



LUMEN | INSIGHTS®

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ENERGY STAR® UPDATES

ENERGY STAR® V2.0: Leveraging the “Bulb in a Box” Certification Pathway

By Austin Gelder / Lighting Performance Technical Advisor

On May 29, 2015 the US EPA's ENERGY STAR® program published the final Luminaires V2.0 Specification. This specification update tightened many performance requirements, requires all luminaires to ship with a light source, and requires recertification of existing products. The specification also introduces a streamlined pathway to certification for non-directional luminaires that ship with ENERGY STAR® certified lamps.



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Luminaires V2.0 Update

By Austin Gelder / Lighting Performance Technical Advisor

DEVELOPMENT

The ENERGY STAR® Luminaires V2.0 specification was released May 29, 2015 by the U.S. Environmental Protection Agency, which wraps up a specification development process which had proceeded at a very rapid pace. From the first release of the discussion document was October 2014 to the final specification in May 2015 (with 2 drafts in between in December 2014 and March 2015), the specification took only 7 months to complete. The Luminaires V2.0 Specification development process proceeded very quickly, and has left many manufacturers with questions such as:

- When does this impact my products?
- How does this impact my products?
- How do I manage these changes and take advantage of opportunities?

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A Letter from Todd



Greetings,

As LED Lighting continues to expand its footprint in Commercial and Residential applications and the Performance and Quality characteristics of this technology continue to advance, the industry is keeping a watchful eye on the activities and progress in several areas, such as Lifetime, Reliability, Color Quality, Color Stability, Flicker, and Dimming. UL is also very interested in these topics, and we are working to engage industry at various levels to provide support and assistance wherever we can. Our commitment to advancing the Performance of LED Lighting is evident in our announcement of our brand new Lighting Performance Testing laboratory, which will be located in Brea, CA and is slated to open in August 2015. Look for an announcement regarding our grand opening soon! There are many other initiatives in the works as well, as we look forward to assisting our clients and the industry with elevating the overall Performance and Quality of LED Lighting.

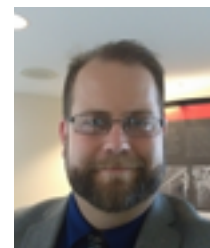
Best Wishes for a Safe Summer Season!



Business Development Director,
Global Lighting

Welcome to UL!

Austin Gelder has joined the UL team in the newly created role of Lighting Performance Technical Advisor. Prior to joining UL, Austin spent several years in the lighting industry in the areas of LED Product Development, Technical Consulting, and Lighting Testing and Measurement. Austin most recently worked for ICF International, serving as a Sr. Associate and Technical Consultant for the ENERGY STAR Program where he led the development of the ENERGY STAR Luminaires and Lamps specifications. In his role, he regularly communicated with manufacturers, laboratories, certification bodies, and government agencies to assist with their understanding of the programs; helped to resolve conflicts; and improved the next versions of the specifications.



Prior to his work with ICF and EPA, Austin worked as a Product Manager LED Lamps for Halco Lighting Technologies located in Norcross, GA where he was responsible for Product Development, Supplier Selection, and Product Launch. Additionally, he was responsible for overseeing the Photometric Testing laboratory and the associated accreditations and required approvals for the laboratory. Austin became Lighting Certified through the National Council on Qualifications for the Lighting Professions in 2013. UL is pleased to welcome Austin to the team, and we look forward to his technical leadership as we further expand our Performance Testing resources and capabilities.

Speed of Light – Get your Lighting Products to Market in Four Weeks or Less Guaranteed*

UL understands the importance of your time-to-market needs and is here to help you get your LED lighting products to market as fast as possible. Using UL's rock solid technical expertise, our solution-oriented approach, and our razor sharp focus on customer service, we are able to offer turn-around in four weeks or less for North American certification.

