.)

Concerns vary by product category. For example, when specifying decorative luminaires, designers often want to know whether the exact

fixture will be available, but for applications that can handle more flexibility when it comes to fixture selection, "the concern is more about making sure delivered light, distribution, and other control options match the original specification," says Antonio Giacobbe, a commercial engineer at Osram Sylvania.

Lance Bennett, vice president of specification sales at Eaton's Cooper Lighting, says the company and its brands aim to keep form factors consistent through performance upgrades to ease integration woes. And Duffy recommends specifying core product types, such as troffers, that will be continually upgraded rather than phased out. The biggest issue, however, is making sure fixtures specified today can be used with increasingly sophisticated lighting controls.

Technological changes are keeping the lighting industry on its toes, and manufacturers must keep lighting designers informed about short- and long-term changes that may effect their specifications. •

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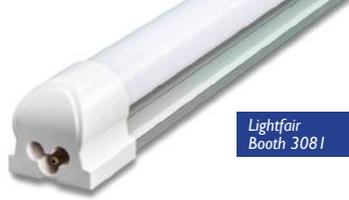
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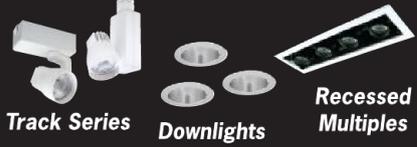


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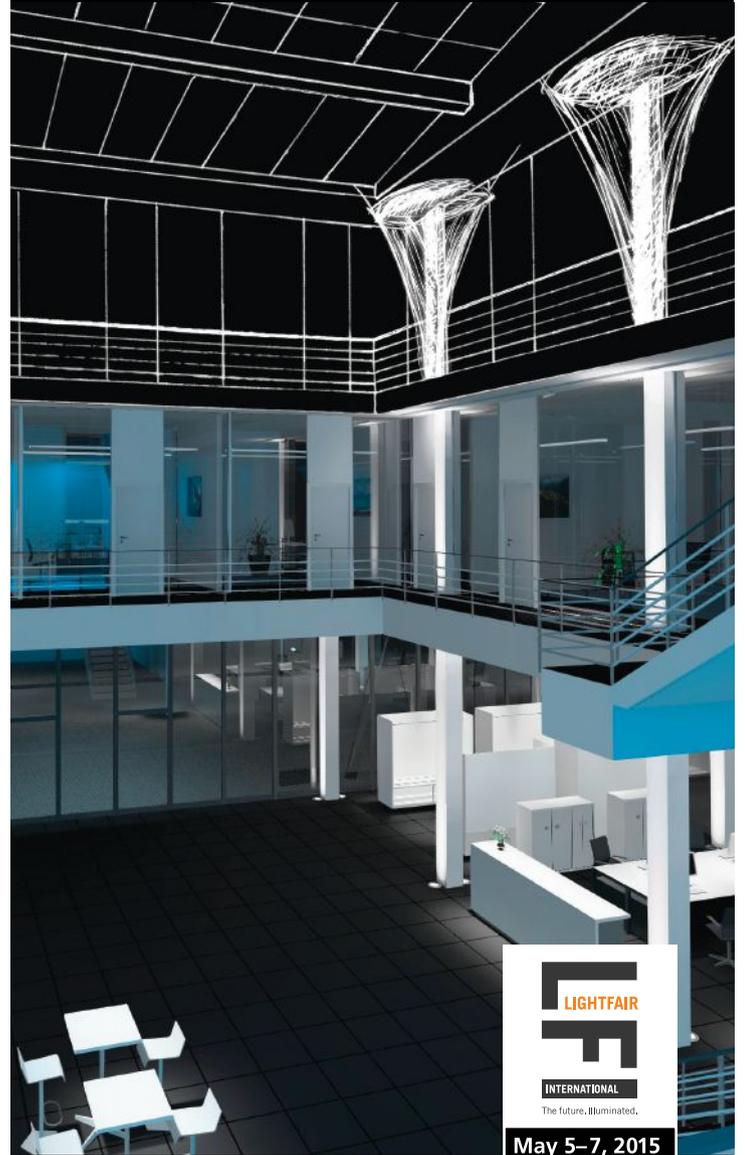
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# Ron Schimmelpfenning

interview by Elizabeth Donoff

photo by Harold Daniels

**“The important foundation for a successful business comes down to one word: service. It has to be part of the company culture so that you can build relationships with others in the industry that are respectful for what each party brings to the table.”**

