



**EPIC Members Event Report**  
**LIGHTFAIR International – LFI 2013**

Philadelphia, USA

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[www.lightfair.com](http://www.lightfair.com)

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**About the EPIC Members Event Reports**

Initiated by the founder of EPIC Dr. Thomas Pearsall in 2003, these reports are prepared by members of EPIC to the benefit of the wider community. If you did not have a chance to attend the event but would like to know some key highlight, this report is for you. Emphasis is placed on exploring technical and business opportunities for the members of EPIC. If you are an event organizer and would like your event covered by EPIC, if you would like to volunteer for writing a report, or if you have any comments to this report, please contact [info@epic-assoc.com](mailto:info@epic-assoc.com)



## Introduction: LFI 2013

LIGHTFAIR® International (LFI) is one of the most important events for the lighting industry, connecting state-of-the-art technologies, innovative design, cutting-edge style, networking opportunities and education courses. More than 500 manufacturers presented products in the field of light sources, lighting systems, day lighting products, decorative lighting, ballasts, fixtures, lamp-holders, luminaires, lighting control components, sensors, control devices and mounting devices.

## LFI Conference 2013

Many courses, workshops and seminars were offered to educate attendees on the industry's latest trends, innovations and solutions in the field of lighting technologies.

Most of the courses and talks were focused on LED technologies and their implementation, especially in commercial, industrial and outdoor lighting applications: large strides have been made in improving efficiency, lumen output and colour quality of LED lights. As illustrated by James Benya, teacher of lighting design, PE, FIES and IALD, during the workshop "Using LEDs for directional and display lighting", performances of the best LEDs are now comparable or even better with respect to those of good discharge lamps, lifetime is longer, but costs per klumen are still higher (see figure).

During the Conference, in several occasions, as for example in the workshops "There is No Such Thing as One Perfect Lighting System" (by Gerry Cornwell, Peping Dee Jr., Benjamin Koyle, David Weigand) and "What's New in Lamps & Ballasts - Light Sources Update" (by Craig Di Louie, Stan Walerczyk, Howard Wolfman), it was emphasized that Solid State Lighting has high potentialities in many lighting sectors, but in general it is important to select the proper light source according to application needs and LEDs are not always the best solution. Gerry Cornwell, one of the

leading lighting designers in Canada from GC Lighting, underlined that *"each lighting technology has strengths and weaknesses, applications where it works brilliantly, and others where it struggles; the danger of having only one lighting tool in your designer's toolbox is that you confine yourself within the constraints of that particular box; thinking «outside the box» is what designers must attempt in order to provide the best solutions"*.

Qualities of LEDs relative to Other Lighting Technologies							
Source	Efficacy (LPW)	Life (hours)	Color CCT range and CRI	Optical abilities	Cost per klumen	Start up and dimming	Flexibility
Incandescent	10-20	750	2700K 100 CRI	Great	\$15	Great	Great
Halogen	15-25	4000	3000K 100 CRI	Great	\$20	Great	Great
Linear fluorescent	60-110	20K+	2700-17000K 70-95 CRI	Linear tube	\$20	Good indoors	Size issues
Compact fluorescent	30-50	5K-20K	2700-5000K 80 CRI	Blob	\$30	Color shift when dimmed	Size issues
Low wattage HID (CMH)	40-70	7.5K-15K	2700K-5000K 85 CRI	Point source	\$50-100	Warm up and no dimming	Good
Plasma	70-120	>50K	4100K, 70 CRI	Point source	\$50	Warm up and no dimming	Fair
LED Dedicated	50-100	>50K	2700-6500K 70-98 CRI	Point source, linear tube	\$200	Great	Great
LED replacement	40-80	>25K	2700-5000K 80-90 CRI	Point source, linear tube	\$50	Very good	Very good

Dedicated	Replacement
<ul style="list-style-type: none"> <li>Higher cost</li> <li>Better looking</li> <li>Greater range of options</li> <li>Better dimming</li> <li>Better cooling</li> <li>Classic accessorizing</li> </ul>	<ul style="list-style-type: none"> <li>Lower cost</li> <li>Traditional appearance</li> <li>Limited range of options</li> <li>Dimming limitations</li> <li>Questionable cooling</li> <li>How to accessorize</li> </ul>

LEDs versus other Lighting technologies

## A hot subject of the conference was the use of strategies for smart lighting management.

David Weigand from OSRAM Encelium described as effective light control can eliminate waste creating a productive and comfortable visual environment: automatic control systems, automatic multi-level lighting systems or dimming systems, shutoff systems, occupancy sensors and daylight sensors can significantly contribute to energy saving assuring "the right amount of light where it's needed and when it's needed".

