

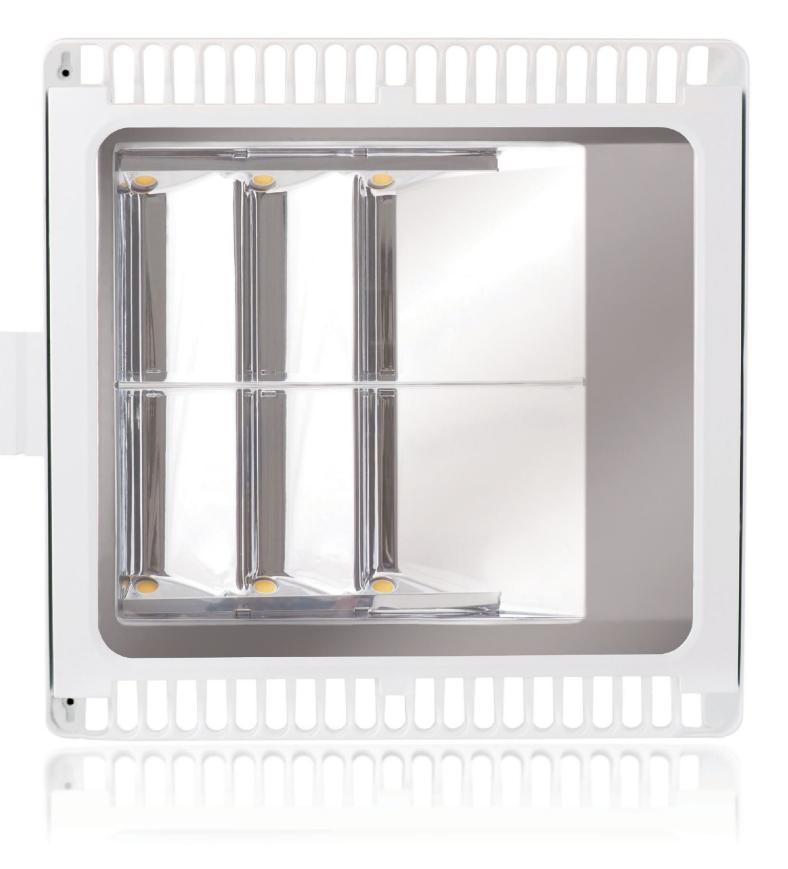
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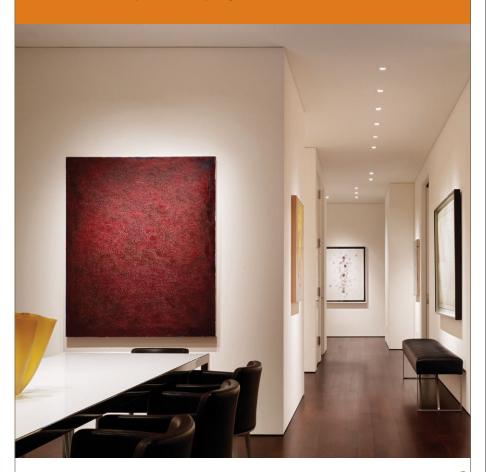
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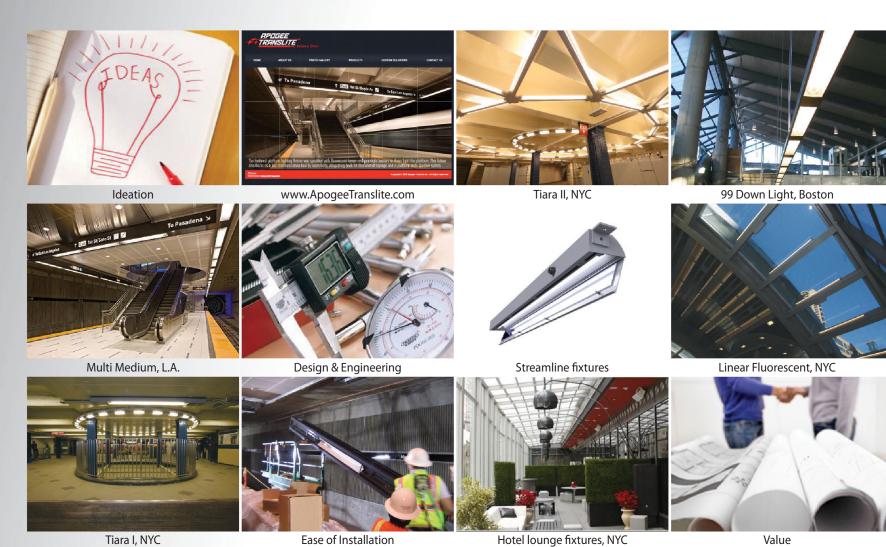
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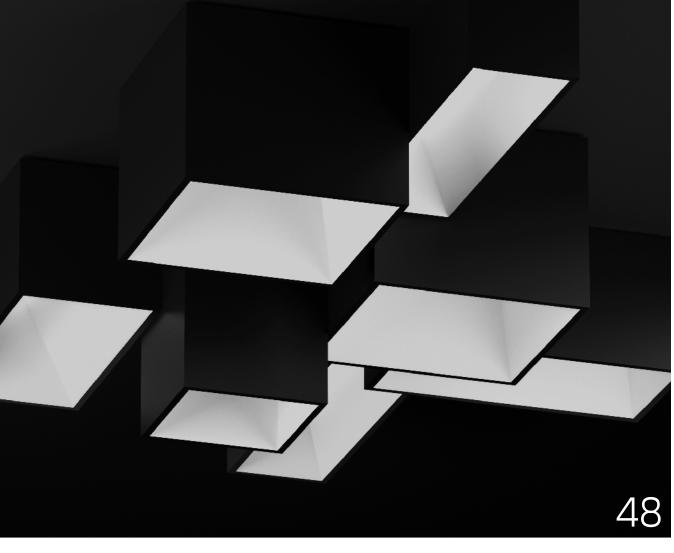
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# "Today, and in the future, it has to be about new research, new manufacturing, new light."

# THE LIGHTING MANUFACTURER'S DILEMMA

Lights. Lamps. Fixtures. Luminaires. Lighting Products. These are a few of the many terms used to refer to the luminous objects that line our ceilings, walls, floors, and landscapes. But no matter how you refer to these illuminated entities, the core question is: What's the

and landscapes. But no matter how you refer to these illuminated entities, the core question is: What's the starting point for good luminaire design? Is it the source itself or the application? Or is it something else entirely?

I posed this question to ARCHITECTURAL LIGHTING'S

I posed this question to architectural lighting's Twitter audience on April 5, following a late night where I was making one of the last passes through the more than 200 product submissions that we received for this annual product issue. I asked the question because, as I worked my way through all of the submissions, I was surprised, quite frankly, by a surprising dearth of beauty. I couldn't help but wonder: Are LEDs contributing to this aesthetic deficiency? The new generation of LED fixtures are some of the worst offenders, particularly when it comes to street lighting.

LED sources have different characteristics and properties, as well as different light distributions. Manufacturers have embraced the challenge of working with solid-state lighting, but not all have found the right comfort level when it comes to translating that enthusiasm to luminaire design. This is cause for some concern since the current generation of lighting infrastructure is now being switched over to luminaires that are not necessarily providing a better-quality lighting solution. Just as we critique the yellowish glow of high-pressure sodium lamps that now dot our streets, will future generations berate us for the bright, harsh glare of white-light LED fixtures that lack optical treatments and shielding devices?

The diversity of product quality, in terms of design and technical performance, is striking. Along with all of the products that appear in this issue, there is, to put it quite bluntly, a lot of crap that we chose to leave out, due to poor aesthetic decisions and material selections, and unsubstantiated product claims. A reputable lighting manufacturer once told me that there are different classes of products, and not everyone can afford the top-of-the-line offerings. Still, no matter the price point, shouldn't you be able to count on quality? Otherwise, does it make sense to spend valuable project dollars on inferior product selections?

Lest you think I am being too harsh on lighting manufacturers, I would like to point out that I do sympathize with the challenges that they face. They must continue to innovate while protecting their legacy product lines and watching their bottom line. They face many unknowns: How will LEDs transform the manufacturing of lighting products? What will the lighting company of the future look like? What innovative business models and practices will be required? What type of employee will be desired and

what new skill sets will he or she need? How should we factor in obsolescence when designing light fixtures?

Perhaps the greatest challenge that manufacturers face is figuring out a way to invest in research and product development while still running a profitable business. Once upon a time, lighting companies were looked to as the driving force behind industry innovations. Places such as GE's Nela Park in Ohio led the way in the developments that contributed to fluorescent technology and they aided in the birth of the modern lighting industry. You don't hear about those types of research centers anymore.

Today, market competition is so great that manufacturers must be extremely cautious about what they share and what they do not, rightly fearing that their ideas and technologies could be stolen. But what if there was a central lighting-research consortium where new technological developments could be explored and shared freely for the greater good of everyone in the lighting community? It might follow the example that Clayton Christensen outlines in his book *The Innovator's Dilemma*, where companies set up separate research subsidiaries that are free of market constraints in order to deal with disruptive technologies. This allows manufacturers to spend the time and resources to innovate without jeopardizing day-to-day business.

Despite my dismay at the ugliness proliferating in light fixtures, there is hope. As I finish writing this, I have just spent six days at Light + Building in Frankfurt. I've seen a lot of products, and certainly a share of them have been ugly. But as I stopped to speak with manufacturers, I found that they are working extremely hard to figure out how to embrace LED technology in a market-viable way. I hope to hear the same thing when I go to Lightfair in May.

Slowly emerging are luminaires that integrate sophisticated optical control. And many companies have made major behind-the-scenes capital investments to retrain employees, buy new equipment, and restructure product and production lines to meet the specific requirements of making LED fixtures. Strangely though, lighting companies don't publicize this. But they should.

Now, more than ever, it is not enough to apply new technology to old processes. Today, and in the future, it has to be about new research, new manufacturing, new light. As one of AL's Twitter followers responded to my question about luminaire design, "Design well and you have both function and form."

Elizabeth Donoff Editor





# clean lines

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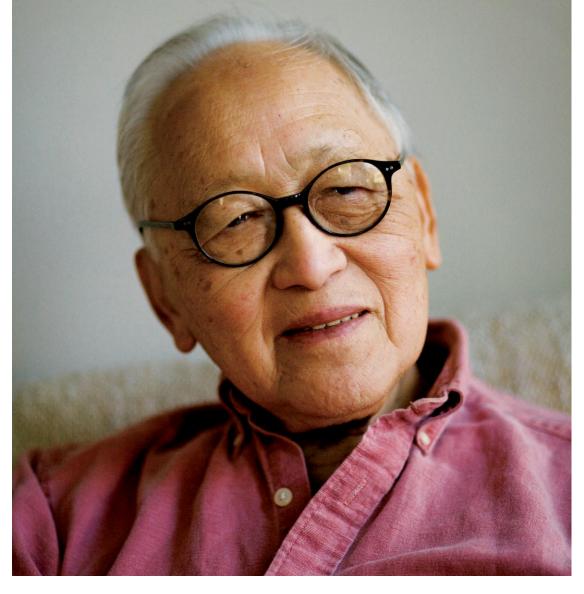
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# **WILLIAM LAM** 1924-2012

The lighting community loses one of its visionaries.

text by Elizabeth Donoff

A true pioneer of architectural lighting, both in terms of project and luminaire design, William Lam, 87, died on April 6 at his home in Cambridge, Mass. His lighting accomplishments are numerous, including an Institute Honor for Collaborative Achievement from the American Institute of Architects in 2000. And yet, many architects and lighting practitioners do not realize the debt they owe to Lam. The causes he championed include lighting at the start of the design process, and the integration of lighting, daylighting, and building systems long before such an approach was the norm.

Lam was born in Honolulu in 1924 and moved to Cambridge, Mass., in 1941 to attend the Massachusetts Institute of Technology (MIT). His studies were interrupted by World War II, during which he served in the Army Air Corps as a B-25 co-pilot. After the war, he returned to MIT and received a bachelor's degree in architecture in 1949. Lam was influenced by the work of Finnish architect Alvar Aalto-who had designed MIT's Baker House in 1946 and taught at MIT while Lam was a student.

His first foray into design was the creation of a gooseneck floor lamp with a clip-on diffuser shade. Friends asked where they could get one, so Lam set up his own studio-Lam Workshop, which became Lam Inc. in 1951. The company manufactured architectural

lighting fixtures, and still does today as a division of Philips Lighting.

In 1959, Lam focused his energies on projects and established William Lam Associates to serve as a lighting consultant to architects. Some of the notable projects he worked on include the Washington, D.C., Metro and the San Diego Convention Center. He advocated for what became his slogan, "lighting by design, not engineering," and was instrumental in drafting standards and guidelines such as "An Approach to the Design of the Luminous Environment" in 1976 for the State University Construction Fund of New York. In 1980, his firm became Lam Partners as his associates assumed greater day-to-day responsibilities. Although he retired to more of a project-consulting role in 1995, Lam remained engaged with lighting issues up until his death.

His books Perception and Lighting as Formgivers for Architecture (1977) and Sunlighting as Formgiver for Architecture (1986) have become seminal reference books for both architects and lighting designers. Although out of print, Lam provided access to the texts when he created a website (wmclam.com) in 2008. A Living Legend member of AL's 2001 Hall of Fame, he noted in the article in the March 2001 issue. "I think that I've helped to lay the foundation for my profession, and that's a good feeling." •

# **SIGNS AND SYMBOLS**

LED monufacturer Cree holds a workshop to create a new lighting iconography.

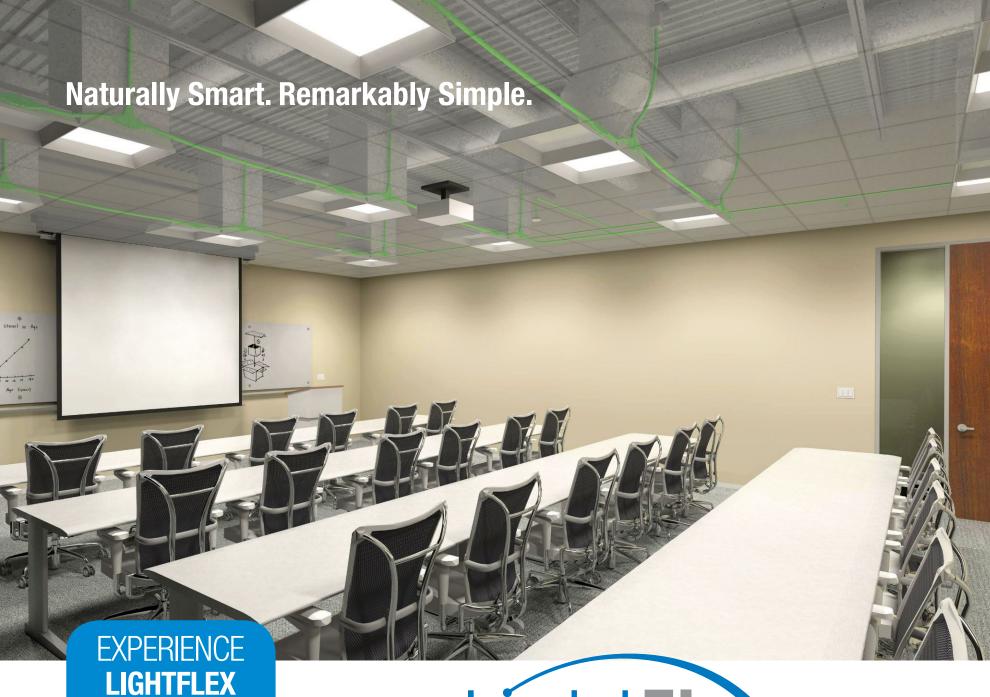
text by Elizabeth Donoff

The light bulb has become a ubiquitous iconographic symbol representing more than just lighting. But as contemporary discussions grapple with issues pertaining to energy efficiency and related lighting technologies, a new singular symbol has not arisen that expertly captures and conveys this idea. Although the compact fluorescent light bulb (CFL) has often been used, it is a poor substitute when it comes to representing the range of available energy-efficient lighting options, including solid-state lighting.