**After more than** three decades in lighting, Ron Schimmelpfenning occupies a rare space in the industry between the worlds of design and manufacturing. He got his start working for Appleton Lamplighter while still in high school, helping with the drawings and fabrication of a canopy being installed at a new hotel in his hometown of Appleton, Wis. Let’s now jump ahead to 1995, when he was asked to join Winona Lighting. There, he carved out a career working with lighting designers across the country, creating custom luminaire solutions. In 2010, Winona was acquired by Acuity Brands. Schimmelpfenning now leads all of the R&D teams at Acuity, bringing his unique skill set and technical capabilities to developing the next generation of custom lighting solutions.

## **What fascinates you about light?**

I love the fabrication that’s involved, and going about creating new lighting effects that solve a particular design challenge.

## **Do you have a lighting philosophy?**

I would never design something that I can’t build myself, because I don’t ever want to promise a design that cannot be accomplished.

## **What, in your mind, makes a great piece of lighting equipment?**

Simple designs that can enhance the experience of the space. Often, we get tied up making fixtures too complicated. Nevertheless, simple doesn’t mean it’s easy. Achieving something that appears simple can be very hard to do.

## **In terms of luminaires, what’s the difference between custom and modified?**

Custom usually entails the need for a special lighting effect or an issue of size variance. With modification, there’s some aspect of an existing fixture that doesn’t resonate with the space, so you need to adjust a specific component.

## **What do you consider innovative in lighting?**

True innovation is creating new light sources and forms of illumination, such as the LED. The rest of us are then tasked with repackaging certain technologies in innovative ways.

## **How has the business of lighting changed since you first started working in the industry?**

Speed. No one—designer or manufacturer—has the same lead time they once had. A project cycle is so much shorter than it used to be.

## **What’s the next advance you’d like to see the lighting industry take?**

More focus on quality of light and stabilization of correlated color temperature. It’s something we’ve been battling for years. •



