

## FEATURED ARTICLE

# Promoting Safety in Electric Signs for Over 100 Years

By Joseph S Frederic / UL Principal Engineer

November 2017 will mark the 100th anniversary of the first publication of UL's safety standard for electric signs. While this is a significant milestone in itself, this anniversary highlights the enduring relationship UL has maintained with the sign industry.

There is evidence of UL certifying electric signs many years before the standard was published. The first historical evidence of sign certification appeared in a 1904 edition of the "Electrical List" that was a publication equivalent to today's Certification Directory. At the time, there were only a handful of certified signs. A generic description of each sign along with the name of their manufacturer appeared in the directory under the "Weatherproof" products category. It wasn't until 1907 that a separate category was established in the "Electrical List" for electric signs, signaling that a critical mass of products was being certified.

Evidence of UL's collaboration with the sign industry is mentioned in the first edition of the sign standard, which describes contributions from the "Industry Conference for Electric Signs," a body consisting of manufacturers and UL staff. Members of that industry conference were also involved in developing the installation requirements for electric signs, which made their first appearance in the 1911 edition of the National Electrical Code.

While the scope of the first edition of UL 48 was limited to signs made of metal enclosures with protruding incandescent lamps, the requirements remain largely relevant today for signs with similar construction features. Sheet metals

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## Spotlight: Letter From Roberto



*Are Quantum Dots the next technology to revolutionize our industry?*

*This technology is used primarily in the C-TECH/Hi-TECH segment and several manufacturers of tablets, mobile devices, and televisions already offer products with quantum dot-containing displays. In the lighting industry, we will start to see some product development in this area but, for commercialization and massive adoption, we will have to wait for a completely non-toxic Quantum dot technology and cost reduction, both of which are expected by 2025*

*We wrote a whitepaper that provides an overview on this technology, explaining how it works, the potential benefit it may offer and the possible impact in the lighting industry.*

You can download our white paper [here](#).

Kind Regards,



Roberto Inclinati  
Global Commercial Leader for  
the Lighting Industry



## Upcoming UL Education & Training for the Lighting Industry

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[Self-ballasted Lamps, UL 1993](#)

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[Low Voltage Lighting, UL 2108](#)

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## Brighter Lights on Global Safety: UL's Frankfurt Lighting Laboratory now a CBTL

On July 31st, UL announced that its Frankfurt Lighting laboratory has been designated as a Certification Body Test Laboratory (CBTL), which means that, along with offering testing and certifications services according to UL standards, this location can now offer testing and certifications services for lighting products according to IEC standards. Tests and certifications for the following IEC standards are now available: IEC 60598-1; IEC 60598-2-1; IEC 60598-2-2; IEC 60598-2-3; IEC 60598-2-4; IEC 60598-2-5; IEC 62031; IEC 61347-1; IEC 61347-2-13; IEC 62384. This is an important step to better serve lighting manufacturers in the DACH (Deutschland, Austria, Switzerland) region.

The availability of this larger spectrum of offerings is meant first of all to simplify the certification process for lighting products by streamlining the steps required for manufacturers in the DACH region to enter various global markets. This simplification increases both financial and process efficiency for local enterprises in a competitive market landscape.

Because products will be tested directly at the Frankfurt laboratory, samples will not need to be shipped to other UL labs. Manufacturers will benefit from the guidance of a local, dedicated German-speaking team of UL experts as their products are shepherded through a single certification

path. They will be able to test and certify one product not only according to UL standards (which offer access to North America), but also according to IEC standards to generate the CB test report, which is the key step to achieving any other country-specific mark.

“Germany, Austria and Switzerland are key countries for the European lighting industry. It is the preferred location for industry leaders which also means that this market is highly competitive,” said Roberto Inclinati, global commercial leader for UL’s lighting industry division.

“The Frankfurt Lab’s CBTL designation means that UL now offers more than just the option for lighting manufacturers to access the North American market – it now offers a pathway to all main markets globally. We are happy to grow here, to support our DACH region manufacturers locally and continue to develop as a vital partner for their success.”