But that is about to change, if LED manufacturer Cree has its way. In an effort to create a universal symbol specifically for LED lighting, which in the company's mind is also a way to represent energyefficient lighting, Cree partnered with the Noun Project—a free, online visual dictionary of symbols for energy-efficiency developments—to host an Iconathon. Forty participants, including graphic designers and anyone else interested in lighting and energy topics, assembled on Feb. 25 at Cree's Durham, N.C., headquarters to partake in the one-day workshop, led by Edward Boatman, one of the Noun Project's founders. Attendees split into groups to sketch and brainstorm ideas. At the end of the day, the group critiqued 15 proposed symbols and reviewed more

"There were two basic design perspectives that emerged," explains Ginny Skalski, Cree's social media were those who felt it was essential that the LED light symbol take on the same characteristics of a traditional light bulb or CFL. Then there were those who felt that the symbol for LED light should not be constrained to the light-bulb form because LEDs are so versatile." After lengthy discussion, the group reached a consensus that the new symbol should depart from the light bulb form and focus on the LED itself. The new symbol, a representational square and light beam, was released on April 18 along with the full suite of energy-efficiency symbols, which are all available for download at the noun project.com. •

14



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REPORT

# CREDENTIAL POTENTIAL

Architectural lighting design's practitioner organizations hope that a professional certification will distinguish qualified designers and validate their profession.

text by Jeffrey Lee illustration by James Provost Credentialing for architectural lighting designers has stirred ongoing discussions among industry professionals for the past four decades. In fact, the subject was part of the initial set of agenda issues that the original founders of the International Association of Lighting Designers (IALD) included in their discussions as they worked to establish a professional lighting organization in 1969. Today, the subject is once again the topic of discussion, and the IALD has now developed a more tangible framework for those conversations by presenting an outline of how a formal certification process might work.

While the IALD has considered credentialing several times before, it began a renewed effort two years ago, when the board of directors discussed the topic and learned more from a credentialing expert at a strategic planning meeting. The investigation of a credential was spurred in part by a piece of legislation proposed in 2009, Texas House Bill 2649 (HB 2649), which initially included language that would have restricted the practice of

lighting design to architects, engineers, and electricians. (The bill was subsequently passed after the problematic language was removed.) "That was a big wake-up call for us," says Kevin Theobald, current president of the IALD and principal of London-based Kevin Theobald Lighting Design. "As an organization that represents lighting designers, we were concerned that policymakers were making decisions on our behalf because there isn't a validated benchmark for being a practitioner. Our mission is to raise the profile of the profession, so it seemed like a logical thing for us to look at the possibility of organizing an international credential for lighting design."

In 2010, the IALD board launched an international task force to study the feasibility of a certification, under the leadership of lighting designer and IALD member David Becker, director of lighting design firm Point of View in Sydney. "He has a good understanding ... [of the industry's politics] and of the profession globally, and asks the right questions." Theobald says. "He's not someone who would just push things through."



"At this point in time, somebody who knows nothing about lighting can call themselves a lighting designer in the same way as somebody who's very talented, and there needs to be some way of differentiating."

 David Becker, IALD credentialing task force chair and director of lighting design firm Point of View in Sydney

After the initial setup of the task force, which currently includes eight lighting designers, the IALD also invited participation from other lighting-design organizations, including the Professional Lighting Designers' Association (PLDA), the National Council on Qualifications for the Lighting Professions (NCQLP), and, representing lighting manufacturers, the Lighting Industry Resource Council (LIRC). "This isn't just for IALD members," Theobald says. "It's for all professional lighting designers."

After an initial job-task analysis led to a rough model of the certification, the task force gathered feedback and used that guidance to create a more extensive prototype certification model. In March, they launched a webinar series and a questionnaire based heavily on the prototype to gather additional feedback that will be used to further refine the model. The questionnaire, which was set to close on April 27, had received more than 600 responses as of press time. The task force plans to make a recommendation in August to the IALD's board of directors on whether or not to proceed with development of the certification. If approved, implementing a certification might take about 12 to 18 months, Becker says.

#### **Common Cause**

Defining the profession through a certification program, created through established certification-industry standards, would reduce the chances of government bodies imposing regulations or restrictions on lighting designers, Becker says. "A profession that has already defined itself through the rigor of a certification process can speak more authoritatively as a unified group."

A credential could also help to elevate and validate the profession. "This is coming from demand both from inside the industry and from [clients]," Becker says. "Good designers are fed up with not having a mark to set them apart, and [clients] want to be able to measure excellence in ability."

A certification could have a number of other benefits for the lighting design profession, says Judith Hale, a certification expert and psychometric consultant to the credentialing task force, and principal of Downers Grove, Ill.–based Hale Associates. Crafting language to define the profession might help government agencies list architectural lighting design as a profession, making it easier for designers to bid on projects. It would also provide curriculum guidance to academic institutions, which would want their programs to be aligned with the industry's certification core competencies.

Lighting designers' support for a certification instrument has recently grown, Becker says, though the idea met with some initial resistance when the task force began its work 18 months ago. He thinks that part of that resistance was rooted in a misunderstanding of what the task force was proposing. Credentialing is an umbrella term that can cover anything from academic degrees to voluntary certification to state-mandated licensure. "I think people thought that a credential automatically meant that it was a license, that you need a license to practice, and therefore people felt that their livelihood might be under threat," Becker says.

The credentialing task force is proposing a voluntary certification, which would allow designers to distinguish themselves in the marketplace, but would not affect entry into the profession. The task force has no intention of pursuing licensure, Becker says. Because licensure restricts employment, it's generally set at minimum standards focusing specifically on safety issues. Certification will be "significantly more meaningful," he says, because it will be based on a higher level of standards.

Certification is also different from membership in an organization. "Professional membership demonstrates that you have a commitment to the profession," Becker says. "A certification demonstrates competency in the field against predetermined criteria." IALD membership would still offer validation to designers who practice independent lighting design—free of influence from manufacturers or supply chains—so a combination of IALD membership and certification to assess competence would be valuable to lighting designers, Becker notes

While some experienced designers have argued that they don't need a certification because their portfolio speaks for itself, Becker thinks that the lighting design industry must plan for newcomers with smaller portfolios. "It's more difficult for somebody who's emerging, somebody with five years' experience," he says. "At this point in time, somebody who knows nothing about lighting can call themselves a lighting designer in the same way as somebody who's very talented, and there needs to be some way of differentiating."

## $Prototype\ Proposal$

While the task force still has plenty of work to do in refining the certification and the governance structure, the general outlines are taking shape. The development and administration would be overseen by a governing body, independent from any existing lighting-design association but likely administrated by IALD staff until it becomes financially viable on its own. The body would also include representatives from a range of lighting-related associations.

Unlike the NCQLP's Lighting Certified (LC) certification, the architectural-lighting-design certification would not be based on a test or exam. Designers would submit a portfolio of their work to be judged by subject-matter experts against seven "domains of practice," a set of core competencies that describe architectural lighting design. Applicants would need to demonstrate that they have achieved the objectives of the domains through a written response, as well as through evidence such as submitted exhibits, photographs, working drawings, and models. A panel of reviewers would evaluate the application using a set of criteria based on the domains (the reviewer-selection process is still being determined). The certification would expire after a given time, though the recertification process is still being formulated.

Because creativity and ingenuity are such an important part of lighting design, the task force wanted to avoid a prescriptive knowledge test or problemsolving examination. "The judging of these questions is





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### IALD Credentialing Task Force:

- David Becker, Task Force Chair, Point of View, Sydney
- Rosemarie Allaire, Rosemarie Allaire Lighting Design, Dana Point, Calif.
- Patrick Gallegos, Gallegos Lighting, Benicia, Calif.
- Barbara Cianci Horton, Horton Lees Brogden Lighting Design, New York
- Victor Palacio, Ideas en Luz, Tlalnepantla, Mexico
- Charles Thompson, Archillume Lighting Design Inc., Austin. Texas.
- David Ghatan, C.M. Kling & Associates, Alexandria, Va.
- Glenn Shrum, PLDA Representative, FLUX Studio, Baltimore

not so much, 'Yes, they've got it right,' or, 'No, they've got it wrong,'" Becker says. "It's whether the applicant can demonstrate in sufficient detail and depth that they have met the objectives of each of the domains."

The proposed certification application does bear some similarities to the application for professional membership in the IALD. But while both are based on a portfolio review, the certification application will be assessed against predetermined criteria, making it less objective and more rigorous than an IALD membership application, Becker says.

#### Digging to the Core

Distilling the core skills of a lighting designer into the seven domains—goals and outcomes, collaboration, ingenuity, synthesis, science, stewardship, and the human experience—was a demanding task, Becker notes, especially because it's an evolving field and there's no one unifying course or program that delivers someone to the lighting industry. Individuals who work for companies or organizations in other areas of lighting, such as government employees, sales representatives, or electrical contractors, may, in theory, be able to apply for the credential if they have a lighting design portfolio, but the eligibility requirements are still being formulated. One proposal, for instance, would require applicants to have been a designer at a senior level for a predefined number of years.

To make the credential both broad and flexible enough to be recognized globally, the task force is ensuring that the questionnaire gathers feedback from lighting designers and organizations around the world. "We don't know exactly how things work in every country of the world," Theobald says. "It may well be that there are things that we haven't yet identified that will come back in the survey."

The domains of practice embody core competencies

that are common to architectural lighting designers worldwide. "Most designers that I know work all over the world," Becker says. "What we do is remarkably similar no matter where we come from and no matter where we're practicing." And because they are voluntary, certification programs can be more flexible as they serve multiple international audiences, he adds.

## Planning Ahead

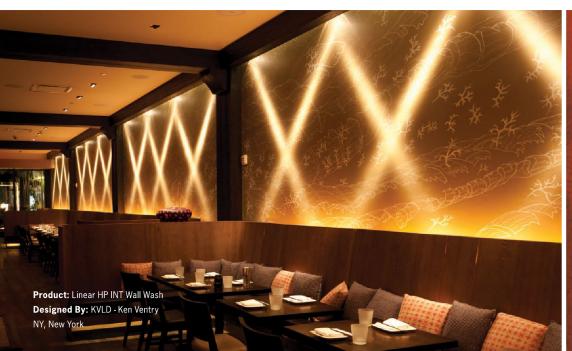
Along with the online questionnaire, which asks lighting designers whether the domains are relevant to their field of practice and accurately reflect their work, the task force is concurrently testing a prototype application and scoring-and-assessment model with a trial group, a process that will take place over several months. After the group presents its recommendation to the IALD board of directors in August, the task force's next step will be to develop a business plan that includes a marketing campaign, financial plan, and interim governance structure for the credential. Any costs associated with the application will be determined as part of that process.

While the financial structure is still being determined, Marsha Turner, the IALD's executive vice president, expects that the certification's governing body, not the IALD, would collect the fees, and that the fees would go toward paying for the program's expenses, such as processing applications. The IALD would likely be reimbursed for its staff's administrative time, but at a reduced rate in order to support the program.

If successful, a lighting-design certification could ultimately be a way to help lighting designers become a de rigueur part of architectural construction projects, Theobald says. "It'd be absolutely wonderful if we came out of this and we were at the same stage as architects," he says. "It can only help us in terms of raising awareness of lighting design if we have a formalized profession." •



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**PHILIPS** 





# **LIGHTING AND LONGEVITY IN LAS VEGAS**

The designers of the Smith Center for the Performing Arts foced a unique challenge: to create a building for the oges in Sin City.

text by Aaron Seward photos by Steven Hall/Hedrich Blessing

From its signage-as-architecture heyday in the post-World War II era to the gargantuan theme resort casinos of today, the built environment of Las Vegas has operated by one guiding principal: If it's outmoded, implode it, and build something bigger and better. Because of this model of development—and the fact that what has been built represents a pastiche of the most far-flung styles imaginable, from medieval castles to modern glass-and-steel skyscrapers—there is no one discernible architectural style that could be said to be essentially Las Vegas.

But that demolish-and-rebuild trend is changing. In recent years, many of the major casinos have begun to renovate their interiors when they become outdated, hinting that the Strip and the city that serves it may be settling down into a state of semipermanence. More pertinent, though, is the fact that the City of Las Vegas has kicked off an initiative to transform a disused railway vard near the downtown core into a pedestrianfriendly and culturally vibrant urban environment designed not for tourists, but for local residents.

The first part of the downtown master plan to be completed is the Smith Center for the Performing Arts, a \$475 million, 358,000-square-foot, state-of-the-art, multiuse facility that opened in March. It features three performance spaces including: the 2,050-seat Reynolds Hall and an education center known as the Boman Pavilion, which includes a 250-seat cabaret theater and a rehearsal space. The project's developer—a public private consortium of the city, the Reynolds Foundation, and other private donations—charged Washington, D.C.-

**DESIGN** 

based architecture firm David M. Schwarz Architects (DMSAS) with a daunting challenge for the venue: to design a timeless building that would undeniably evoke the spirit of Las Vegas itself.

"There is no indigenous Las Vegas style," explains DMSAS founder and principal David Schwarz. "So the first struggle was to come up with a common vocabulary. Our reference point was the Hoover Dam."

Lying a mere 35 miles outside of central Las Vegas, the Hoover Dam played an essential role in making Sin City what it is today. It provides a source of water and hydroelectric power in the midst of the desert. And during the Depression, when it was being built as part of the Works Progress Administration program, the dam provided Sin City's gambling halls and houses of ill repute with a steady stream of workers who had money to spend—a rarity in those meager times.

DMSAS found inspiration in the elegant massing and articulation of the dam's water-intake towers; the care taken with concrete and stone finishes; and the incorporation of art, iconography, and ornamentation. The architects translated these cues into two Art Deco-inspired buildings—Reynolds Hall and Boman Pavilion—which are separated by a shared courtyard. Both structures' stone façades are intricately detailed with sunbursts and chevrons and accented by stainless steel window grilles, canopies, and balcony balustrades. Reynolds Hall is anchored at one corner by a 170-foottall carillon tower outfitted with 47 brass bells. The interiors of both structures are richly hued—Boman in a palette of sea-foam greens, Reynolds in cognac

22

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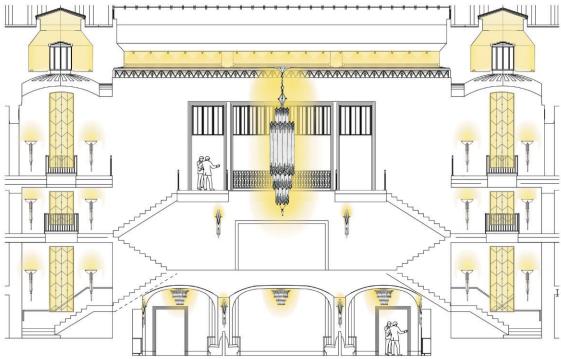
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types of lamps: 25W to 6oW incandescents and 2-footlong, 4oW compact fluorescents. Preset dimming scenes allow the building operators the option of turning on only one type of lamp or blending them both to adjust the level of warm or cold light for the occasion. The intention was to use the incandescent lamps for special events and performances to take advantage of their warmth and soft light, and to use the fluorescents during non-performance times to reduce overall energy

consumption and relamping needs.

The interior of the performance hall is almost completely lit with line-voltage incandescent lamps; no ballasts or transformers are allowed because of the hall's acoustical requirements. The exception is the 8.9W surface-mounted LED luminaires placed at regular intervals along the balcony fronts as well as edge-lit LED spires at the tops of the room's Art Deco pilasters. The custom LED dentils create visual interest and texture and help to break up the mass of the balconies and highlight the sweeping curves of the architecture.