Codes and regulations for lighting controls has been recently introduced: for example, the US Department of Energy recognized ANSI/ASHRAE/IES 90.1-2010 as new national energy standard to provide minimum requirements for the energy-efficient design of buildings except low-rise residential buildings (adoption by October 2013): main difference respect to the previous 90.1-2007 version is related to requests of lighting controls with specific requirements on daylight harvesting, automatic shutoff (with occupancy sensors mandated in a list of specific space types), bi-level lighting and space controls.

## LFI Trade Show and Exhibition

### The exhibition on light sources and lighting systems was arranged in six pavilions:

- the Building Integration Pavilion, showing solutions and products used to maximize and create energy-efficient buildings
- the Daylighting Pavilion focused on architectural daylighting, daylight harvesting, energy efficiency, solar shading and natural light
- the Design Pavilion, a showcase of modern and classic decorative designs
- the Roadway and Exterior lighting Pavilion offering solutions for various outdoor applications
- the Global Light + Design Pavilion displaying the finest decorative lighting designs from internationally recognized manufacturers
- the New Exhibitors Pavilion for first-time exhibitors from around the globe.

Exhibitors were companies from around the world and more than 20000 professional attendants registered to the event.



LFI exhibition: Daylighting Pavilion

## Main news from big players in the field are here summarized

**Samsung** chose LFI 2013 to assert its leadership position in LEDs, modules, and lighting products. The Korean company presented new SSL MR16 lamps, LED-based retrofit tubes for fluorescent fixtures, and new packaged LEDs and LED modules. Nam-Seong Cho, executive vice president and head of the LED business at Samsung Electronics, said, "We have taken the lead in product innovation." Specifically, Cho mentioned the recent announcement of the mid-power LM561B LEDs with efficacy of 160 lm/W (at 65 mA) and S-140 LED-based retrofit tubes that have 140 lm/W efficacy.



The new wireless ZigBee-based retrofit LED lamps with the launch of a starter kit, due in the third quarter, attracted a lot of interest:

the plan is to provide a starter kit that will include three wireless-enabled retrofit lamps and a ZigBee network bridge that will enable control via smartphones and other devices. The initial smart lights will offer the equivalent

light output of a 50W incandescent lamp and are rated for 25,000 hours life.

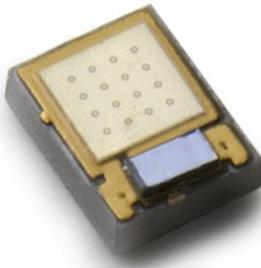
The starter kit seems to be similar to the Philips Hue personal wireless lighting, but it simply supports dimming and remote on-off control and does not include color-tuning capabilities, neither RGB tuning or tunable white CCTs.

Samsung expects a networked home opened by products including smartphones, intelligent Internet-enabled TVs: everything in the home connected ranging from kitchen appliances to lighting. In its booth, the company showed a living room with smart lighting, intelligent TV, a wireless-enabled front-door lock, connected air-conditioning system, and wireless occupancy sensors.

For packaged LEDs, Samsung announced COB (chip on board) systems with power up to 40W and efficacy of 129 lm/W (CRI of 80 or higher).

**Philips Lumileds** announced the Luxeon Z LED family available in compact dimensions (2.2 mm<sup>2</sup> micro-footprint) and with 1-step (and also 3-steps, or 5-steps) MacAdam ellipse bin.

Thanks to this high color control feature and to the small size the new products are interesting especially for MR16 retrofit lamps where a tight beam is required, but also for other retrofit-lamp applications



including A19, GU10, and BR30 and even for outdoor applications. These compact LEDs need smaller optics, so increasing flexibility and reducing costs. At 2700K warm-white efficacy is in the range 81-102 lm/W (350 mA of drive current). Cool-white efficacy is at a level of 129lm/W.

**GE Lighting** announced advanced lighting controls and network systems for street lighting. GE LightGrid technology can create network connectivity to every street light fixture and GPS receivers. In addition to energy

efficiency thanks to the control of the light level, advantages will come also with automated maintenance that will eliminate outages. The city of Los Angeles has already conducted a trial with GE and is moving to implement an extended pilot program. The wireless nodes will be installed in the lamp sockets where photocells are typically installed. Networked lights will communicate to gateways that serve many lights.