**UL opened the doors of the Frankfurt CBTL on September 7 to all manufacturers, stakeholders, associations and friends who wanted to spend a full day exploring UL’s testing and certification expertise in the lighting space.**

## Luminaire Air Leakage: Stopping the Energy Villain

By Rich Berman / UL Senior Regulatory Engineer

In North America, we have benefitted from the emergence of some energy saving superheroes. As LED technology has quickly grown, energy use from lighting continues to decrease. But as adoption of energy efficient technologies has resulted in significant savings, the recessed luminaire air leakage villain continues to steal from us.

Energy loss from air leakage can be significant. Known as the chimney or stack effect, air will move through recessed luminaire seals, seams and other small openings when there is a temperature or pressure difference between conditioned and unconditioned spaces. Tiny holes or gaps equaling a 0.5 in. diameter opening can result in a loss of 2 cfm.

One of the drivers for energy conservation requirements is the Energy Conservation and Production Act (ECPA) enforced by the U.S. Department of Energy (<https://www.energycodes.gov/about/statutory-requirements>). The International Energy Conservation Code (IECC), the California Energy Commission (CEC) Building Energy Standards (Title 24, Part 6) and ASHRAE Standard 90.1 are designed to meet or exceed the requirements in the ECPA.

Code authorities are increasingly turning to these energy codes for guidance in reducing energy losses. According to the International Code Council (ICC), the IECC is currently in use in or adopted by 47 states, the District of Columbia, the U.S. Virgin Islands, New York City, and Puerto Rico. It is also the basis of many international energy conservation codes.

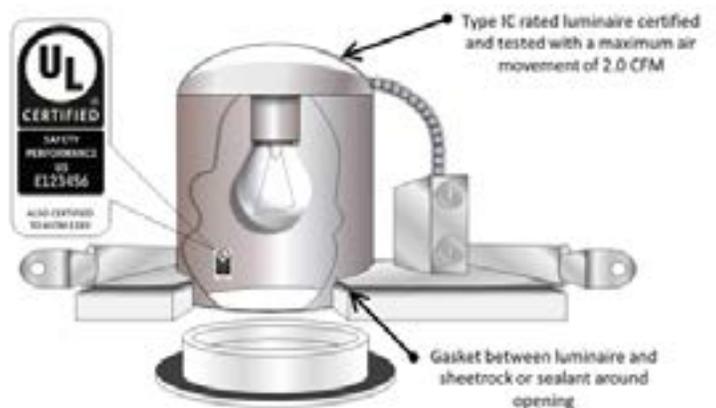
As required by California law, CEC Title 24 was enacted in 1978 by the California Building Standards Commission to reduce energy use and greenhouse gases. It applies to all building occupancies in California and covers 16 climate zones. The current edition is dated 2016 and is on a triennial revision cycle.

Both IECC and CEC Title 24 require recessed luminaires that penetrate the building (thermal) envelope to be Type IC-rated and bear a label that certifies that the luminaire does not permit air leakage in excess of 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E283 at a pressure differential of 1.57 psf (75 Pa).

**IECC Definition – Building Thermal Envelope.** *The basement walls, exterior walls, floor, roof and any other building elements that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.*

**Type IC Luminaire**— *Luminaires marked “TYPE IC” may be installed such that insulation and other combustible materials are in contact with, and over the top of, the luminaire. Type IC luminaires are provided with thermal protection to deactivate the lamp should the luminaire be mislamped.*

Section 410.6 of the National Electrical Code (NEC) requires luminaires to be listed. UL Listing covers the evaluation for safety in accordance with ANSI/UL 1598, the Standard for Safety of Luminaires, and other applicable safety standards. To evaluate luminaires for air leakage, UL also offers performance certification to ASTM E283 for compliance with IECC and CEC Title 24 requirements. Products certified by UL and found to comply with **both** safety and performance requirements will bear an enhanced mark as shown:



### Frequently asked questions:

#### Is air leakage certification required?

Yes. Certification is required to demonstrate compliance with the International Energy Conservation Code (IECC) and California Energy Commission (CEC) Title 24, Part 6. Products certified for safety only may be rejected by AHJs.

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*(cover story continued)*

## Promoting Safety in Electric Signs for Over 100 Years

were required to provide corrosion protection and meet minimum thickness requirements. These same principles are essentially applied in the latest edition of UL 48, the 15th edition, although this latest version has far more elaborate tables specifying minimum thicknesses for coated and uncoated metals of different types and dimensions based on their function. The first edition also had a requirement for each sign compartment to be provided with one or more vent holes of not less than 3/4 in diameter in the bottom. Today, this same requirement (with more specificity for hole dimension and shape) is commonly known as the drain opening requirement.