The Smith Center will be the first major multipurpose performance venue in the U.S. to earn LEED Silver certification, a surprising distinction considering the conventional wisdom that there is no such thing as a sustainable building in Las Vegas. "The dual-system control approach helps with energy and maintenance issues, but we still had to add up all the wattage in the project," Brady says. "Both incandescent and fluorescent sources are included in the overall watts-per-square-foot calculations, even though they won't all necessarily be on at the same time. Even then, we were still able to meet the LEED guidelines by diligently distributing the lighting loads throughout the project."

As with any revivalist architecture, the success of the Smith Center lies in the execution of its details. And the most impressive of the lighting details is certainly the fixtures, which exhibit a pride in craftsmanship that hopefully points to a more stable future for the city. The elegance and beauty that these fixtures so gracefully possess, however, will only be validated by what they illuminate. In the words of David Schwarz, "Las Vegas is a place to experience other people. Lighting in Las Vegas is about making people look good." •





For the Smith Center for the Performing Arts, lighting design firm SBLD Studio developed a suite of custom luminaire designs to give scale to thew interior spaces and complement the material finishes. In the lobby areas (above and top), the family of chandeliers, decorative pendants and sconces provide a grand and graceful form of illumination. The fixtures use nickel-plated brass and white-flashed opal glass to recall an Art Deco look.

browns—and decadent in their material choices, featuring terrazzo floors, Venetian plaster walls, and more stainless steel balustrades and grilles, all detailed in the same motifs found on the exterior.

To light these resplendent spaces meant selecting the right luminaire style: decorative fixtures. "In a project like this, we think of the lighting like pieces of jewelry," says Susan Brady, principal of New Yorkbased lighting design firm SBLD Studio. "We started by doing extensive research into the Art Deco period and what that meant stylistically so that we could reference a manageable collection of period fixtures as our inspiration launching point. It was key to determine the correct scale for all the fixtures and balance the proper amount of illumination with the appropriate look and design. Once we agreed on the primary forms and shapes, we began to build a collection of custom fixtures that are unique to the Smith Center, incorporating elements of the building iconography, such as the chevrons and rays, developed by DMSAS."

SBLD refined their designs into four families of fixtures—cylindrical pendants, wedding-cake chandeliers, umbrella chandeliers, and fan-shaped sconces. SBLD developed detail drawings for all of the custom fixtures, and they were all fabricated locally, in Las Vegas, using nickel-plated brass and white-flashed opal glass—a clear glass treated with a thin layer of white ceramic that diffuses light, avoiding the hot spots that you get with frosted glass. Some fixtures incorporate colored art glass details that coordinate with the various finishes. Most of the major spaces also feature decorative fluorescent linear coves with scalloped frosted-glass diffusers to help fill the large rooms with ambient light.

"While the fixtures are Art Deco in appearance, they are very modern in performance," explains Gregory Hoss, DMSAS's principal-in-charge of the project. "We incorporated many of the building's mechanical systems into the fixtures, including sprinkler systems and ventilation."

The lighting designers outfitted many of the large chandeliers, pendants, and coves in the lobbies and other public spaces with dual control for two separate

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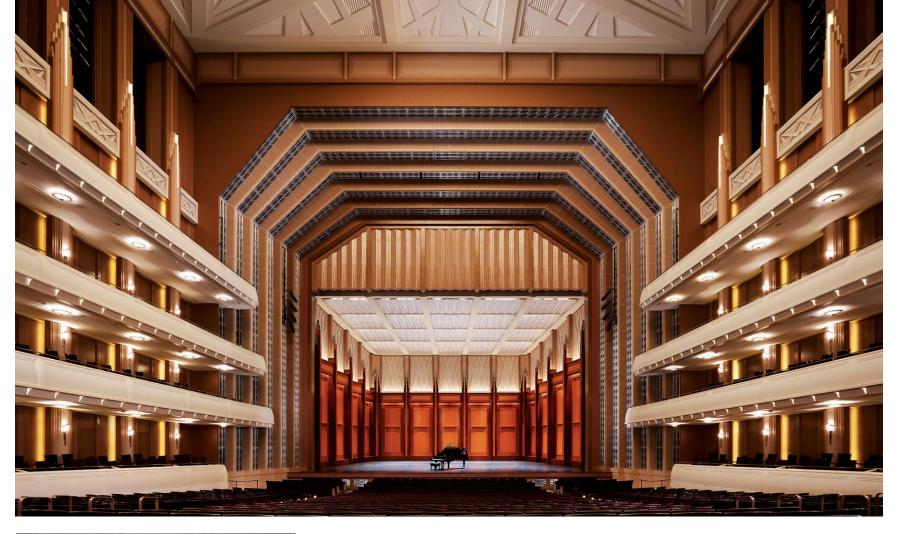














The main performance space, the 2,050-seat Reynolds Hall, is designed to host orchestra, opera, dance, and Broadway productions (top). It is almost completely lit with line-voltage incandescent lamps; no ballasts or transformers are allowed because of the hall's acoustical requirements. The exception is the 8.9W surface-mounted LED fixtures placed at regular intervals along the balcony fronts as well as edge-lit LED spires (above).



## Details

Project: The Smith Center for the Performing Arts, Las Vegas Client: The Smith Center for the Performing Arts, Las Vegas Client Representative: The Projects Group, Fort Worth, Texas Architect: David M. Schwarz Architects, Washington, D.C. Architect of Record: HKS, Dallas Lighting Designer: SBLD Studio, New York Theater Consultant: Fisher Dachs Associates, New York Acoustician: Akustiks, South Norwalk, Conn. Structural Engineer: Walter P. Moore, Dallas M/E/P Engineer: MSA Engineer, Las Vegas Project Cost: \$475 million Project Size: 358,000 square feet Manufacturer: Creative Light Source, Las Vegas (manufacturer of all custom luminaires)



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TECHNOLOGY

# CONTROLLED EFFICIENCY

Meet the future of lighting design, light on energy and heavy on controls.

text by Craig DiLouie illustration by Tang Yau Hoong

Today, we are in the midst of an era of regulated efficiency. And as a major consumer of electric energy in commercial buildings, lighting is subject to a large host of design restrictions and control requirements. Various product standards are affecting the availability of lighting equipment, while municipal lighting ordinances are setting boundaries on outdoor lighting design, and energy codes are dictating building design efficiency.

Case in point: Within the next two years, tighter lighting-power allowances and more intensive use of automatic lighting controls will become required practice as commercial building energy codes, which will have to be at least as stringent as the ASHRAE/IES 90.1-2010 standard, are adopted across the United States.

As energy codes grow more complex, it becomes more difficult to provide good lighting while complying with them, which makes any lighting designer who can do that well highly valuable.

## The 90.1 Standard

Produced by ASHRAE and the Illuminating Engineering Society (IES), 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, provides a template for legal jurisdictions to regulate commercial building energy efficiency to a model design standard. First published in 1975, the standard was republished in 1980, 1989, 1999, 2001, 2004, 2007, and 2010; the intent is to update it every three years. (The process for developing

the 2013 version has already begun.) Today, most states have either adopted 90.1 or the International Energy Conservation Code (IECC) as their commercial energy code, created a code based on one of them, or built a state-specific code with similar requirements. The IECC references 90.1 as an alternative compliance standard, although the 2009 version requires that the building be designed to either 90.1 or IECC in whole, not selectively. While this can simplify code inspection, it can also reduce lighting-design flexibility if the design team chooses the IECC—as this model code does not offer the Space-by-Space compliance method.

The Energy Policy Act of 1992 established ASHRAE/IES 90.1-1989 as the national reference standard, and gave the Department of Energy (DOE) the legal authority to update it. In 2002, the DOE recognized the 1999 standard, which went into effect in 2004; in 2008, the DOE recognized the 2004 standard, which went into effect in 2010. So, by Dec. 30, 2010, all states had to institute a commercial building energy code at least as stringent as ASHRAE/IES 90.1-2004. If they didn't, they had to justify why they could not comply.

In July 2011, the DOE recognized the 2007 standard, and the department issued a rule requiring ASHRAE/ IES 90.1-2007 compliance for all new federal buildings for which construction begins on or after Oct. 11 of this year. Then, in October 2011, the DOE recognized the 2010 standard as the new national reference standard.

Within the next two years, tighter lightingpower allowances and more intensive use of automatic lighting controls will become required practice as commercial building energy codes are adopted across the United States. As energy codes grow more complex, it becomes more difficult to provide good lighting while complying with them, which makes any lighting designer who can do that well highly valuable.

which will go into effect Oct. 18, 2013. At the time of that announcement, more than half of the states had a code in place that was at least as stringent as ASHRAE/IES 90.1-2007, according to information available at the DOE's Building Energy Codes Program website (www.energycodes.gov).

If history is any guide, about 37 states will comply with the new standard, while the other 13 likely will not for various reasons, such as home-rule state constitutions (although there may be significant adoption at the level of local governments). Initial adoption is expected in energy-progressive states, typically those in the Pacific Northwest and the Northeast, and local jurisdictions, such as Seattle and New York City, which often implement even stricter codes than those required at the national level. ASHRAE/IES 90.1-2010 is more comprehensive, more stringent and more complicated than its predecessors, representing the most dramatic revision of the standard since 1999.

#### **Lighting Aspects**

ASHRAE/IES 90.1 contains both prescriptive and mandatory provisions. The prescriptive provisions establish maximum-allowed lighting power density (LPD, in watts per square foot), broken down by building and space type. Designers may then choose to comply with the LPD cap on the basis of either building area by building type (Building Area Method), space-by-space basis by space type (Space-by-Space Method), or total building (Energy Cost Budget Method).

The Space-by-Space Method provides more design flexibility than the Building Area Method because it allows the total installed lighting wattage in the building to be calculated by assessing individual spaces,

with additional tradable power allowances. It is more precise because the total lighting power allowance is not calculated as a one-size-fits-all value based on a building type, but as the sum of a series of space power allowances, some of which have higher allowances.

ASHRAE/IES 90.1-2010 expands the scope of the standard to explicitly include existing and new construction. If a project includes lamp-plus-ballast retrofits in which more than 10 percent of the connected interior or exterior lighting load is replaced, the lighting in the affected area must comply with the standard's LPD limits and automatic shutoff requirements. If a panelboard upgrade is undertaken to achieve schedule-based shutoff function, some form of override is not explicitly required, but should be included.

Whole-building and space LPD caps are significantly reduced in ASHRAE/IES 90.1-2010, based on modeling using the latest commercially available lighting technologies and current IES light-level recommendations. The maximum lighting power allowance (in terms of energy efficiency) is reduced—by an average 17 percent—in 29 out of 32 building types, with three exceptions, which were given the same or higher power allowances: automotive facilities, hospitals, and hotels.

Two new credits for design are now available that make the Space-by-Space Method more flexible. The first is a power-adjustment credit to help designers account for room geometries that are oddly shaped. The second is a list of power-adjustment credits for using advanced lighting-control strategies in certain office, meeting, education, or retail sales areas, as well as in public spaces. Qualifying strategies range from manual dimming to automatic continuous daylight harvesting, with power-adjustment factors applied to the controlled



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Daylight harvesting is now required, and standard 90.1-2010 defines daylight zones around windows, skylights, and roof monitors. If these daylight zones exceed a certain size, the general lighting in the zones must be separately controlled using either a stepped-switching or continuous-dimming controller. More aggressive daylight-harvesting control, including secondary sidelighted daylight zones farther away from windows, is rewarded with power adjustment credits.

lighting load of 5 percent to negative 30 percent.

For exterior lighting, a new zone-based system is introduced (LZo through LZ4), covering application environments in order of increasing population density, with accompanying higher light levels and associated power allowances. For example, lighting for sales canopies is limited to 0.6 watts per square foot in a rural area, but increases to 1.1 watts per square foot in an urban commercial district. Most applications are expected to fall in the middle categories of neighborhoods and light-industrial districts, which in general have lower power allowances than the last version of the standard.

Finally, ASHRAE/IES 90.1-2010 requires that certain documents be turned over to the owner within 90 days of acceptance, including as-built drawings of the lighting and control system, a recommended relamping program, a schedule for inspecting and recalibrating controls, and a complete narrative of how each lighting-control system is supposed to operate, including recommended settings.

#### **Control Aspects**

ASHRAE/IES 90.1-2010 contains a comprehensive list of mandatory lighting-control provisions, especially as it recognizes more advanced strategies with power adjustment credits. For more detail, read the full standard.

Automatic shutoff is still a staple, but now it applies to buildings of any size, not merely those larger than 5,000 square feet. Occupancy sensors are now required for a long list of interior applications, from classrooms and lecture halls to restrooms and office spaces up to 250 square feet. Exterior lighting must be controlled by a photosensor, and building façade and landscape lighting must also be controlled by a switch that turns the lights off during the night when they are no longer required.

Interior and exterior lighting must be more flexible, using multilevel control, particularly in spaces where lighting must remain on but is intermittently used, such as stairwells, parking garages, and some exterior spaces. Manual controls must provide a step between 70 and 30 percent of full lighting power. All automatic controls must be either manual-on or must automatically turn the lighting on to not more than half of full lighting power.

Daylight harvesting is now required, and standard 90.1-2010 defines daylight zones around windows, skylights, and roof monitors. If these daylight zones exceed a certain size, the general lighting in the zones must be separately controlled using either a stepped-switching or continuous-dimming controller. More aggressive daylight-harvesting control, including secondary sidelighted daylight zones farther away from windows, is rewarded with power adjustment credits. Also, it is required that perimeter lighting in parking garages automatically lessens in response to daylight.

ASHRAE/IES 90.1-2010 also requires that all lighting controls and systems be functionally tested, and that the construction documents identify who will conduct and certify the testing. All lighting controls and associated software must be calibrated, adjusted, and programmed to operate in accordance with construction documents and manufacturer installation instructions, with specific requirements identified for occupancy sensors, programmable schedule controls, and photosensors.

Going forward, as the next round of commercial building energy codes are adopted, lighting designers will continue to be under pressure to provide lighting solutions that meet ever more strict energy parameters. And lighting practitioners will find new ways to marry design creativity with due diligence. •





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#### **PRESENTATIONS**

Lighting 2036

Future of Lighting—

All Light is Natural

Thoughts on the Future of Light Johannes Rudolff

Living in the Dark

From Mona Lisa to Mocha attes: LEDs Hit Primetime Mitigating the **'Excess' Sky** Rohit Manudhune

Emotional Lighting Jeannine M. Fisher

The Future of Light **Is Time** Leni Schwendinger

Future of Lighting

Light in Tandem

Vivid Light

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## **PRODUCTS**

edited by Elizabeth Donoff text by Elizabeth Donoff and Wanda Lau

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**Spellbound, Corbett Lighting** • Spellbound takes its inspiration from 1950s orbit chic. It uses high-powered and ultrathin LEDs as the illumination source. Available in several high-polished finishes, including gold leaf (shown), the flat-edged spiral form is accentuated by the positioning of a bold diagonal rod that runs through the luminaire's center. • corbettlighting.com • Circle 270

Aureole Chandelier, jGoodDesign • The Aureole Chandelier is composed of hand-blown glass and hand-brushed aluminum or brass. Rings of gold leaf, silver leaf, white, or custom colors line the interior of each glass shape. When illuminated, they create an optical effect. Each chandelier is custom designed for its location. The glass shapes can be suspended by cords or by metal stems (shown). Lamping options include: incandescent, LED, halogen, or fluorescent. Glass color options include: clear, gray, steel blue, amber, black, olive gray, red, bronze, champagne, or dark purple. • jgooddesign.com • Circle 271







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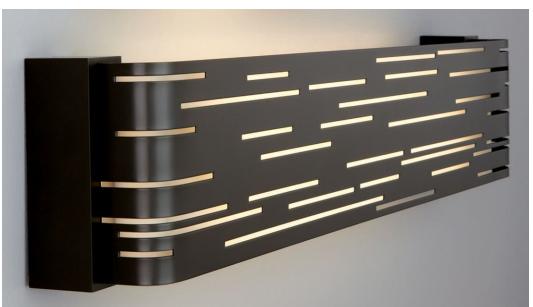
Learn more at toshiba.com/lighting. Toshiba LED Lighting. Ready for Work.