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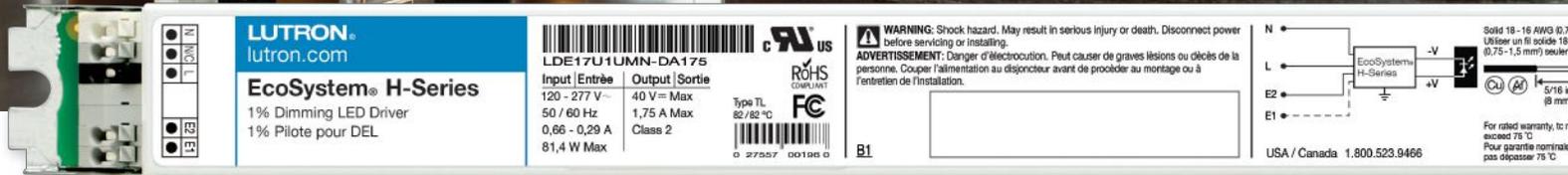
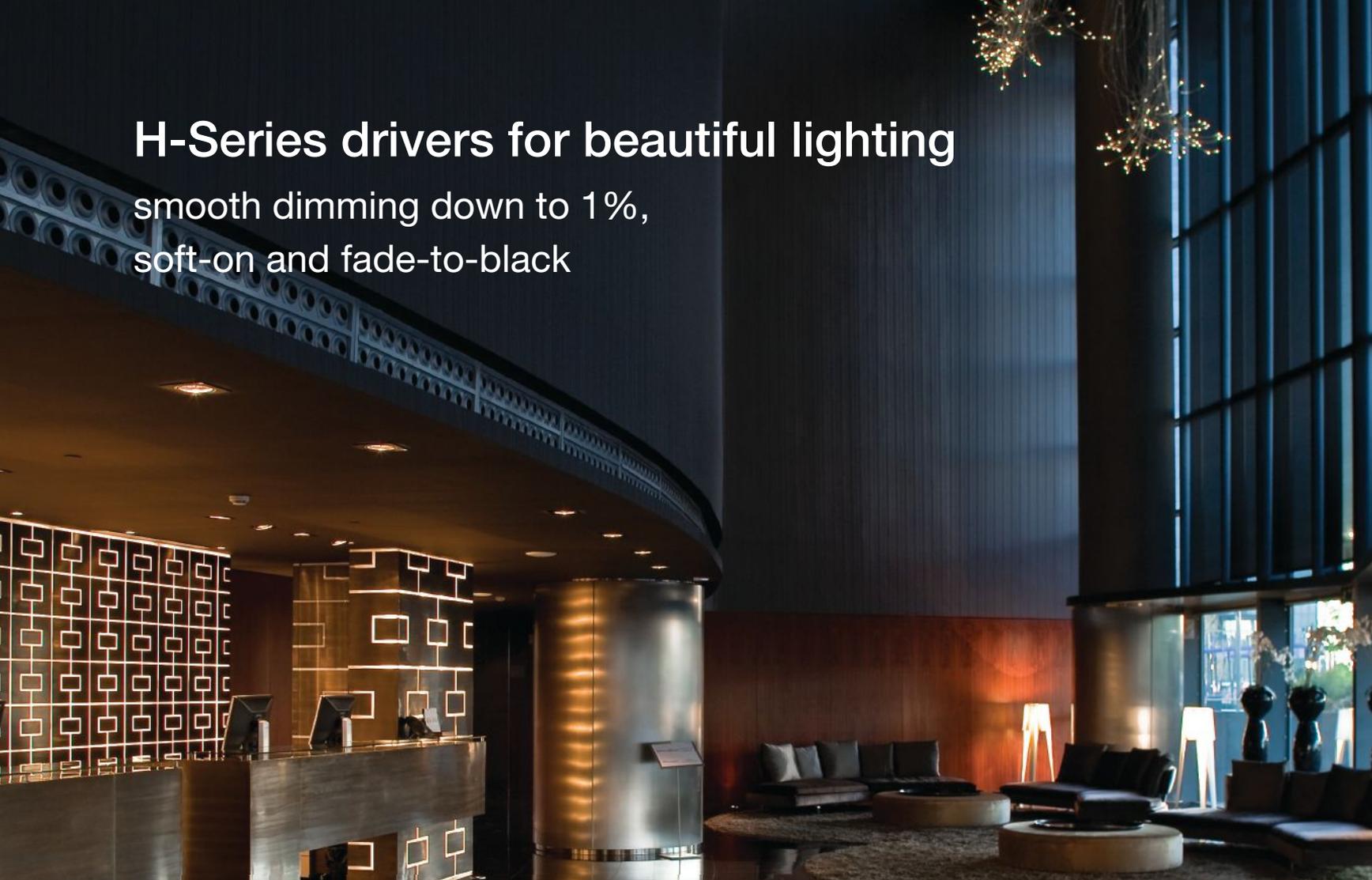
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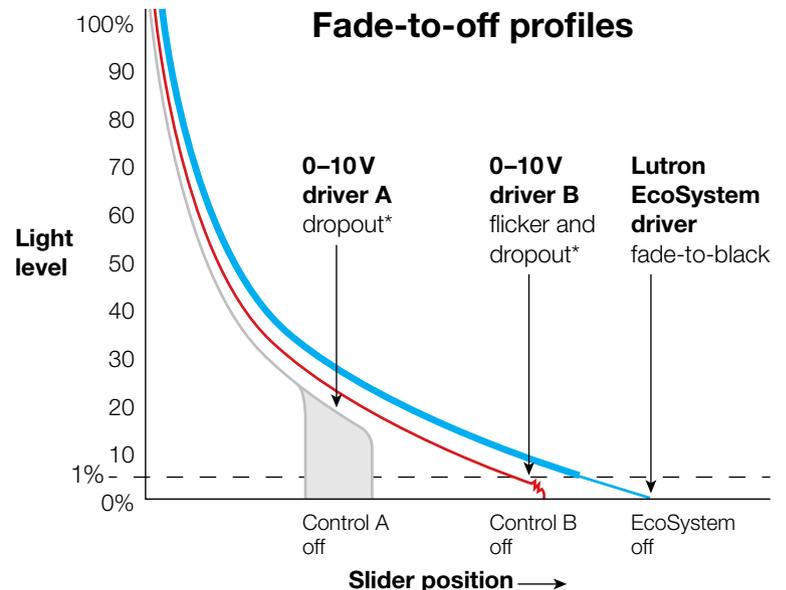
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