Throughout its 100-year journey, UL 48 has kept-up with advances in technology and manufacturing. Today, the standard addresses requirements for light sources ranging

from neon, fluorescent, HID and LED, and constructions ranging from portable, fixed cabinets, monument and billboard signs. The requirements address signs incorporating changing message digital displays and signs powered by photovoltaic panels. Most importantly, the collaboration between UL and industry has remained unwavering through 14 major revisions driven by contributions primarily from UL staff and participants of Industry Advisory Groups (IAG) and, more recently, the Standard Technical Panel (STP) for UL 48. The collaboration is also well demonstrated through coordinated efforts to promote sign safety by all three major US sign associations, NEC Code Making Panel 18, and the broader regulatory community consisting of inspection officials across the continent. UL is very proud of its role in this history and looks forward to many more years of continued progress.

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## Luminaire Air Leakage: Stopping the Energy Villain

**If a UL Certified luminaire is marked “air tight,” does that signify that UL certified it for compliance with ASTM E283?**

No. The term “air tight” does not appear as part of the UL Certification markings. Look for the UL Certification Mark that specifies both SAFETY and PERFORMANCE as well as the statement “Also Certified to ASTM E283.”

**Does air leakage testing to ASTM E283 have any correlation or similarity to CCEA (City of Chicago Environmental Air) or IP (Ingress Protection) ratings?**

No. These are unrelated to IECC and CEC Title 24 requirements.

**Is air leakage certification at UL limited to LED luminaires?**

No. UL can also certify other products for air leakage including:

- IEVV – Fluorescent Recessed Luminaires
- IEZX – Incandescent Recessed Luminaires
- IFAO – Light-emitting-diode Recessed Luminaires
- IFDR – Low-voltage Lighting Systems, Power Units, Luminaires and Fittings

**Where can I locate the UL Guide Information for these product categories?**

The easiest way is to visit [www.ul.com/productspec](http://www.ul.com/productspec), the next generation of the UL White Book. Product Spec is a powerful, free resource for the electrical professional. From the main page, select “UL Product Category Code,” enter one of the 4-digit alpha codes shown above and hit “search.” Searching by “Product Type” or by “Products, Systems, or Assemblies” are other convenient options.

From there, users can view the UL guide information for the product category (click on “Show additional information” to see the full guide) as well as view the list of all manufacturers with current UL certifications in a category. The scope of the UL Standard is also available for viewing along with technical publications in some product categories.

**For more information on luminaire air leakage testing and other UL services, please visit us at [ul.com/lighting](http://ul.com/lighting), email us at [LightingInfo@ul.com](mailto:LightingInfo@ul.com) or call us at 1-877-ULHELPS.**

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## The Problem With Light Quality

By Joachim Ritter / PLDA Chairman

Everyone talks about it, but nobody really knows what it means.

Quality can be a real challenge. We are all for it, but hardly anyone knows what it means or even what is necessary to ensure it. In our modern society, quality has become a sales argument, which sometimes seems to be shifting the boundaries of this very characteristic. With regard to products, this is all totally understandable, but when it is a question of the quality of light, the discussion tends to get out of control and lacking in substance. Why is that?

Maybe it is due to the fact that there is generally very little understanding of what light is and how it functions. Furthermore, many confuse lighting design with lighting engineering or luminaire design and, as a consequence, light quality with luminaire quality. So let's try to illuminate the facts.

One widely used definition regards quality as the degree of conformity between the requirements or expectations (Target) of a product and its properties (Actual). In the case of something tangible like a product, that is definitely a good basis. Anyone can see what he is holding in his hand, what this product does and how long it works. But in the case of light, we are talking about aspects that we cannot see or feel, even though light facilitates vision. It is all about well-being, health and something that affects us without us even having to think about it. Light has a non-visual effect on human beings. It controls our biorhythm, promotes a feeling of well-being and impacts our health. We are therefore talking about non-visual effects. How can we make this clear to non-experts? It is practically impossible.