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Revel Linear, Tech Lighting • The metal surface of the Revel wall sconce is laser-cut with multiple horizontal slots that allow the light to shine through an inner white-acrylic diffuser to provide a soft illumination. It measures 27 inches long by 6 inches tall and can be mounted either horizontally or vertically. Optional wood endcaps add a material contrast. Lamping options include either two 14W T5HO linear fluorescents or one 18.5W 2700K LED strip. Finish options are: antique bronze, gloss black, satin nickel, and gloss white. Revel is also ADA-compliant. • techlighting.com • Circle 275







Caspian Grande, Tech Lighting • The Caspian hand-blown glass pendant is inspired by Moroccan motifs, and can be hung individually or grouped together. Its glass shape is available in either a smoke color or a steel blue, and measures 12 inches in diameter and 20 inches tall. Canopy finish options include antique bronze, black, satin nickel, and white. Lamping options are either a 60W A19 Classic Edison lamp or an 11W self-ballasted compact fluorescent Plumen lamp. The luminaire comes with 12 feet of field-cuttable cable for installation. • techlighting.com • Circle 278

Chateau Pendant, Boyd • The Chateau family of luminaires includes an indoor/ outdoor lantern (shown), a sconce, and a pendant. Chateau has both a halogen and an LED version. The LED version, which measures 27 inches tall by  $9^{3}/4$  inches at the widest part of the housing, positions the LED source deep in the Mansard-inspired roof. It has a color temperature of 2700K, a CRI of 90, and consumes only 10W of power. The housing is composed of  $^{1}$ /4-inch-thick plate aluminum to provide strength and durability without being too heavy. Powdercoat finish options include black granite, cinnamon bronze, matte white, and silver fog. • boydlighting.com • Circle 279



La Simplex, Ligne Roset • The Simplex desk lamp, designed by French design student Guillaume Bloguet, was awarded second place in the Cinna Competition for young designers. An LED strip serves as the  $\,$ illumination source in the fixture head, while also highlighting the shape of the lamp itself. It measures 7.67 inches wide by 9.64 inches deep by 11 inches tall. It is available in four colors: black, white, green-beige, and pastel turquoise. It is sold in sets of three of the same color. • ligneroset.com • Circle 280





Falena, Foscarini • Designed by Lucidi & Pevere, the Falena wall luminaire is discrete but functional. The front metal extrusion screens and directs the light so that it uplights and downlights the wall surface without any glare. Available in three lengths—9, 30, and 51 inches—the housing is composed of a lacquered aluminum housing and is available in a white or a gray finish. Lamping option include halogen (80W and 100W) and fluorescent (24W and 54W). • foscarini.com • Circle 281

**AL** May 2012



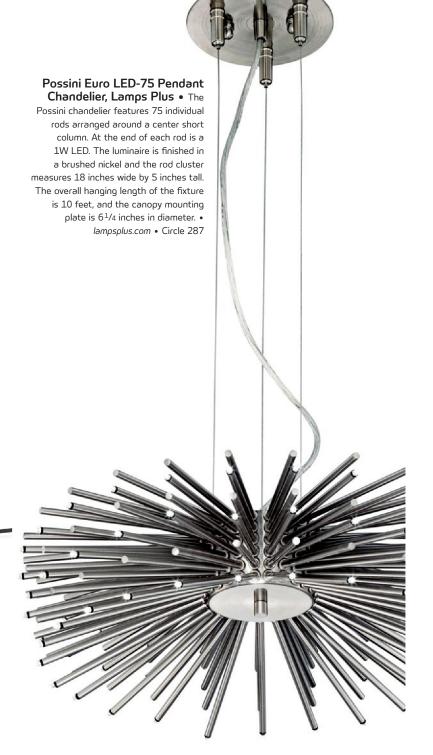
Posted Dome Chandelier, jGoodDesign • The Posted Dome Chandelier is composed of hand-blown glass and hand-brushed aluminum or brass. Its designer, Jeff Goodman, describes the oblong glass forms as "soothing, yet playful." Each chandelier is designed for its specific installation site and can be arranged in different configurations and dimensions. The glass shapes can be suspended by cords or by metal stems (shown). Lamping options include: incandescent, LED, halogen, or fluorescent. Glass color options include: clear, wispy white, translucent white, gray, Caribbean blue, steel blue, amber, black, olive gray, grayish green, red, bronze, champagne, or dark purple. Each piece is signed by the artist. • jgooddesign.com • Circle 282















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## **SLEIGHT**

North American Headquarters for a Foreign Bank New York, New York Architect: Gerner Kronick + Valcarcel, Architects, PC

Sleight is a performance LED product with a semi-recessed low profile to allow easy integration into architectural elements. The power supply may be remote (PSX models) or integral. Low voltage power supplies from Oldenburg Electronics may be ordered separately from Visa Lighting for PSX model fixtures and may be shipped prior to fixture.

The Oldenburg Electronics PS24 Series of Power Supplies uses Class II cabling and connections to multiple fixtures which may provide significant cost savings.



Visit **www.OldenburgElectronics.com** for more information about the PS24 Series of power supplies



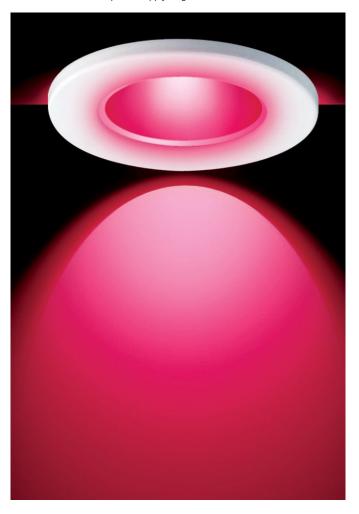
## **DOWNLIGHTS**



**Airport, Schmitz Lighting** • The Airport pendant luminaire is designed to provide a general or directed light distribution, has two reflector options—opal glass or metal—and can be used with a 42W GX24 lamp, a 70W G12 lamp, or a 150W G12 lamp. The housing is finished in matte nickel and the steel-cable suspension allows for field adjustability. The fixture is both rotatable and tiltable, works with an electronic ballast, and can be dimmed. Overall dimensions are 56.5 inches tall to the ceiling canopy mount and 3.8 inches in diameter at the bottom of the reflector. • inter-lux.com/manufacturer/schmitz • Circle 292

Zelara 4FL and 6FL Series, Zenaro Lighting • The Zelara LED downlight, designed to provide accent lighting in retail and hospitality venues, is available in two diameters—4 inches and 6 inches—and has a shallow installation depth of just under 1 ³/4 inches. The luminaires have four beam spreads (15, 35, 50, and 110 degrees) and two color temperatures (2700K and 5700K). The flange rim sits flush for mounting and can be adjusted by 15 degrees once installed. The LED circular arrays are available in configurations of three, six, or eight high-power LEDs, which are secured via a PMMA lens. • zenarolighting.com • Circle 290

3" RGBW Recessed Light, Coloronix • Designed for direct ambient or accent lighting, the miniature die-cast,  $4^1/4$ -inch aperture, LED downlight by Coloronix features color-changing capabilities while only consuming a maximum of 9W. (It is meant to be comparable with a halogen MR16 outfitted with color filters.) The luminaire's InternaMix color-mixing system provides smooth, one-color output, drawing on the luminaire's four individual LEDs: one red, one green, one blue, and one neutral-white (4000K). The 120V or 277V AC input with a direct DMX control allows for individual control of each LED with a four-channel DMX address. This eliminates the need for a remote data enabler or power supply. • rgbw.com • Circle 291



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#### Halo H4 Adjustable Gimbals, Cooper Lighting •

The Halo H4 LED 4-inch adjustable gimbals family of luminaires feature adjustable gimbal trims and an LED light engine. Round and square trims are available with a 35-degree tilt. Interchangeable optics (the gimbals come with a clear glass lens) with three beam spreads—25, 35, and 50 degrees—are also an option, as are four color temperatures—2700K, 3000K, 3500K, and 4000K. Trim finishes come in white, satin nickel, and Tuscan bronze. • cooperindustries.com • Circle 293







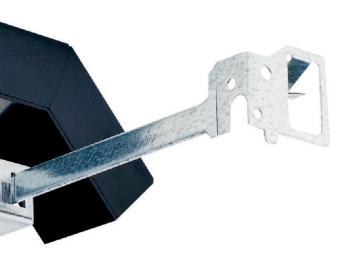
#### Eco-Downlight LED Mini Generation 2, Creative Systems Lighting

• The Eco-Downlight LED Mini features a 2-inch aperture and is available in four interchangeable optics: 25, 45, 65, and 85 degrees. It uses 14W, delivers 700 lumens, and has a CRI of 80. Well-suited for new construction and retrofit applications, it is California Title 24-compliant. • csllighting.com • Circle 295

Beyond Halogen, No. 8 Lighting • The Beyond Halogen family of LED fixtures includes adjustable (J lamp), fixed (K lamp), wallwash (L lamp), and mirror reflector (M lamp) modules for IC and non-IC housings.

The entire line is California Title 24 compliant and can be used with other of the company's luminaires. The line uses Philips Lumileds' Luxeon-S LEDs with a 3000K, 85 CRI, 1,050-lumen light engine. The fixtures also use No. 8 Lighting's proprietary dimming driver, which features 120V/60Hz input, two-wire dimming control, and is dimmable to 5 percent of full output. • Blighting.com • Circle 296







ICL-LED 1600, Intense Lighting • The ICL-LED 1600 is a recessed multilamp fixture that provides up to 1,600 lumens per lamp head, the first, according to the manufacturer, at this small of an aperture—2 inches. It is offered in one-, two-, three-, or four-lamp models, and its deep, recessed-LED array addresses shielding and glare control. Color temperature options include 2700K, 3000K, 3500K, and 4000K with a CRI of 82, or 92 (only for 2700K and 3000K). The luminaire also has four beam spreads: 16, 24, 32, and 50 degrees. Zero-to-10V dimming is a standard feature. • intenselighting.com • Circle 297

## Energy-Saving Xicato™ LEDs Lightfair Booth# 6738

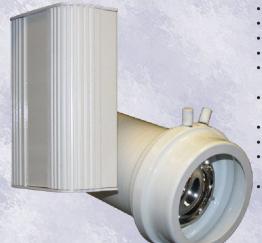
X7 12.4W, 700 Lumens Xicato™ LED



100-277 Volt available

- 12.4-Watt Xicato™ module
- 50,000 Hour life
- Integral electronic driver
- 20°, 40° and 60° Fieldchangeable reflectors
- Choice of color temperature: 2700, 3000, or 4000.
- CRI ≥80 (≥95 as an option)
- No UV or IR
- Dimmable (optional)
- Can accept 2-3 accessory elements

X20 36.3W, 2000 Lumens Xicato™ LED



- 100-277 Volt available
  - 36.3-Watt Xicato™ module
- 50,000 Hour life
- Integral electronic driver
- 20°, 40° and 60° Fieldchangeable reflectors
- Choice of color temperature: 2700, 3000, or 4000.
- CRI ≥80
- No UV or IR
- Dimmable with onboard dimmer (optional)
  - Can accept 2-3 accessory elements



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## **DIRECT/INDIRECT**

Station, Peerless Lighting, Acuity Brands • Designed for transportation applications, the Station direct luminaire can be used with either 32W T8, 28W T5, or 54W T5HO linear fluorescent lamps. It is available in 4-foot and 8-foot lengths, and the fixture housing, which measures 10 inches long by 35/16 inches deep, is composed of extruded aluminum. The fixture interior is accessed via a three-piece, extruded-aluminum-and-polycarbonate hinged-and-latched door. The lens is composed of a UV-stabilized polycarbonate. Standard finish is metallic gray, and custom options are also available. The luminaire is IP65-rated (dust and watertight), and UL- and CUL-listed for wet locations. • peerless-lighting.com • Circle 298



**io Lili, Cooper Lighting •** The 2-foot by 2-foot recessed Lili LED indirect luminaire is designed to replace 2-foot by 2-foot fluorescent fixtures. The LEDs are centered in a low-profile decorative pendant (the light engine), which also serves as the heat sink. Three decorative heat sink designs are available. Lili produces 3574K, draws 63W of power, and can be dimmed to 5 percent of full power using a zero-to-10V DC control circuit. • *cooperlighting.com* • Circle 299



Arris1, a • light • Designed for commercial, institutional and residential settings to provide ambient indirect lighting, the Arris family of luminaires features a low-profile for clean architectural lines. The housing, composed of 60 percent recycled aluminum extrusions, measures 1.875 inches tall by 2.75 inches wide and comes in standard lengths of 3, 4, 5, 6, 8, 9, 10, or 12 feet. The luminaire is meant to be used with T5 or T5HO  $\,$ lamps. It can be ceiling-suspended or wall-mounted. Powdercoat finish is standard and comes in several colors including satin black, satin white, gloss white, textured eggshell white, anodized, or any RAL color. It is ULand CUL-listed. • alights.com •







#### DL and DLTB Series, Engineered Lighting Products •

A new lens option is now available for the DL and DLTB Series downlights. The original fixture design placed the lens at the face of the fixture. The new RL option sets the lens 2 ½ inches above the face of the luminaire to provide a 32-degree cutoff. It uses diffuse parabolic side reflectors to produce a uniform spread of light while minimizing brightness. The luminaire measures 6 inches wide by 6 inches tall, and is available in either a length of 2 or 4 feet. UL-listed for damp locations. • elplighting.com • Circle 302

Link, Vibia • The Link lighting system, designed by Ramon Esteve, is a series of four different-sized square and rectangular modules with a matte white or charcoal-gray finish that can be joined in any configuration for a wide variety of ceiling silhouettes. The modules range in length from 45 inches long to 15³/4 inches wide. The modules can connect on any of their four sides and simply require that there be a 5¹/2-inch overlap of surface area. A single electrical connection can support up to eight modules. Link is fully dimmable using a zero-to-10V electronic dimming ballast, has a polycarbonate diffuser, and uses two, 2G11 lamps from 18W to 40W, depending on the size of the module selected. • www.vibialight.com • Circle 303



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Slide-A-Light, Bartco Lighting • The Slide-A-Light linear T5 fluorescent fixture is field adjustable from 2 feet to 3 feet to 4 feet, and can hold a single 14W, 21W, or 28W T5 lamp. It is designed to offer lighting specifiers flexibility so that they do not have to order multiple fixtures to accommodate different lengths, and instead can do that all with one fixture. The luminaire ships as a 2-foot unit. Other features include 120V to 277V universal voltage, program start, UL- and CUL-listed for dry and damp locations, dimming options, and Bartco Lighting's patented rotating, locking sockets. • bartcolighting.com • Circle 304



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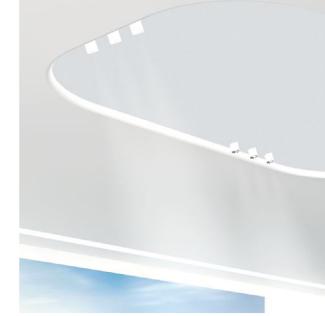
DIRECT/INDIRECT



Vertex, Litecontrol • This high-performance Vertex direct/indirect pendant designed for classrooms uses T8 lamps. It provides 65 percent uplight and 35 percent downlight. However, optional optical components can be added to change the distribution allocation to create these configurations: 35 percent uplight and 65 percent downlight, 20 percent uplight and 80 percent downlight, or 100 percent downlight. Vertex is available with a white blade baffle option or a soft-glow lens option. A fixture-integrated photo sensor that works with Litecontrol's daylight-harvesting control solution is also available. • litecontrol.com • Circle 305