GE presented also LED retrofit lamps: new A19 LED lamps for 40W and 60W replacement in its Reveal-branded family with high color fidelity. Also this year fixtures with opaque light panels coupled with LED edge-lighting and a special MicroLens technology were shown. According to GE indications, each fixture will deliver uniform, bright light in a thin design with the following features:

- 90 lm/W
- CRI 80 +
- Life: 50000 hours



**Cree** presented the built on SC<sup>3</sup> Technology™ platform, XLamp XQ LEDs that combine small size (1,6x1,6mm<sup>2</sup>), reliability and novel light distribution:

- XQ-D LED: up to 130 LPW @ 1 W
- XQ-B LED: up to 160 LPW @ 0.18 W
- wide viewing angle: 140 – 145°
- 80, 85 and 90 CRI options available.

**Osram Opto Semiconductors** launched the mid-power LED Duris P5 in color. The new versions have high luminous efficacy from a compact form factor, already known from the white version. The LEDs are ideal for architectural lighting and for the hospitality sector (hotels and restaurants). The color

versions of Duris P5 are ideal for linear, area or omnidirectional lighting applications in which the light has to be distributed as uniformly as possible.

**Toshiba International Corporation** showed the TLS-DCA6 - TLS-DCA8 LED downlights, which offer a variety of lumen outputs (2800lm, 5500lm and 8500lm) suitable for high ceiling environments such as auditoriums shopping malls, atriums and concourses.

The availability of these new high lumen outputs products opens opportunities in fields where High Intensity discharge lamps are dominant.

Concerning conventional **Discharge Lamps** the biggest efforts from the producers were related mainly to the increase of lifetime (to better compete with LED lifetime) and to the improvement of lamp efficacies:

- **OSRAM Sylvania**, in addition to the awarded Octron 800 XP, 84000 hours T8 fluorescent lamps, presented also the LUMALUX PLUS XL ECOLOGIC High Pressure Sodium Lamps with power of 100W or 150W having impressive rated life of 80000h (and instant hot restrike features).
- **Venture Lighting** proposed the new RIO (Retrofit Integrated Optics) systems based on Ceramic Metal Halide retrofit lamp/ballast kit with integrated dichroic optics for roadway fixtures: efficacy up to 118 lm/W and rated life 30000 hours.
- **Eye Lighting International** showed CMT/HOR/837PS Ceramic Metal Halide lamps operated on a pulse start ballast with 30000h life and 95% maintained lumens at 120 lm/W.
- **VU1 Corporation** presented the Electron Stimulated Luminescence (ESL) Light bulb designed to replace a 65W equivalent incandescent R30 flood bulb for recessed light fixtures, with light quality indistinguishable from that of incandescent lamps (CRI 90+).

- **Luxim** presented Light Emitting Plasma lamps for high illuminance applications with lifetime up to 50000 hours.
- **Ceravision** announced High efficiency electrodeless plasma lamps with CRI up to 95+ for Street lighting or High Bay applications.

At LFI 2013 it was evident that, in addition to the continuous development of LED chips and structures, there is an increase of attention to optics and optical components in view of products differentiation and customization: the trend is driven by the need to create novel beam patterns, to shape the light according the applications or to obtain even illumination. In this field several companies presented interesting products:

- **Jungbecker** → lenses, lens arrays, light guiding prismatic plate, diffusers, prisms produced by sheet embossing technology or injection molding.
- **Kathod** → lenses, multi-lenses panels, diffusers, reflectors obtained by injection moulding.
- **Luminit** → surface diffusers, light shaping diffusers based on holographically mastered light diffusion technology.
- **Intematix** → well known producer of remote phosphors, they proposed silicone remote phosphor covers for LED bulbs and for linear LED modules.
- **LUXEXCEL** → inventor of the printoptical technology, LuxExcel showed 3D-printed lenses, lens combinations, color lenses, lens arrays, optics textures, micro optics, prism structures.

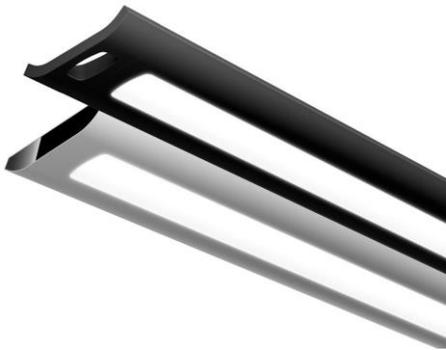
Materials (resins, plastics, metals) used for the optical components play an important role in their performances: Dow Corning, Bayer Material Science and Shinetsu presented at LFI resins, plastics, sheets, films and coatings with advanced performances for primary/secondary optics, transparent and diffused lenses/covers, reflector, housing and heat sink applications.