In 2001 it was scientifically proven, and has become standard knowledge, that light can have a positive or negative influence on our minds and bodies. In that sense, health is one factor that defines light quality. This is broadly recognized in the lighting industry and is often referred to as Human Centric Lighting. This is extremely interesting, because on the one hand this definition infers that any lighting solution that is not human-oriented does not meet

requirements and expectations — even when the consumer and non-expert is unaware of them — and therefore automatically does not fulfill the definition of quality. On the other hand, the industry is using this quality criterion to try to define the quality of luminaires, which, as mentioned above, is a lot easier to comprehend in the case of visible, tangible products.

A so-called Human Centric Luminaire does not automatically provide human-centric lighting, however. Designers can still create poor lighting schemes using good luminaires. Light quality is something that is aligned to human needs, from both the visual and the non-visual point of view. No way can a luminaire achieve this level of quality without knowing the needs of the person using the light it provides.

Even professionals talk at cross purposes when they discuss light quality. Lighting engineers understand good lighting to stand for high efficiency, that is to say lots of light for little energy. The architect tends to have an eye for the aesthetic qualities — shape, design, materials — of the luminaire. Although you have to admit that this was quite different before the invention of the incandescent lamp, and today there are signs that people are beginning to think differently about the whole topic. The lighting industry interprets good lighting as luminaires that sell well. The client and investor tend to consider lighting good if it is reasonably priced and works. Environmentalists regard as little light as possible — especially after dark — as a good thing. Politicians consider lighting that does not give rise to too many problems as being a good solution. And the user just wants to feel good and have the right light to be able to pursue his/her activities.

The lighting designer is above all obliged to fulfill the needs of the user, and is fully aware of all other aspects when it comes to making compromises to come to the best solution. However, there is no way of guaranteeing sure-fire success, and the lighting designer definitely deserves the right to charge a fee for his commitment towards the user and the client, just as a lawyer or a doctor charges fees for providing expertise and know-how.

## New Performance Testing Solutions

The UL lab in Allentown, PA is proud to announce the expansion of our portfolio of performance testing services for numerous industry segments with the addition of:

- » **INGRESS PROTECTION (IP) & IMPACT PROTECTION**
  - IP testing determines a products resistance to water, dust and foreign objects.
  - IK testing demonstrates the degree of impact protection a product has.
- » **INTERNATIONAL SAFE TRANSIT ASSOCIATION (ISTA)**
  - Packaging testing assesses the security and integrity of goods during transport.
- » **VIBRATION**
  - Vibration testing and mechanical shock help ensure manufacturers that their products or materials are structurally sound and resilient.
- » **RETAIL (PRE- AND POST-PURCHASE)**
  - UL provides customized testing to retailer protocols as well as industry standards.

- » **SALT SPRAY/CYCLIC CORROSION**

- These tests evaluate the effects of corrosive environments on coating and materials.

- » **THERMAL SHOCK**

- Thermal Shock testing helps determine how materials and components will perform while exposed to harsh operating environments or applications.

- » **ULTRA VIOLET (UV)**

- Evaluation of the performance and safety of devices that emit UV light for both the beneficial and harmful effects of UV radiation.

- » **PHOTOBIOLOGICAL**

- The measurement of different levels of optical radiation emitted by lighting devices.

UL's technical experts are committed to providing testing services that meet the high expectations of any industry; from the design phase to testing, certification and even the packaging and shipping of your products, our team is available to help guide you through these extensive services.

For information, call us at (610) 774-1300, or email [PerformanceSolutions@ul.com](mailto:PerformanceSolutions@ul.com)

## India BIS - Compulsory Registration Scheme: Phase 3 Scope Published and Includes LED Products

In follow-up to the article in the last issue regarding India BIS expansion of scope for Phase 3, MEITY (Ministry of Electronics & Information Technology) issued the official order for Introduction of BIS CRS 3rd Phase on 16th August 2017. Thirteen new electronic product categories have been added and include LED products. The following are the LED products that have been added:

**Implementation Dates:** 17th February 2018

### How UL can help

Our laboratories in India are already prepared to start testing for the new standards, and manufacturers can start submitting products for testing. For more information, visit our Global Market Access website or contact our experts at [gma@ul.com](mailto:gma@ul.com).