TZ-200 Cove/Gypsum Series, Schmitz Lighting • The TZ-200 covelighting system uses a cove element made of fiber-reinforced plaster to provide a seamless installation in plasterboard ceilings. Specially rounded contours create evenly illuminated circles, ovals,

rounded contours create evenly illuminated circles, ovals, or arches without visible edges or corner seams. A variety of lamps can be used with the system, including T5 or LEDs. • inter-lux.com/manufacturer/schmitz • Circle 306





#### Bionic 4" Modular System, Prudential Ltg. •

The Bionic continuous channel linear slot system for large-scale, Class A spaces (public-transportation centers, hospitals, universities, and courthouses) provides a 4-inch fluorescent recessed system with three lamp options: standard T5 or T8, staggered T5, or the seamless T5 lamp by Osram. A MR16 lamp option is also available and features a 30-degree aperture-centered tilt and 363-degree rotation to eliminate blind spots. Using Prudential's FusionOptics with a clear or frosted acrylic lens, produces a fully orbed optical chamber. Multiple snap-in ceiling options are available including: T-Bar, slot grid, hard-ceiling flange trim, hard ceiling mud-over flange, and Armstrong's Interlude system. • prulite.com • Circle 308

**LightFrame, Sefar •** The LightFrame system, suitable for interior and exterior applications, provides a complete lighting and acoustical solution using the company's wrinkle-free architectural fabrics that achieve, according to the manufacturer, light-transmission rates of more than 90 percent. The system's lightweight supporting structure is easy to assemble by hand. Locking screws bring the edges of adjacent frames tightly together for the necessary prestress. A half-elliptical profile minimizes shadows even when there is background lighting. The fabric can be combined with a translucent or opaque ETFE film for the required photometric and acoustic properties. • sefar.com • Circle 307







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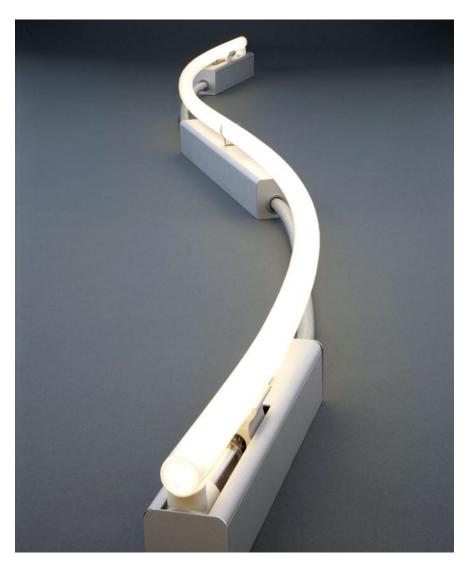


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Fraqtir Point, The Lighting Quotient • The Fraqtir Point LED luminaire features a proprietary optic that uses the principles of refraction and total internal reflection to produce an asymmetric distribution of light. Style S099, the wallwash version, is 7.5 inches long by 2 inches in diameter with a 5-inch-diameter canopy. The luminaire is powered by Philips Lumileds Luxeon A LEDs in 2700K and 3000K. According to The Lighting Quotient, 3500K and 4100K are expected soon. The optical assembly is composed of an extruded impact-resistant acrylic snap lens. An extruded aluminum heat sink provides thermal management, and optional dimming to 0.1 percent is available. • the lighting quotient.com • Circle 309

## **WALLWASHERS**



#### CLS-Slim, Cathode Lighting Systems • The

CLS-Slim measures  $1^{5}/8$  inches wide by  $2^{3}/8$  inches tall, achieving the smallest cold-cathode luminaire on the market today, according to the manufacturer. Two models are available, the Straight (CLS-Slim) and the Flexible (FCLS-Slim, shown). The fixture can cover up to  $7^{1/2}$  feet in length and uses ultralong-life, highoutput, high-color-rendering T6 cold cathode lamps in 12 different white hues. The lamps snap in and out of the lampholders. Each luminaire is equipped with 1 percent integral diming ballast and is compatible with two-wire low-voltage dimmers. • cathodelightingsystems.com • Circle 310

> Pure Channel Wall Wash, Pure Edge Lighting • The Pure Channel Wall Wash system is designed for a variety of interior applications such as display, retail, and residential lighting, and can be sized in 2-inch increments up to 120 inches. The luminaire features an asymmetric lens inside a slim aluminum extrusion. Each foot of luminaire uses LEDs in three color temperature options—2700K, 3000K, and 3500K—all with a CRI of 80-plus, which translates to only 7W per foot. The luminaire can also dim with a zero-to-10V dimmer. • puredgelighting.com • Circle 311



 $\textbf{D2LED, Prescolite} \, \bullet \, \text{The D2LED downlight is now available in a wallwash model. The} \\$ 2-inch-aperture fixture is designed around the Xicato LED light engine. Proprietary optics using light-pipe technology with a 45-degree cut-off capture the light and transfer it down through the fixture to prevent glare. The luminaire's design also allows for even illumination starting at less than 6 inches below the ceiling. • prescolite.com • Circle 313





### options and uses either a single T5 or T5HO linear fluorescent lamp in $\,$

a trio of color temperatures—3000K, 3500K, and 4100K—all with a CRI of 80. It is available in four lengths—2, 3, 4, and 8 feet—and measures 3 inches tall by 5 inches deep. It features a die-cast, white, high-reflectance aluminum reflector, and for shielding uses a curved, crenulated diffuser of opal acrylic. • peerless-lighting.com • Circle 314

## **TRACKLIGHTING**



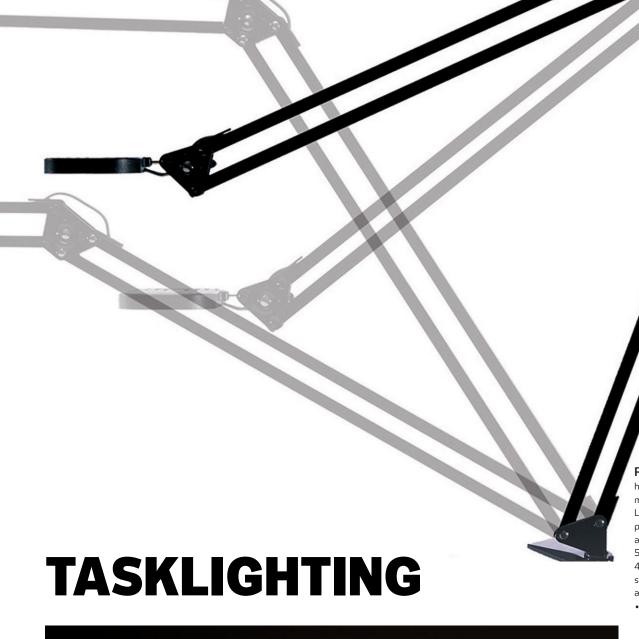
**LumeLEX 2030 Series, Lighting Services Inc** • The petite, stem-mounted LED spotlight by Lighting Services Inc—measuring just over 2 ½ inches—with a hidden driver, features the latest Remote Corrected Cold Phosphor technology from Xicato for its LED modules up to 11W. The fixture can be specified in two color temperatures—warm-white (2700K) or neutral-white (3000K)—and with a CRI of 97-plus (high) or 80-plus (standard). A locking stem ensures that the luminaire remains focused, horizontally and vertically. Accessories include louvers, spread lenses and beam softener, light-blocking screens, and dichroic color filters. The housing is available in four finishes: LSI Black, white, silver, and graphite. • *lightingservicesinc.com* • Circle 318







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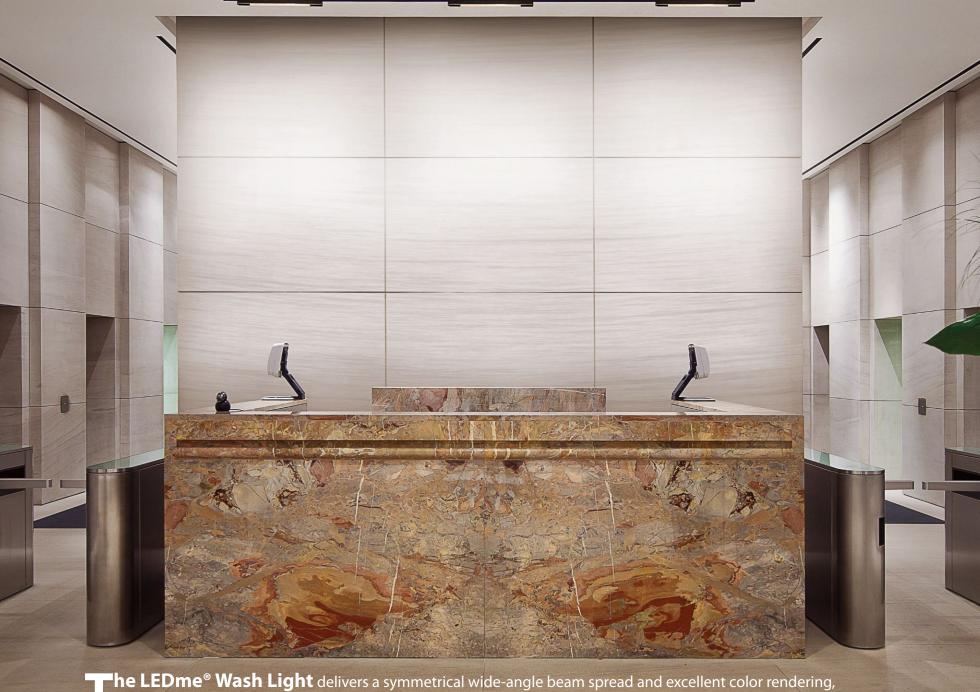
Element Disc LED Tasklight, Humanscale • Designed by Mark McKenna, design director of Humanscale, the Element Disc tasklight uses a thin-film LED  $\,$ technology to provide a color temperature of 3000K, a CRI of 80, and even light distribution. To achieve this, a series of high-intensity micro LEDs surround layers of polycarbonate and optical films to provide, according to the manufacturer, glare-free light. A dimmer switch on the fixture head allows for seven levels of light. The luminaire also features the company's passive infrared occupancy sensor, which responds to changes in the human heat profile and will automatically turn the light off when a person leaves the room. • humanscale.com • Circle 321

**Reach, Finelite** • The Reach LED tasklight features two head designs—Velo, a round-edged rectangle, and Viper, a modified pyramid shape. The lamp head houses a replaceable LED module and uses Cree's XP-E LEDs as the light source to provide a color temperature of 3500K and a CRI of 83 (Velo) and 82 (Viper). Reach also allows for full-range dimming to  ${\bf 5}$  percent with its QuickTouch dimmer, delivers between 47 (Viper) to 49 (Velo) lumens per watt, and has an 8W power supply that draws no power when turned off. The adjustable arm is 18 inches long, but is also available in a 12-inch length. • finelite.com • Circle 320



**LED Lightbar, Nora Lighting** • Designed for undercabinet locations in retail displays, furniture cabinets, closets, and built-in wall units, the slim-profile, California Title 24–compliant LED Lightbar measures just <sup>3</sup>/<sub>4</sub> inch wide by  $^{1}/_{2}$  inch deep. The housing is composed of a solid-aluminum extrusion and is available in five lengths: 6, 12, 24, 36, and 48 inches. The fixture uses 12 LEDs per foot—which translates to 3.3W per foot—and is available in 3000K and 4200K color temperatures. Eight-foot runs can be accomplished with a 30W driver; 16-foot runs with a 60W driver. Finish options are bronze (anodized) or natural aluminum. • noralighting.com • Circle 322





perfect for illuminating walls or signage. This sophisticated luminaire is an energy efficient track solution that dims to one percent with an electronic low voltage dimmer and is compatible with most existing track installations. An optimized thermal management system ensures a 50,000 hour rated life for hassle free maintenance.

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**Corvi Linear, Jesco Lighting Group •** The Corvi Linear is designed for a variety of display settings, including retail showcases, museum and fine-art galleries, reception counters, and display shelves. The low-profile, tubular-shaped metallic silver housing is available in four lengths: 12, 24, 36, and 48 inches. Multiple units can be adjoined for continuous runs. • *jescolighting.com* • Circle 323









Tevisio, Waldmann Lighting • Designed specifically for highly demanding task work, the Tevisio magnifier luminaire is composed of anodized aluminum and uses 48 4000K multichip LEDs to provide a CRI of 90 and 6,000 lux at only 14W. The reflector technology provides an even light distribution and can be dimmed down to 10 percent of full power. The luminaire's visualizer function enables separate switching to four light levels. The biconvex magnifying glass offers a total field of view of 153mm, so that an individual can look through the lens with both eyes without experiencing visual distortion. The 3.5 diopter lens option allows for magnification up to two fold, and the 8 diopter lens provides magnification close to four fold. • waldmann.com • Circle 327

Unilume, Tech Lighting • With undercabinet lighting for residential and commercial use in mind, the Unilume is available in two lengths: 13 inches and 19 inches. Both lengths are less than  $^{3}\!/_{4}$  inch deep. The luminaire uses 30 LEDs per foot via tightly clustered blue pump LEDs, a 98 percent mixing chamber, and a remote phosphor light source (Internatix's ChromaLit) to provide an even, linear, glare-free wash of light. An integrated LED driver means that there is no need for an external power supply and it allows for dimming down to 15 percent of full power using a TRIAC of electronic lowvoltage dimmer. The luminaire is available in 2700K with a CRI of 80-plus or 3000K with a CRI of 90-plus. Finish options are either black or white. • techlighting.com • Circle 325



# Eco-Counter, Creative Systems Lighting • The Eco-Counter is well-suited for undercabinet and workspace application installations. The luminaire features an integrated, electronic low-voltage dimmable 120V hardwired system, and does not require a remote transformer or driver. It is available in three models with different lengths: an 8-inch, 6W LED; a 16-inch, 12W LED; and a 24-inch, 16W LED. The manufacturer's SpeedLink technology and captive screws allow for easy installation. • csllighting.com • Circle 326



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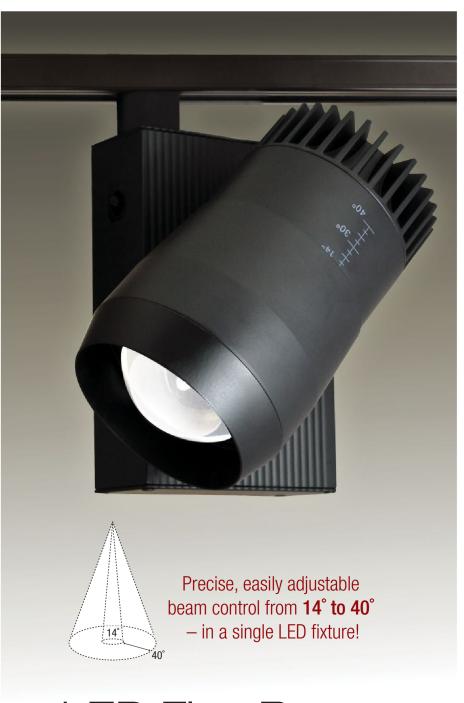
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## LED Flex Beam

#### Adjustable Beam Spread LED Track

Nora Lighting's new patent-pending lens assembly allows the architect, designer or end user to select a beam spread from 14 to 40 degrees in a single LED track fixture. The telescoping, die-cast aluminum shroud easily glides forward and back to adjust the beam spread from a narrow spot to a flood and includes markings for precise beam spread control. This energy efficient LED fixture has a high output of up to 2000 lumens and utilizes just 25 watts.