## LFI Innovation Awards 2013

As usual the LFI Innovation Awards program provided an overview of the latest lighting-related products and designs proposed by the manufacturers over the last 12 months. The awards program encompassed over 250 products for 15 different categories. Each product was judged by an independent panel of renowned lighting professionals. The winners were awarded for product entries that demonstrate the best in innovative concept and design.

The 2013 key award winners were:

- *winner of the AWARD FOR THE MOST INNOVATIVE PRODUCT OF THE YEAR* - the highest award, recognizing the most innovative product  
→ **BOLDPLAY by Philips:**



A LED luminaire delivering extraordinary performances (efficacy 106 lumen/W) and high energy saving.

- *Winner of the TECHNICAL INNOVATION AWARD* - award recognizing the most forward-thinking advancement in lighting technology → **MOLDABLE SILICONES by Dow Corning Corporation:**



Moldable silicones enabling complex shapes, micro-optical structures, big structures and even undercuts for special and flexible lighting.

- *Winner of the DESIGN EXCELLENCE AWARD* – award recognizing outstanding achievement in design → **LIGHT SHEET by Cooledge Lighting (received also the Award for best LED, OLED chip/modules):**



LED lighting system with width from 25 to 250 mm and length up to 2,4 m that combines mechanical, electrical and source functions together in a flexible sheet of light; high efficacy at 110 lm/W, white light CRI>80 and 50Khr life.

- *Winner of the JUDGES' CITATION AWARD* – recognition of innovative product at the judges' discretion → **HUE PERSONAL WIRELESS LIGHTING by Philips:**



Wireless RGB LED system controlled via smartphone or Ipad offering dimming, tunable white and dynamic color through a picture based interface.

Prizes provided in the most important categories were assigned as follows:

- Winner of the AWARD FOR CONVENTIONAL LAMPS → OCTRON 800XP XL SUPERSAVER T8 Fluorescent Lamps by Osram Sylvania



25 and 28 watt high performance T8 lamps with extended life up to 84000 hours.

- Winner of the AWARD FOR PARKING, ROADWAY AND AREA LUMINAIRES → EVOLVE LED SCALABLE COBRAHEAD ROADWAY LIGHTING by General Electric



Scalable LED Head offers hundreds of photometric combinations, reduced glare and high coefficient of utilization.

- Winner of the AWARD FOR CONTROLS, BUILDING INTEGRATION, SITE AUTOMATION AND DISTRIBUTION SYSTEMS → HBA WASP2 DIMMING OUTDOOR OCCUPANCY SENSOR by Hubbel Lighting Inc.



Dimming outdoor occupancy sensor providing 0-10 V DC output for the control of dimmable LED fixtures.

- Winner of the AWARD FOR BALLASTS AND TRANSFORMERS → HighHORSE CONTROLLABLE INDUCTION GENERATOR by Fulham Co., Inc.:



Controllable induction generator that supports multiple wattage lamps while it reports performances back to a user interface.



making **innovation happen**, together

### About SAES Group

A pioneer in the development of getter technology, the SAES® Group is the world leader in a variety of scientific and industrial applications where stringent vacuum conditions or ultra-pure gases are required. In more than 70 years of activity, the Group's getter solutions have been supporting innovation in the information display and lamp industries, in vacuum thermal insulation and in technologies spanning from sophisticated high vacuum systems to miniaturized silicon-based microelectronic and micromechanical devices. The Group also holds a leading position in ultra pure gas refinement for the semiconductor and other high-tech markets.

Starting in 2004, by leveraging the core competencies in special metallurgy and in the materials science, the SAES Group has expanded its business into the advanced material markets, in particular the market of shape memory alloys, a family of materials applied in the biomedical sector and for actuator devices in the industrial sector (domotics, white goods industry, consumer electronics and automotive sector). More recently, SAES has created new products used in OLEDs (Organic Light Emitting Diodes), both for displays and for lighting and in photovoltaic panels. [www.saesgetters.com](http://www.saesgetters.com)



### About EPIC – European Photonics Industry Consortium

EPIC is a membership-led not-for-profit industry association that promotes the sustainable development of organisations working in the field of photonics. Our members encompass the entire value chain from LED lighting, PV solar energy, Silicon photonics, Optical components, Lasers, Sensors, Displays, Projectors, Optic fiber, and other photonic related technologies. We foster a vibrant photonics ecosystem by maintaining a strong network and acting as a catalyst and facilitator for technological and commercial advancement.

### EPIC Members (1 May 2013)

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