*These updates are for information purposes only and are not intended to convey legal or other professional advice.*

PRODUCT	INDIAN STANDARD NUMBER
Recessed Luminaries	IS 10322 (Part 5/Sec 2) : 2012
Luminaires for road and street lighting	IS 10322 (Part 5/Sec 3) : 2012
Flood Lights	IS 10322 (Part 5/Sec 5) : 2013
Hand lamps	IS 10322 (Part 5/Sec 6) : 2013
Lighting Chains	IS 10322 (Part 5/Sec 7) : 2013
Luminaires for emergency lighting	IS 10322 (Part 5/Sec 8) : 2013
Luminaires for emergency lighting	IS 1032-5-8

# Standards Corner

Standards information link [HERE](#).

Sign up for “What’s New” at [HERE](#) and select “Join Email List” on the What’s New site to receive email notifications twice a month listing the various UL, UL Environment, and ULC Standards documents published during that timeframe.

## Standards Update

### UL 1786 – Direct Plug-In Nightlights (Bi-National Standard)

- The next revision cycle is starting. UL and CSA both issued Calls for Proposals in May with a due date of June 10, 2017. No new proposals were received by UL or CSA. A new Call for Proposals will be initiated next year.

### UL 1598 – Luminaires (Tri-National Standard)

- The next revision cycle has started, which will be a 2-year cycle. Proposals received by the SDOs were issued for preliminary review on August 28, 2015. Comments are due on October 12, 2015. Link to summary of topics: <http://www.comm-2000.com/ProductDetail.aspx?UniqueKey=30005>. Proposals were issued for ballot on April 28, 2017. Ballots and comments are due on June 12, 2017. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=32711>. Comments received during ballot are now being reviewed by the Technical Harmonization Subcommittee.

### UL 1598C – Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits

- A proposal was issued for ballot on May 26, 2017 with a due date of June 25, 2017. The proposal relates to adding requirements to LED stage and studio luminaire retrofit kits. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=32882>. Consensus was achieved and revisions were published on July 12, 2017. Revisions were published on July 12, 2017.

### UL 2108 – Low Voltage Lighting Systems

- A new proposal was issued for ballot and comment on April 14, 2017 with a due date of May 15, 2017. The proposal relates to: 1) Addressing equipment for use in environmental air spaces; 2) Revising requirements for enclosure openings; and 3) Adding electrical ratings for power units and luminaires. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=32653>. Consensus was achieved and revisions were published on May 30, 2017.

### UL 935-1 – Discharge Lamp Control Devices, Part 1 – General Requirements (Tri-National Standard)

- A proposed first edition of NMX-J-611/1-ANCE / CSA C22.2 No. 74-1 / UL 935-1 was issued for preliminary review on February 10, 2017 with comments due on April 10, 2017. The proposed tri-national new edition is intended to harmonize ballast safety

requirements in the North American region. The proposal is considered Part 1 describing general requirements applicable to all types of ballasts. Part 2’s of this standard will be published at a later date and will include descriptions of test procedures, test modules, and specific requirements. CSA is the Publication Coordinator. Link to summary of topics: <http://www.comm-2000.com/ProductDetail.aspx?UniqueKey=32349>.

### UL 1993 – Self-Ballasted Lamps and Lamp Adapters (Tri-National Standard)

- The next revision cycle has started. A Call for Proposals was sent out on December 2, 2016. UL (Publication Coordinator) has forwarded the proposals to the Technical Harmonization Committee for review. Proposals are currently being reviewed by the Technical Harmonization Committee.

### UL 8750 – Light Emitting Diode (LED) Equipment for Use in Lighting Products

- A new proposal was issued for preliminary review on January 8, 2016 and was subsequently issued for ballot on August 19, 2016. The proposal relates to the addition of a new Supplement SF covering Requirements for LED Drivers with Control Circuits. Link to the summary of topics: <http://www.comm-2000.com/ProductDetail.aspx?UniqueKey=31492>. The proposal was issued for recirculation on December 23, 2016 with ballots due on January 23, 2017. Revisions were published to include Supplement SF on July 27, 2017.
- A new proposal was issued for preliminary review on October 14, 2016. The proposal relates to the expansion of UL 8750 scope to include LED controllers supplied from branch circuit. Link to summary of topics: <http://www.comm-2000.com/ProductDetail.aspx?UniqueKey=31812>. This proposal was issued for ballot on April 7, 2017. Ballots and comments are due on May 23, 2017.
- A new proposal was issued for ballot on March 24, 2017. The proposal covers multiple topics. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=32539>. Revised proposals were issued for recirculation on June 30, 2017 with ballots and comments due on July 31, 2017. Consensus was achieved and revisions were published on August 17, 2017.
- A new proposal was issued for ballot on August 4, 2017. Ballots and comments are due on September 18, 2017. The proposal relates to adding requirements for conduit-connected enclosures. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=33167>.