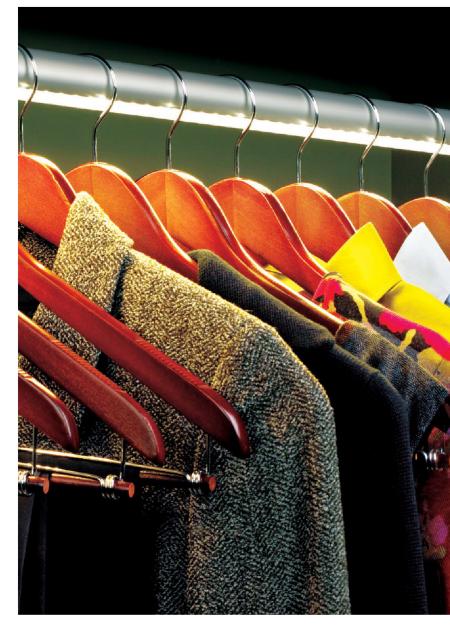
LED Pucks LED Track & Rail LED Recessed LED Tape Light LED Pendants LED Lightbar Plus

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C-light LED Hanging System, Winona Lighting, Acuity Brands • Designed to illuminate clothing, C-light is composed of a thick extruded aluminum with a natural anodized-aluminum finish. The hanging rod can hold up to 50 pounds per foot, and can be specified in any length up to 120 inches. For lengths greater than 48 inches long, a center support rod is required. Five color temperature are available: 2700K, 3000K, 3500K, 4000K, and 5000K. Power consumption is 4.5W per foot. The luminaire has both a 24V AC dimming and non-dimming option. • winonalighting.com • Circle 329

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#### Linea LED Bollard, HessAmerica •

The Linea LED Bollard is part of the larger family of Linea outdoor pole luminaires. The source is configured around five, three-diode clusters. A prismatic elliptical lens provides a wide (40 feet by 20 feet) asymmetric beam spread, so that the light does not stray above 90-degrees horizontal. The housing and luminaire shaft measures  $40^{1/2}$  inches tall and is a single piece made of aluminum finished in a textured paint. All hardware is stainless steel. A steel housing for high-abuse environments is also an option. Standard finish colors are: matte silver gray, metallic, or graphite gray. Custom colors are available. • hessamerica.com • Circle 332



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Halley, Vibia • Designed by Jordi Vilardell and Meritxell Vidal, Halley, named after the famous comet, creates an arched beam of light. Part of a full family of luminaires that includes floor-to-floor, floor-to-wall, and floor-to-clamp versions, the luminaire is composed of polycarbonate and aluminum, and is made up of three sections that click and lock together for east assembly. It uses one, 12W LED strip as the source with a frosted lens. It is ETL wet-listed and has an IP64 rating. • www.ibialight.com • Circle 334





Q-Light, Performance In Lighting • The Q-Light luminaire is made of a die-cast aluminum and mounted onto an extruded aluminum post. Finish colors are aluminum metallic and iron gray. High-performance reflectors provide a uniform distribution of light. The "R" models (shown) come with a louver to provide glare-free illumination. Lamping options include metal halide, fluorescent, and LED. The LED option uses 5W in two color temperatures: 3000K (warm-white) and 6000K (cool-white). • pil-usa.com • Circle 336

64 AL May 2012 OUTDOOR





Puntila, Schréder Lighting • Designed by Walter Giers, the Puntila luminaire is defined by its curved, tapered pole, which is available in heights ranging from 14 to 30 feet tall. The fixture heads, which measure 18.9 inches tall by 1.8 inches in diameter, use color as a design element and are available in South Beach blue, flamingo pink, gulfstream green, and sunkiss orange. Lamping options include 39W and 70W T6 metal halide. The luminaire is also IP66-rated. • schreder.us • Circle 338





**TLED-B, Trace-Lite, Barron Lighting Group** • This bollard features a high-performance LED light source (12 in total) that uses 27.5W and provides 747 lumens. It is available in two color temperatures—4000K and 5000K, each with a CRI of 75-plus. The housing is composed of extruded aluminum and finished in a UV-resistant powdercoat. It measures 39.5 inches tall and 6.9 inches in diameter. • barronltg.com • Circle 340





Double-Impact, Lucifer Lighting • The Double-Impact compact fixture (4.28 inches wide by 2.75 inches tall) has minimal sight lines but provides high illumination levels due to the wide slot aperture. It is fully dimmable, has a 6W double-array AC LED in 3000K. The LED-heat sink module is field replaceable. Accessories include custom theatrical color gels. Standard finishes include: white, black, metallic gray, architectural bronze powdercoat, brushed and natural stainless steel or bronze, industrial gray, chrome plate, and polished or matte oil-rubbed bronze plate. Custom finishes are also an option. It is IP65-rated. • luciferlighting.com • Circle 341

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**Boreal, Schréder Lighting** • The Boreal luminaire, designed by Laurent Fachard, features a stainless steel outer drum with a perforated design that recalls the look of a paper lantern. The internal lamp module has a clear acrylic lens, and lamping options include 70W, 100W, or 150W ED17 metal halide. Optional dichroic filters can be added on the interior to create colored effects. The luminaire measures 33.1 inches tall by 24 inches in diameter. It is IP66-rated. • schreder.us • Circle 344

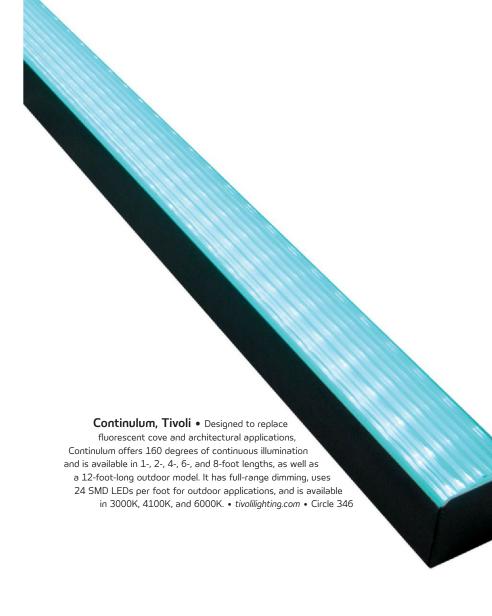




OUTDOOR archlighting.com 67



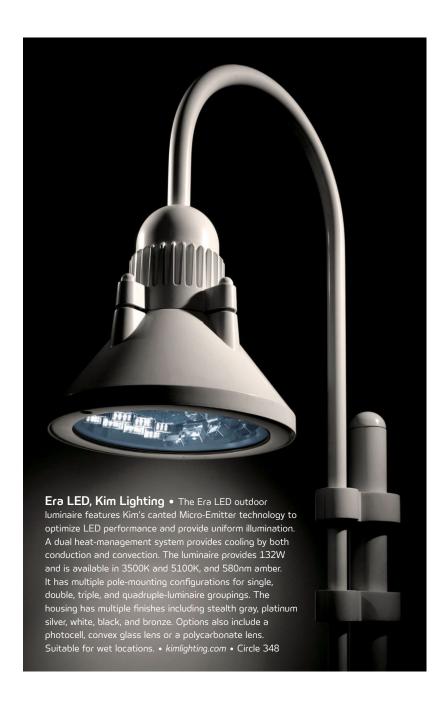
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**Designer LED Floodlight, Philips Gardco** • The line of floodlights from Philips Gardco is designed specifically for advanced LED arrays. It is available in 3000K, 4000K, and 5700K, and six optical distributions. Integral thermal fins dissipate the heat. IP66-rated. UL-listed for wet locations. • sitelighting.com • Circle 347

**OUTDOOR** 



**PureForm, Philips Garcdo** • The PureForm LED fixture head, which can be pole or wall mounted, combines a sophisticated aesthetic with high performance in a profile less than 3 inches. It is available in four styles: a 9-inch standard mount, a 5-inch short arm mount, a decorative arm mount, and a mast arm mount. It has a lumen output range from 4,000 to 25,000 lumens, and is available in 3000K, 4000K, and 5700K in a wattage range of 55W to 130W. Finish paint options include: bronze, black, white, or natural aluminum. IP66-rated. UL-listed for wet locations. • *sitelighting.com* • Circle 349





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#### High Ceiling 112W LED Platform,

**Meteor** • Designed to replace incandescent and metal halide light sources in commercial and industrial settings such as warehouses, gymnasiums, shopping malls, and airports, the luminaire features a low-profile and lightweight design. The aluminum housing measures 16.5 inches in diameter by 17 inches tall. The circular 112W LED array uses LEDs from Cree and is available in three color temperatures—3000K, 4000K, and 5000K—with a minimum CRI of 75. (A CRI of 85 is also an option.) The fixture supports three beam angles—26, 50, and 80 degrees. The luminaire is dimmable, UL-listed, and meets LM-79 and LM-80 standards. A 140W model recently has been added to the line. • meteor-lighting.com • Circle 351



#### Essentials Bay Series, Lusio Solid-State Lighting • The

Essentials Bay Series family of luminaires is available in two-, four-, and six-LED modules, as well as two-, four-, and six-short LED modules. The two-LED  $\,$ module version (shown) measures 44  $^{1}$ /8 inches long by 12  $^{1}$ /8 inches deep by 2 inches high, and the housing is finished in a white powdercoat. The fixture lens is a high-transmissivity UV-stabilized clear acrylic. A baffle option is available for glare control. The fixture uses 120W and is available in two color temperatures—neutral-white (4000K) and cool-white (5000K)—with a CRI of 70. Three mounting options are offered: suspension cable, surface mount, and rigid stem. The luminaire is also UL-listed for dry and damp locations. • lusiolighting.com • Circle 350

#### Proteon LED High Bay, Lithonia Lighting, Acuity Brands •

The Proteon LED High Bay is designed to replace high-intensity discharge, fluorescent, and induction high-bay luminaires in industrial settings such as manufacturing facilities, warehouses, cold storage, commercial, and largescale indoor spaces that require mounting heights from 15 to 40 feet and  $\,$ temperature ranges from between 13 F below zero to 131 F. An aluminum extruded heat sink provides thermal management. Focus, narrow, wide, and spread lens distributions are available for both horizontal and vertical light-



illumination in a variety of lumen packages. It also delivers longer life, which means increased savings and reduced maintenance.

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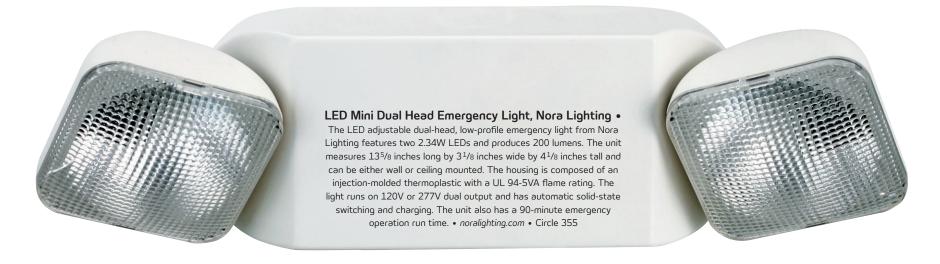
# **EXIT/EMERGENCY**



Exitronix Revolution, Barron Lighting Group • Revolution is a compact exit combo-unit with an adjustable LED lightbar. The sign measures 12.6 inches wide by 9.1 inches (to the top of the mounting plate). The sign depth is 1.9 inches and the ceiling mounting plate is 4.3 inches wide. The exit face is available in either red or green high-intensity LEDs that provide up to 90 minutes of run time. The housing is composed of injection-molded, UL94 V-0 flame-rated, high-impact thermoplastic in either white or black. The sign is UL-listed for damp locations • barronltg.com • Circle 353

Freelite, Fulham Co. • This family of photoluminescent exit signs does not require any electrical power for operation other than the amount of ambient light normally found in a building. The sign absorbs light, and then, when the lights go out due to loss of power, the self-illuminating material shines. The signs are available in 50-, 75-, and 100-foot viewing distances, with either single or dual faces. Background color options are: green, red, white, or black. Frame colors are: black, green, red, silver powdercoat, white, or no frame. The signs meet low-location egress requirements, are non-radioactive (Tritium-free), and fully recyclable. • fulham.com • Circle 354







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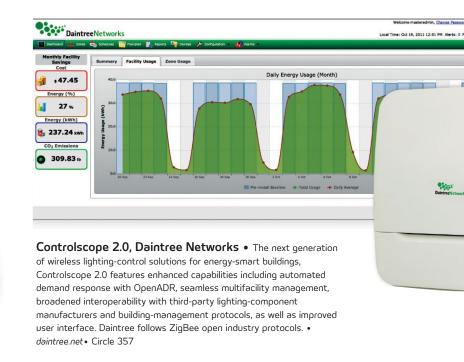






# LAMPS, BALLASTS, AND CONTROLS

A19 450 Series, Toshiba International Corp. • The 450 Series A19 direct-replacement lamp for 40W incandescents provides omnidirectional light and is dimmable. The 2700K version has a CRI of 81, uses 8.4W, and has a lumen package of 450. The 4000K version has a CRI of 82, also uses 8.4W, and has a lumen package of 500. The lamp is manufactured to Energy Star performance levels and is currently undergoing Energy Star testing. • toshiba.com/lighting • Circle 356





Essential MR16 LED Narrow Flood 2700K Lamp, Soraa • Part of Soraa's family of replacement lamps, the Essential MR16 LED Narrow Flood 2700K is designed to match the performance of a 40W MR16 halogen. The Soraa lamp has a color temperature of 2700K, a CRI of 80, a 24-degree beam angle, and uses 10.5W. It works with magnetic and electronic transformers and dimmers. It is UL- and CUL-listed, and rated for dry locations only. • soraa.com • Circle 358



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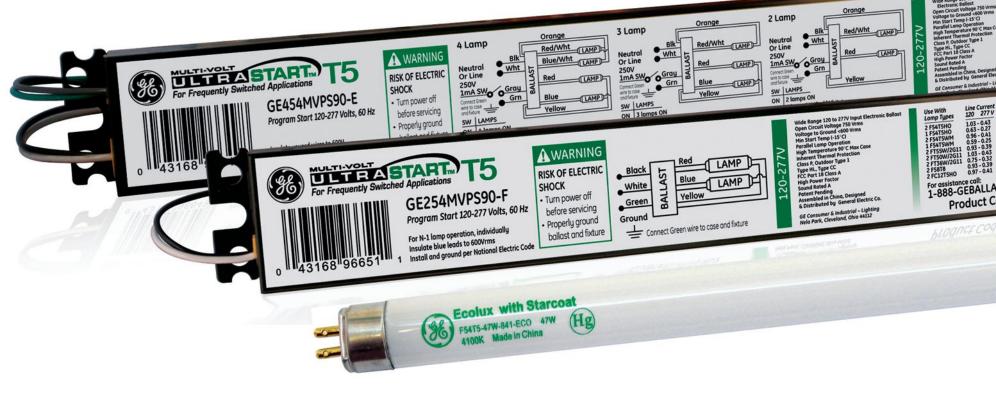
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From cool white to warm white, Verbatim LED lighting will soon have everyone seeing green.







Acculamp S-Series LED Lamp, Acuity Brands • The new family of first-ever LED lamp offerings from Acuity Brands provides a full range of replacement lamps from MR16 to AR111 to PAR20, PAR30, and PAR38. Intended for both commercial and institutional applications, the Acculamp line is the result of a business collaboration between Acuity and Neonlite Electronic & Lighting. The 15W AR111 lamp (shown) is offered in color temperatures of 2800K with a CRI of 82 and 4000K with a CRI of 85. It also has three beam angles: 8, 24, and 45 degrees. The high-quality cast-aluminum housing acts as the heat sink. • acuitybrands.com • Circle 359



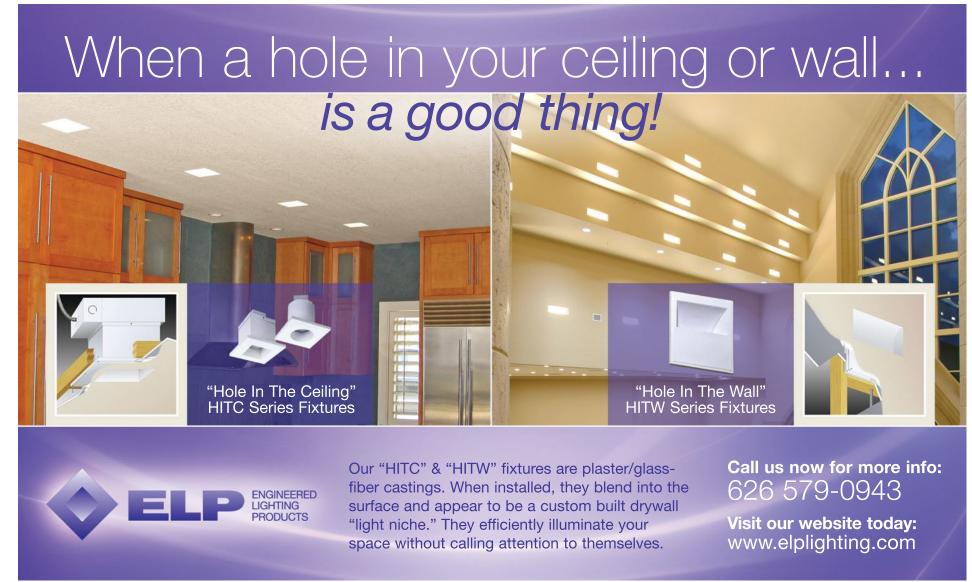
**Super Pulse-Start Long-Life, Venture Lighting** • A new metal halide lamp offering from Venture was one of three new debuts at Lightfair 2011 that included the Uni-Form SPC (Ceramic), the SPL (Long-Life, shown), and the SPE (Electronic) line. The SPL lamp, with two quartz metal halide arc tubes in each lamp now has a 40,000-hour life, enables an entire relamp cycle to be skipped, and cuts the hot restrike time in half. Wattages start at 70 and go up to 575. • venturelighting.com • Circle 360



#### T5HO 47W UltraStart Watt-Miser System, GE Lighting •

Designed for high-ceiling applications in commercial and industrial settings, the T5HO 47W UltraStart Watt-Miser System is best suited for high-bay or commercial troffer installations. A four-lamp system consumes 202W and delivers 95 lumens per watt, a 13 percent energy savings when compared to a 54W T5 system. The lamps are rated for 30,000 hours on a three-hour operating cycle. GE's UltraStart T5 ballasts operate the lamps in parallel mode, which keeps some lamps functioning when others fail. Additionally, the system is UL-certified to operate up to 55 C (131 F). •

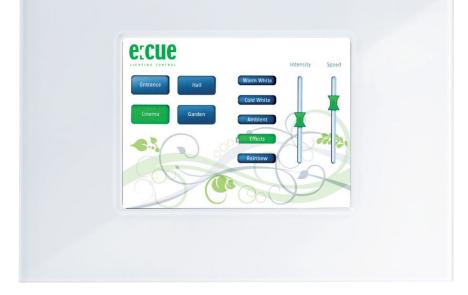






**Ultra LED A-line Lamps, Osram Sylvania** • The new omnidirectional LED A-lamp is the latest addition to Osram Sylvania's Ultra High Performance Series. It is dimmable and available in three low-power wattages: 8W (40W replacement), 12W (60W replacement), and 14W (75W replacement), each with a color temperature of 2700K and a CRI of 85. According to the manufacturer, the lamps provide up to 82 percent energy savings. • *sylvania.com* • Circle 364

FSP-211 Digital High/Low Passive Infrared Fixture Integrated Outdoor Sensor, WattStopper • The new sensor system from WattStopper is designed to be used in parking facilities, gas stations, pedestrian pathways, and warehouse applications. It is also engineered for use in LED fixtures, and can withstand the high temperatures of solid-state lighting. The sensor mounts in a luminaire and provides motion-based multilevel control. Control parameters can be easily customized for different projects to marry energy savings and security monitoring. • wattstopper.com • Circle 366



**Glass Touchscreens, Traxon e:cue** • The fully customizable graphical user interface from Traxon e:cue is triggered by touch and used for controlling lighting sequences and shows that run on e:cue engines using a two-wire e:bus or Ethernet connection. The wall-mounted, 5.7-inch touch panel features a frame in black or white with a simple magnetic attachment for easy cleaning and maintenance. • traxontechnologies.com; ecue.com • Circle 363







#### U-LED. Ushio America •

U-LED is a new LED candle and globe lamp designed to match the appearance of incandescent filament lamps. Maintaining the shape and appearance of an incandescent candlabra lamp base (E12), U-LED has no visible circuit boards or chips. The clear glass lamps consume less than 1W of energy and have a life rating of 40,000 hours, according to the manufacturer. • ushio.com • Circle 367

Sirius HRI Lamp, Osram Display/Optic • The Sirius HRI family of compact reflector lamps is designed for high-performance entertainment lighting and creates bright light for lighting effects. It is available in a 280W, 7500K, 72 CRI version, and a 230W, 8000K, 75 CRI version. The lamp, developed for small, moving fixture heads, measures 2.26 inches tall by 2 inches wide and uses P-VIP technology with optimized burner for every burner position. The system also includes an optimized electronic ballast. • sylvania.com • Circle 368

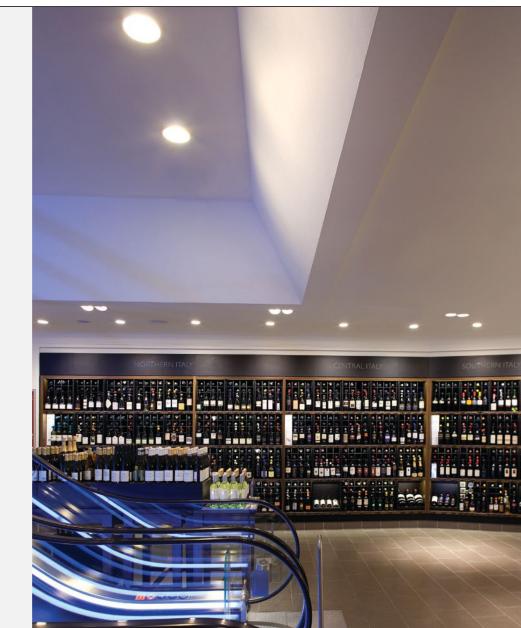
Whitegoods' architectural lighting system has been designed to offer the most discreet lighting solution to architects, designers and lighting consultants.

Products range from: round and square, downlights and washlights, continuous linear – all in matching apertures of 2", 4" and 6" to knife edge profiles, cove systems, large panels and tailored and custom solutions.

#### whitegoods

whitegoods.com inter-lux.com/whitegoods3

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#### Green Light Integrated Lighting System, Crestron Electronics • The Green

Light system is designed as a standalone lighting controller for classrooms, conference rooms, and offices. It can control four to eight channels of dimmable or switched fluorescent loads. Each unit can control a single room or up to four independent rooms. The system also has a real-time powerconsumption tracking option and direct connectivity to the company's Room View software. Lights are automatically shut off and HVAC adjusted in unoccupied areas. A report-generation feature provides users with synthesized data. • crestron.com • Circle 369



PAR20 and PAR30 Replacement Lamps, Nexxus Lighting • The PAR20 and PAR30 Replacement Lamps are two new additions to Nexxus Lighting's Array suite of LED replacement lamps. Both lamps are fully dimmable. The PAR30 is the equivalent of a 75W halogen lamp and the PAR20 (shown) is the equivalent of a 50W halogen. Both replacement lamps use 7W and are available in 2700K and 3000Kwith spot, accent, and flood beam spreads. The lamps are well-suited for tracklighting, spotlighting and many other accent-lighting applications. • nexxuslighting.com • Circle 370

Whitegoods' architectural lighting system has been designed to offer the most discreet lighting solution to architects, designers and lighting consultants.

Products range from: round and square, downlights and washlights, continuous linear - all in matching apertures of 2", 4" and 6" to knife edge profiles, cove systems, large panels and tailored and custom solutions.

#### whitegoods

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# Notes from an ANGRY DAND SCIENTIST!

Here's a short list of stuff that just hacks me off!

- 1. Editors that quote "experts" who failed in a field rather than those they know have successful products and businesses (like me).
- 2. People who listen to those editors.
- 3. Those who think that government regulations can fix things. (Over and over, history has proved that Ringo Starr had it right, "Whatever the government touches turns to crap!")
- 4. People who think everyone else is too dumb to know what is practical, cost effective, or really works. (See #3 above)
- 5. Folks who blather about "Dark Sky Initiatives" and energy saving then light up the outside of buildings and bridges.
- 6. People who leave lighting design until last.
- 7. Lousy 90-day warranties.
- 8. People who think its a good idea to trade a few watts of hugely inconsistent daylight for a zillon watts of HVAC.
- 9. "5-degree" beams that scatter light over 170+ degrees.
- 10. "IR Free" LEDs with complicated cooling fins, fans, 140° F exhausts and "no enclosure" instructions.
- 11. People who preach energy savings and R-values and then design glass buildings. (Terrariums are for plants, not people.)
- 12. Ugly lights.

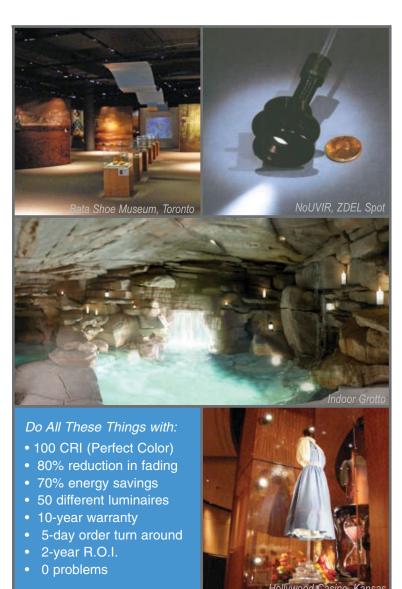
Jack Miller is our resident rocket scientist. (From Explorer and Voyager to hydrogen bomb tests and military grade laser systems, Dr. Miller worked on it). Co-founder of NoUVIR Lighting, Dr. Miller has a PhD in quantum physics and is a member immeritus of the IESNA. Dr. Miller's 136+ US patents include the saturation start ballast, the first commercially marketed CFL and, of course, the NoUVIR line of UV and IR free, pure-white, stone-cold, fiber optic lighting. Share your thoughts with Jack at jack@nouvir.com or buy your own ad!

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# LEDs and Drivers

#### RGB Color-Changing LED Tape Light, Nora Lighting •

Designed for discreet installations, such as in coves or within displays or wall features, Nora Lighting's Tape Light measures  $^9/16$  inch wide by  $^1/16$  inch thick. It includes the primary LED colors—red, green, and blue—plus a variant of tones. Nine LEDs per foot line the tape, measuring 2.5W per foot. The Tape Light can be programmed to run as a single color or as a series of rotating colors. It is available in 12V and 24V DC, and features an auto-changing fade or strobe for light shows. A standard roll size is 16 feet long. • noralighting.com • Circle 371

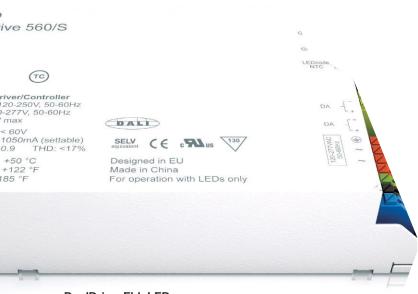


**Lumenbeam LBX Pendant, Lumenpulse •** The Lumenbeam family of RGB, white, and static-color LED pendants features a die-cast aluminum housing, stainless steel hardware, silicone sealing devices, a clear-tempered glass lens, a patent-pending dual chamber design for heat management and easy maintenance, and a powdercoat finish. Snoot, visor, and linear spread lens accessories are also available. The luminaire provides a minimum of 15 footcandles, and has DMX and DALI dimming options depending on the model. • *lumenpulse.com* • Circle 372



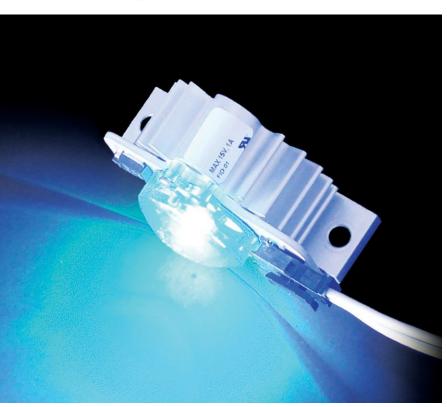
#### Lumière Next Generation LED MR16 Module, Cooper Lighting •

Lumière's LED module upgrade provides improved lumen output and efficiency and also offers a high (10W) and low (6W) option. Illumination levels are set in the field with a side switch. The module is fully dimmable, available in four color temperatures (2700K, 3000K, 4000K, and 5700K) and three beam spreads (12, 21, and 41 degrees). The module is compatible with more than 20 Lumière fixtures including a full range of accent, flood, inground, wall, sign, and underwater luminaires. • cooperlighting.com • Circle 373



**DualDrive, EldoLED** • The DualDrive is one of three new drivers in EldoLED's 50W LED driver AC series. The DualDrive features two separately controllable LED outputs and is well-suited for luminaire installations for applications such as office lighting, tunable white lighting, and retail display lighting. DualDrive is zero-to-10V, DMX/RDM, and DALI compatible, and provides dimming down to 0.1 percent brightness. It is also programmable and is ready for LED code-based feature extensions. • eldoled.com • Circle 374

FLS Fiber-Optic LED System, Ushio America • The FLS system is designed for lighting applications such as sign backlighting, channel letters, covelighting, and cabinet and display lighting that presently use neon and fluorescent tubes. FLS uses a combination of a high-powered LED (6500K, CRI of 75) and a fiber-optic cable to provide 360 degrees of even illumination. Maximum run length is 6 feet. It is UL-listed and has a Class 2 rating approved for wet, dry, and damp locations. • ushio.com • Circle 375





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Eclipse, Maxlite • This 16W dimmable LED, low-profile PAR40 replacement for spotlighting applications has a 45-degree beam angle and is available in 2700K, 4000K, and 5000K. It meets LM-80 industry standards, and is meant to be an alternate to 75W incandescents. The module body, which measures 5 inches in diameter, is composed of solid aluminum and serves as the heat sink. The lamp depth changes depending on the socket type, GU24 pin base or an E26 base, to 2.8 inches and 3.8 inches, respectively. Unlike other PAR lamp replacements that position the driver below the light source, Maxlite uses Component Isolation Technology so that the driver is positioned mid light-engine allowing it to sustain cooler temperatures while remaining separate from the LED light source. • maxlite.com • Circle 378



Next Generation LED LightBAR System, Cooper Lighting • Designed for use in both new construction and retrofit applications, the next generation LightBAR is available in two versions (seven LEDs and 21 LEDs), three color temperatures (3000K, 4000K, and 6000K), and 13 optical distributions. The LED LightBAR System features Cooper Lighting's patented AccuLED optics. The next-generation system is designed to be backwards compatible and future proof; there are no changes to the driver or the heat sink. • cooperlighting.com • Circle 379





PrevaLED Lighting Component System, Osram Sylvania • The new PrevaLED directional-light modular system is designed for the present and the future as solid-state lighting technology continues to evolve. One of the PrevaLED's features is a high CRI (of more than 90) at both 3000K and 4000K, as well as 11W, 28W, 35W, 38W, and 43W options. The system also controls light output to reduce visual variation between single light engines. The 2-inch round modules are available in lumen packages of 800 to 3,000, and all light engines have the same dimensions regardless of lumen package. The module has a wide beam angle (130 degrees) for use with reflectors. • osramsylvania.com • Circle 380