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### UL 496 – Lampholders (Bi-National Standard)

- A new proposal was issued for ballot on May 23, 2016. The proposal relates to the proposed Fourteenth Edition of the Standard for Lampholders, UL 496, includes the following changes from the previous version: (a) Addition of SA2.4 and SA2.5, to Add Requirements for Lampholder Fittings with Integral USB Connectors, (b) Addition of 4.8.6.6, to Add Requirements for Minimum Lead Wire Gauge Size for GU24 Outlet-Box Lampholders, (c) Addition of 4.9.10, to Clarify the Creepage Distances and Clearances Measurements, (d) Editorial Updates. Link to summary of topics: <http://www.comm-2000.com/ProductDetail.aspx?UniqueKey=31132>. Consensus was achieved but the comment received was addressed by the proposal submitter and sent to the THC to evaluate. A revised proposal was recirculated on June 23, 2017 with ballots and comments due on July 24, 2017. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=32985>. Consensus remained during the recirculation of this ballot and a new edition of the standard will be issued.

### UL 48 – Electric Signs

- A new proposal was issued for preliminary review on May 24, 2016. The proposals relate to: 1) New Requirements for Shipment of Sign Sections; 2) Standard Reference for LED Components and LED Retrofit Kits; and 3) Revision title of Section 4.4.10.2. This proposal was issued for ballot on March 3, 2017 with ballots and comments due April 3, 2017. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=23299>.

### UL 924 – Emergency Lighting and Power Equipment

- A new proposal was issued for ballot on July 14, 2017 with a due date of August 14, 2017. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=33051>.

### UL 379 – Power Units for Fountain, Swimming Pool, and Spa Luminaires

- A proposal to reaffirm the First Edition of the Standard for Power Units for Fountain, Swimming Pool, and Spa Luminaires, UL 379, was issued for ballot on July 21, 2017 with ballots and comments due on September 5, 2017. Link to summary of topics: <http://www.shopulstandards.com/ProductDetail.aspx?UniqueKey=33104>.

# Webinars

## Free Recorded Webinars

### Take Advantage of UL's FREE Industry Recorded Webinars

- [Shining a Light on 2017 Regulatory Updates – A Retail Lighting Overview](#)

*Lighting uses about 10% of the total power generated in the US, making lighting efficiency a focus for regulations and energy efficiency incentive programs. Staying on top of these changes is challenging but necessary for retailers to plan ahead, particularly those with private brands. This 1-hour webinar will highlight recent changes to requirements, effective dates, and anticipated impacts of these changes.*

- [Title 20 and Title 24 Updates – Are Your Lighting Products Ready?](#)

*California regularly updates their Title 20 Appliance standards and Title 24 Building standards, both of which have complex requirements for lighting products. This 1-hour webinar will provide an overview of lighting requirements and highlight the recent changes that manufacturers and retailers need to know.*

- [Growing the Understanding on Safety & Performance in Horticultural Lighting](#)

*This 1-hour event will cover the fundamental differences between horticultural lighting equipment and lighting equipment intended for general lighting application. UL's new safety requirements for horticultural lighting equipment and the broad range of safety and performance evaluation offerings for this specialized lighting equipment will also be covered.*

## Safer Swimming Through Low-Voltage and Isolation

By Michael Shulman / UL Principal Engineer

When electric lighting was first introduced in swimming pools, many people learned firsthand what was meant by the phrase “water and electricity don’t mix.” Fortunately, research performed by UL engineers and the subsequent publication of UL 676, Standard for Underwater Luminaires and Junction Boxes, made significant contributions towards reducing these very serious and often fatal electric shock events. But this approach had some vulnerabilities as it relied on a multitude of safeguards, including proper luminaire design, code-compliant installation (which itself involves multiple steps and pieces of equipment) and ongoing equipment maintenance. Swimming in the presence of electricity can be made safe, but it takes a lot of effort and attention to detail.

Mostly unheralded and overshadowed by the vast improvements it has brought to general lighting applications through improved efficiency, longevity, and light quality, LED technology has also greatly improved the safety and reliability of swimming pool luminaires. A key factor in the safe use of legacy line voltage and mostly incandescent swimming pool luminaires is to capture and route any ‘leakage current’ — electrical current that escapes from the luminaire into the environment — into the equipotential grounding plane that Article 680 of the National Electrical Code (NEC) requires throughout the swimming pool environment (including the water!). The concept is to provide a better (lower resistance) path for these stray currents so they do not pass through the bodies of any swimmers. It is a perfectly valid concept, anchored in physics and physiology, and compliant products in Code-compliant installations have had a very good track record; however, this approach does require many pieces to fit properly together to achieve its full safeguarding capability.

Because LED luminaires can generate sufficient light output when supplied by a low voltage source that is isolated from the ground plane, their safeguards against electric shock are much simpler and, as a result, more reliable. At these much lower voltages (the wet location limit is 30 Vdc or 15 Vac), human skin and internal body impedances are higher and can more effectively attenuate the flow of current through the body. More importantly, the voltage potential that moves electrical current from one location to another exists only within the luminaire. There is no reference to the

ground plane so the electrical current has no interest (and no ability) to flow through the water. This greatly reduces the severity of an electric shock incident (by current attenuation) and, though not impossible, the probability of an incident occurring drops to insignificant levels.

In 2011, UL successfully proposed NEC revisions to exempt luminaires operating below the “low voltage contact limit” from certain requirements (grounding, GFCI protection, and some location constraints). This action paved the way for UL 676, in 2013, to introduce requirements for isolated low voltage luminaires that allow a more streamlined evaluation process while still enhancing overall safety relative to earlier generations of luminaires. The majority of swimming pool luminaires being evaluated today are of the isolated, low voltage variety.

In December 2015, CSA released a new (3rd) edition of its standard for swimming pool luminaires. The previous edition was published 40 years earlier and, while re-affirmed in 2013, it had actually never been revised since its original May 1976 publication. The new edition incorporates some requirements from CSA’s Technical Information Letter (TIL) B-44, which was released in 1999 to address requirements suitable for certain extra-low voltage incandescent luminaires. A set of errata revisions were published in December 2016, and additional technical revisions followed in June 2017. CSA has set an effective date of July 1, 2018 for its certification customers to establish conformance with the new requirements.

The good news for UL customers is that the ‘new’ requirements for Canada are already addressed by UL 676, meaning products that currently have UL & C-UL certification status need not be re-evaluated. By performing a clause-by-clause review of the CSA 89 3rd edition in comparison to the requirements of UL 676 (9th edition, published August 2015), UL created a set of guidance documents to facilitate bi-national certification of luminaires, eliminating redundant steps and recognizing where Canadian compliance is already established through a UL 676 investigation. While the standards are by no means fully harmonized, the time and cost savings can be substantial.

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## Mexico: New Standards for Lighting Products

By Aurora Paguia / LATAM Regulatory Program Expert

DGN (Dirección General de Normalización - General Direction of Standardization) in conjunction with ANCE (Asociación de Normalización y Certificación – Certification and Standardization Organization Association) and NYCE (Normalización y Certificación - Certification and Standardization Association), worked continuously on the revision of the different standards to strengthen economic competition and align the safety requirements of electric products to international standards.

The following standards were published on the DOF (Federal Official Diary) and will replace current versions of the standard. The effective dates are noted below:

- » **NMX-J-307-ANCE-2017 “GENERAL USE INDOOR AND OUTDOOR USE LUMINAIRES” - EFFECTIVE ON OCTOBER 04, 2017**
- » **NMX-J-588-ANCE-2017\* “SEASONAL AND HOLIDAY DECORATIVE PRODUCTS” - EFFECTIVE ON NOVEMBER 07, 2017**
- » **NOM-058-SCFI-2017\* “CONTROLLERS FOR ARTIFICIAL LIGHT SOURCES, FOR LIGHTING PURPOSES IN GENERAL” - EFFECTIVE ON FEBRUARY 11, 2018**

*\*Note- Seasonal and Holiday Decorative Products were previously evaluated to NMX-J-521-ANCE-2012. The scope of NOM-058-SCFI-2017 now includes LED controllers.*

Products submitted for certification prior to the effective date can be evaluated to the old standard. Products submitted for certification on or after the specified effective date must be evaluated to the new standard.