Universal LED Module (ULM), Whitegoods • In keeping with Whitegood's philosophy of flexibility and seamless integration, the Universal LED Module is equipped with a Whitegoods-developed heat sink. The module also works with light engines from a variety of manufacturers including Xicato, Bridgelux, Philips Fortimo, and Osram Sylvania's PrevaLED. The ULM insert can also be replaced or upgraded without changing the entire luminaire, and it works with Whitegoods's existing line of downlight and wallwash frames. • inter-lux.com/manufacturer/whitegoods • Circle 381



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# **APPS**





#### Mobile Pro Control, Crestron Electronics • By turning mobile devices into a Crestron Electronics touchscreen, the Mobile Pro Control app allows users to control a range of building systems, including lighting, heating and cooling, audiovisual, and security. It can display room temperatures, shade positions, and lighting levels, as well as stream live video from Web-based security cameras. An open platform allows developers to customize Crestron controls and touchscreen interfaces, which can be transferred to mobile devices. The app is available for use on iPhone, iPad, and Android devices. • crestron.com • Circle 382



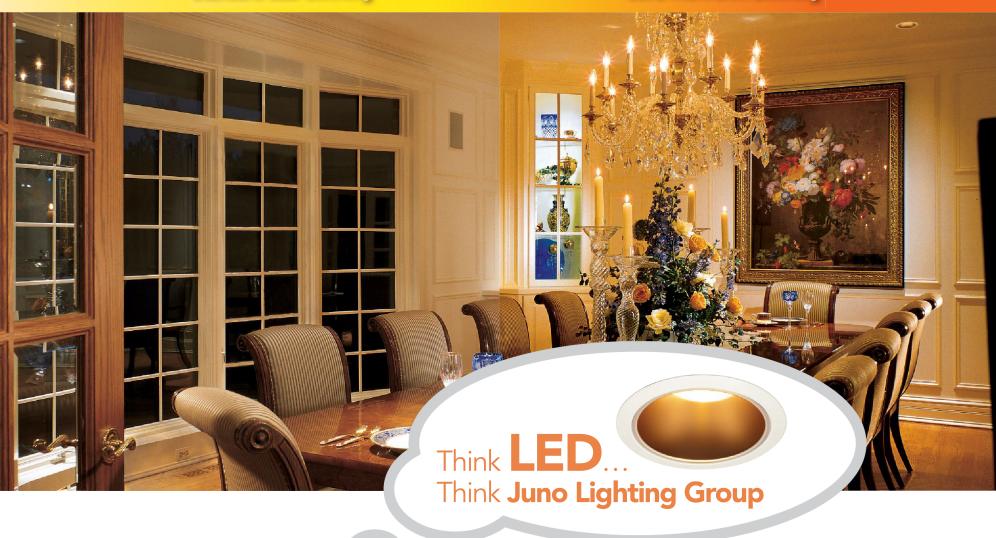
Venergy Advanced Metering System, Cooper Controls • The Venergy Advanced Metering System app displays the real-time energy usage of an entire building or its subcomponents, such as individual rooms or circuits. Using data collected by the Cooper Controls Advanced Metering System, the app expresses consumption by electrical and non-electrical building loads such as lighting, HVAC, and photovoltaic systems in dollars or in carbon dioxide emissions. Information is updated every minute, and an archive of energy usage is also kept available. The app is available for the iPad, iPhone, and Sony Dash. • coopercontrol.com • Circle 383

**LightMeter, Whitegoods** • As its name suggests, the LightMeter turns mobile devices into portable light meters. Using the readings, the app will also suggest scenarios—such as "ideal for reading printed paper of high contrast"—for which the measured light levels are well suited. Measurements update in real time and can be displayed in footcandles or lux. Readings can also be fixed for delayed viewing. Whitegoods offers the app for the iPhone, iPad, and iPod Touch. • inter-lux.com/manufacturer/whitegoods • Circle 384



**Standard LED dimming** 

**Juno WarmDim dimming** 



# Think WarmDim™ technology

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# **SPECIALTY**



Glass • Anti-Reflective Glass for Lighting, Guardian Glass • Guardian's Anti-Reflective Glass for Lighting features a multilayer, sputtered antireflective coating (single-sided or double-sided) that is applied to Guardian's own glass (available from 2mm to 6mm) for high transmission and low reflectance. It can be used for a variety of lighting applications including sports lighting, area- and floodlighting, and roadway lighting. • guardian.com • Circle 385



Optics • Specular Planar Reflector, Sentry Electric • The Specular Planar Reflector (SPR) optical system is designed to deliver light from an LED source in an indirect and asymmetric pattern to eliminate the harsh glare often associated with solid-state lighting. The optical system is available in all of Sentry's tulip-style luminaires, which are designed for streetlighting, area lighting, and architectural applications. The SPR system is specifically designed with Philips's Fortimo HBM LED module in mind. The modules are available in three color temperatures-4000K, 4100K, and 5700K. • sentrylighting.com • Circle 386



#### Sources • Light Emitting Capacitor Panels, Ceelite Technologies •

Ceelite's Light Emitting Capacitor technology is incorporated into thin (1mm thick), flexible, and lightweight panels that can be used on flat or curved surfaces for architectural and signage applications. Available in standard sizes and shapes up to 18 square feet, the technology is different from LEDs and OLEDs, according to the manufacturer, because it provides an even illumination surface in a single-pixel format without multiple points of electrical connection. • ceelite.com • Circle 387

### A Moment In Life Lighting







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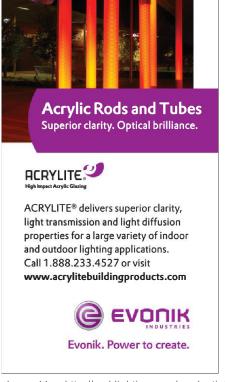
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#### **Let's Bounce**

When does best practices call for bouncing LED light off of a reflector instead of sending it through a lens or refractor?



WHITE PAPER
A recent white paper
by Eneref Institute
discusses reflective
systems as an
alternative to lenses,
to shield the LED light
source, as a solution to
glare. The white paper
is available on the
reports page of:
www.eneref.org

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Plā outdoor wall-mounted product allows specifiers to use one design vocabulary to achieve lighting suitable for the main entry, secondary entrances and the architectural façade. The LED optics are fully luminous, luminous/performance (Pencil beam, 30 degrees or 50 degrees) or performance/performance. 30 and 50 degree beams are field interchangeable.



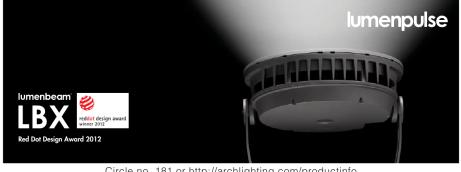
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Brand new: A series of intriguing shadecloths developed with architect William McDonough and directly derived by his photographs of Iceland. This PVC-free shadecloth is Cradle to Cradle Certified<sup>CM</sup> and can be reclaimed and recycled indefinitely. Available in four standard patterns and 16 colorways. Custom colors in small minimum orders are available.

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#### GlacialLight is pleased to announce the addition of a 6-inch TRIAC-dimmable LED down light — GL-DL06D - Capella Series.



GlacialLight

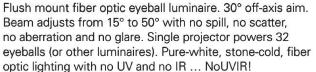
GlacialTech Inc. Tel: +886 2 2244-1227 Fax: +886 2 2244-1228 sales@glacialtech.com www.GlacialTech.com

The Capella Series has proven to be a high-quality, energy-conscience solution for indoor commercial and residential down lights. With the introduction of the GL-DL06D, GlacialLight's down lights can now be used in TRIAC dimmable light applications.

This Capella Series 6-inch LED dimmable down light consume only 12W- much less energy than traditional down lights. With no perceptible flickering, the GL-DL06D shines easy-on-the-eyes light for a minimum of 30,000 hours. If used for eight hours a day, the GL-DL06D would produce evenly distributed light for over a decade without a need for replacement.

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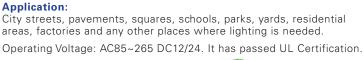
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imported LED driver.

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ArchiPoint iColor Powercore is a daylight-visible, exterior-rated LED pixel ideally suited for a range of direct-view applications as well as accent applications such as path and marker lighting. These versatile lowprofile fixtures output over 7,000 nits of intelligent color light for large-scale video, effects, and other direct-view applications



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e • poc® LED combines the highly popular e•poc® full distribution luminaire with advanced solid state electronics from Universal Lighting

Technologies. Its high-efficacy, energy savings, long life, and sustainability make it a great choice for the general illumination market.

http://www.columbialighting.com/products/lepc/

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**LumeLEX 2030 Series** 

For more information on the

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traditional low voltage halogen source.

LumeLEX 2030 Series, please visit: www.LightingServicesInc.com

#### Times Square Lighting's 36.3W, 2000 Lumen LED Fixture

The X20 from Times Square Lighting is designed around the Xicato $^{\rm TM}$  LED remote phosphor module. This module produces an even field of illumination for the most demanding applications. The X20 is ideal for museum and retail lighting where a low-wattage, high-output LED fixture would be required.

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CREDIT: 1 GBCI CMP hour, LEED Specific BD+C and 1 AIA HSW/SD hour

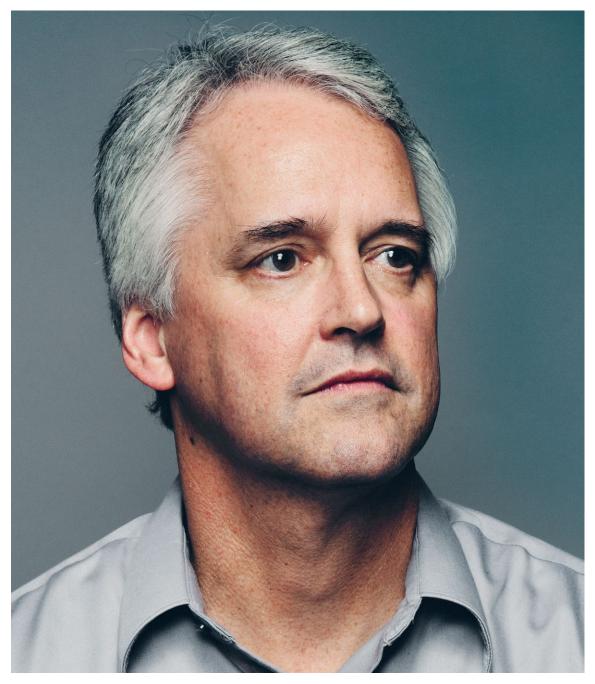
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# Robert Davis

interview by Elizabeth Donoff photo by Bob O'Connor

96

"When it comes to innovation in lighting, I am a firm believer in Occam's razor—that the simplest solution is usually the best. The innovations that impress me the most in lighting are those where a designer or a design team creates a wonderful architectural environment using just a few basic pieces of lighting equipment. Especially when some of the equipment is used in new ways, or in ways that we [the manufacturer] did not anticipate when developing the product."

While working in lighting for close to 30 years first in industry, then in academia, and now back in industry—teaching has always been the constant in Bob Davis's approach to architectural lighting. His father, an electrical engineer, inspired him early on, and so Davis pursued a suite of mechanical drafting courses during high school, all the while his sights set on Penn State and its architectural engineering program. But once there, the scholarly passion for lighting, exhibited by teachers such as John Flynn and Gary Steffy, convinced Davis to pursue lighting as his specialty within engineering. It has been this same passion to which Davis has held true throughout his career, whether teaching in academic settings such as the lighting program at the University of Colorado at Boulder, completing his doctorate in cognitive psychology in 2006 at the age of 46, or developing new luminaire designs, as he does in his present position as director of product innovation and marketing at Hanson, Mass.based lighting manufacturer Litecontrol.

#### What fascinates you about light?

How much we don't know. There's still so much to learn about how light affects us psychologically and perceptually. We continue to learn new things about topics that we thought we had already figured out.

What are some of the distinctions between working on lighting in an academic setting versus a business one? Whether it's in academia or in industry, there's always a huge need for education in lighting. I do as much or more teaching now [at Litecontrol] as I did when I was at Colorado. The biggest differences, though, are the stresses, and life and time demands; fewer in academia.

Are there different expectations for teaching lighting in an academic setting versus a non-academic setting? Whenever you work with a team of engineers or undergraduate engineering students, you can go pretty deep. But in the corporate world, that is pretty unusual. I'm always trying to figure out how I can take very technical material and make it understandable to people who may not have an in-depth technical background.

#### How has the business of lighting changed since you first entered the field?

The most positive changes have been in information and communication technology. The ease with which we can now do things that used to be laborious is amazing. The greatest negative changes have been the acquisition and, in many cases, the demolition of family businesses that were providing most of the new innovations in lighting equipment. Along with that has been the packaging of lines at rep agencies, and how difficult it has become for a designer to get the solution that he or she really wants for a project.

What makes a great piece of lighting equipment? One that accomplishes the architectural purpose without drawing attention to itself.

Are you designing luminaires with the potential for some kind of modification or customization in mind? Yes. It's one of the things that has allowed us to withstand the economic downturn and continue to compete with much larger companies.

Does sustainability factor into the lighting discussion? A casualty of the economic downturn has been any serious conversation about sustainability and lighting. Right now, sustainability in lighting has been reduced to 1970s-style energy-conservation efforts with little thought about the quality of the environments we create.

AL May 2012 ONE-ON-ONE



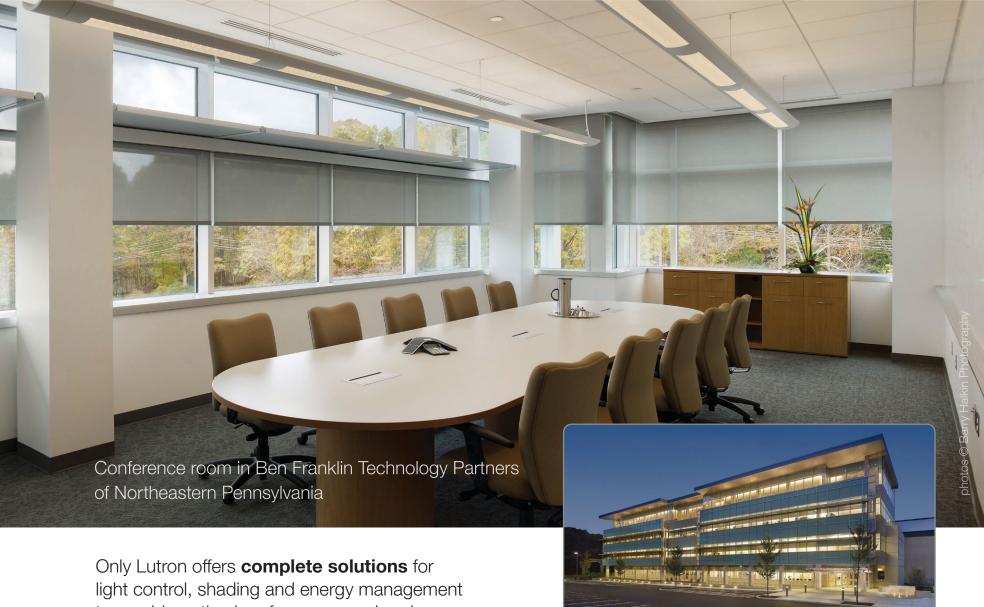
#### We're celebrating our first quindecennial!

OK, we know that a 15-year anniversary doesn't exactly have the gravity of a Golden Jubilee. But in the world of LED lighting, 15 years is a lifetime. In fact, Philips Color Kinetics presided over the birth of the LED lighting industry, way back in 1997. We invented the method that enables color-changing illumination by LED light sources, a groundbreaking line-voltage power management system, and dozens of other innovative LED lighting technologies. With over 34,000 proven, transformative solutions in countries all over the world, Philips Color Kinetics stands ready to lead the LED lighting revolution for the next 15 years and beyond. So here's to you, lighting professionals. We'll be looking for you at our trigentennial.



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