### How UL can help

Our Global Market Access team is prepared and can help you achieve compliance to these new requirements. For more information, visit our Global Market Access website Global Market Access [www.ul.com/gma](http://www.ul.com/gma) or contact our experts at [gma@ul.com](mailto:gma@ul.com).

*These updates are for information purposes only and are not intended to convey legal or other professional advice.*

*(continued from page 10)*

## Safer Swimming Through Low-Voltage and Isolation

The scope of CSA 89 extends beyond that of UL 676, incorporating requirements for swimming pool luminaire power supplies and deck-mounted junction boxes; for the U.S., those requirements are covered by UL 379 and UL 1241, respectively. There is also some uncertainty at this time as to whether proposals to adjust the installation requirements of Section 68 in the Canadian Electrical Code (CSA C22.1) have been submitted, parallel to those of the NEC, to exempt the isolated extra low voltage luminaires now within the scope of CSA C22.2 No. 89 from the GFCI requirement applicable to branch-circuit connected, line voltage luminaires. In the U.S., UL waited until after the NEC update occurred; CSA has apparently chosen a different sequence in Canada. UL will monitor this situation in the hopes of avoiding conflicts between inspection official expectations and the installation instructions of certified luminaires.

With both improved luminaire safety and improved swimming pool luminaire safety regulation alignment across North America, these are good times for swimmers. Enjoy the water, and the weather, while it lasts!

# Tradeshows & Events

## American Lighting Association Annual Conference 2017

September 10-12, 2017  
Vancouver, BC

## Shanghai International Lighting Fair

September 5-7, 2017 – Shanghai, CN

## BIEL Lighting Argentina – LATM

September 12-16, 2017  
Buenos Aires, AR

## LpS – Austria

September 26-28, 2017–Bregenz, AT

## Sign Expo Canada

October 27-28, 2017 – Mississauga, ON

## LightShow West

October 11-12 – Los Angeles Convention Center,  
Los Angeles, CA

Join UL's Lighting Performance Technical Advisor, Austin Gelder, for Roundtable 13 – Horticultural Lighting 101: How to Evaluate this Growing Category.

- Thursday, October 12
- \$25 per seat
- 3:00 – 4:00 pm
- Register [HERE](#)

*\*Qualifies for 1.0 AIA LU | HSW; 1 BOMI CPD; 1 IDCEC | HSW; 1 NCQPL LEU*

To set up a meeting with a UL representative at LightShow West please contact [LightingInfo@ul.com](mailto:LightingInfo@ul.com)

## Enlighten Americas

October 12 – 14 | Grand Hyatt Denver, Denver, Colorado

UL is proud to be a Gold Sponsor of the 17th annual IALD Enlighten Americas conference. Get in the action! Stop by UL's "Cross-Talk" table.

Learn more and register [HERE](#).

To set up a meeting with a UL representative at Enlighten Americas please contact [LightingInfo@ul.com](mailto:LightingInfo@ul.com).

## Horticultural Lighting Conference USA

October 17 – Denver Marriott City Center, Denver, Colorado

\*UL is a Presenting Sponsor

Join UL's Lighting Performance Technical Advisor, Austin Gelder, for Session 1 of the conference: Science, Standards, and Market Transformation.

- 10:30 – 11:00 am
- Topic - Speaking Plant: Language of Horticultural Metrics, Test Methods, and Standards
- ABOUT this presentation - Photometric terms like Lumens, CRI and CCT have no place in plant growth lighting because plants don't have eyes. To adequately describe the lighting needs of plants and objectively compare performance of horticultural lighting products, a whole new vocabulary is needed. This session will cover applicable metrics (such as PAR, UV, IR,  $\mu\text{mol/J}$ , and DLI), standards, and test methods for horticultural lighting, considerations for testing, and what is upcoming and in development for horticultural lighting.

Learn more and register [HERE](#)

To set up a meeting with a UL representative at the Horticultural Lighting Conference, please contact [LightingInfo@ul.com](mailto:LightingInfo@ul.com)

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