**Get your submittal started today.
Please contact:**

Syed Hamdani, Syed.H.Hamdani@ul.com
714.223.3686

Tom Sciotto, Thomas.Sciotto@ul.com
631.546.2766

In addition to the turn-around time noted, we also offer other services at even faster speeds:

- Two days for General Coverage Luminaires and Signs
- Two weeks for projects using our Client Test Data Program
- Two weeks for Driver Upgrade with TL Ratings
- Three weeks for LED Arrays, Modules and Packages

**Certain terms and conditions apply.*

(continued from page 1)

ENERGY STAR® V2.0: Leveraging the “Bulb in a Box” Certification Pathway

WHAT DOES THIS MEAN FOR MANUFACTURERS?

LUMINAIRE MANUFACTURERS

Screw based luminaires can now obtain ENERGY STAR® Certification! Luminaire manufacturers have a wider selection of light sources to select the appropriate shape, size, and color temperature for the luminaires. This opens a huge portion of a manufacturer’s residential portfolio to certification, with no modifications to the fixture construction. The requirements are also significantly streamlined, allowing an easier, faster certification.

Requirements for the Lamps used:

- All self-ballasted (CFL) or integrated LED lamps must be ENERGY STAR® Certified
 - Screw bases are now ALLOWED
 - GU24 are also allowed
- Efficacy of ≥ 65 lumens per watt per lamp
- Minimum light output of 250 (25W equivalent) to 800 lumens (60W equivalent) depending on the luminaire type
- Appropriately safety rated for the fixture type (e.g. an enclosed luminaire needs lamps that are acceptable for use in enclosed fixtures)

Luminaire specific requirements:

- Non-directional type luminaire.
- Enclosed fixtures must have a thermal test with the lamp installed
- Packaging, Labeling, Safety Rating and Warranty are reviewed
- Have lighting toxics documentation

It is important to note that this certification pathway is new and additional; it does not replace other light source options such as pin based lamps or LED light engines.

LAMP MANUFACTURERS

For lamp manufacturers, it is another channel to sell products and another way to leverage ENERGY STAR® certification. Some considerations to maximize the ability of a lamp to be used in fixtures are:

- Ensuring that the lamp meets the 65 lumens per watt in all CCTs and CRIs
- Design the lamp for enclosed fixtures and life test the lamp in the elevated temperature
- Have lamp options that meet the light output requirements for the different types
- Utilize UL to assist in determining how product family variations can be used to minimize testing

WHEN CAN A MANUFACTURER START CERTIFYING?

The manufacturer can begin certifying immediately, and the products can be displayed once EPA updates their Product Finder to include Luminaires V2.0.

To learn more about how UL can help take advantage of this exciting new certification pathway, please contact UL’s technical experts via email at performancelighting@ul.com or call us at 610-774-1300.

UL Services for U.S. DoE Mandatory Energy Conservation Program for External Power Supplies

By Michael Ritto / P.E. Business Development Manager for Lighting Components

External power supplies sold in the US must meet updated and expanded DoE Energy Efficiency requirements by February 2016. UL can help ensure you are on schedule and in compliance!

In February, 2014, the U.S. DoE issued a new standard for energy efficiency for external power supplies. This standard mandates more stringent energy efficiency levels for a great spectrum of external power supply types, many of which were not previously subject to DoE energy conservation standards.

The DoE estimates that these requirements will save consumers up to \$3.8 billion and cut emissions by nearly 47 million metric tons of carbon dioxide over 30 years, equivalent to the annual electricity use of 6.5 million homes. [1]

For more information about UL services to meet these upcoming DoE requirements, contact us at 1.877.UL.HELPS (1.877.854.3577) or email us at cec.us@us.ul.com.

LED Drivers – Your Key to the Global Market

By Michael Ritto / P.E. Business Development Manager for Lighting Components

It seems that the world is becoming smaller every day. Whether it's through the internet, social media, or a quick flight to a foreign destination, the world has become more accessible. The same can be said for the lighting industry. More and more, we are seeing lighting products that are designed for use not only in the North American market, but also in the global market. LED technologies, specifically LED Drivers, are the components that are enabling easier connection to the global grid. Many LED Drivers have universal input ranges (i.e. 120 – 277 Vac and 50 – 60 hz), which allows for one set of components that can connect to any global utility infrastructure.

As the world becomes smaller, the number of things you must consider before sending your products into the global market continues to increase. Traditionally, simply having a UL Certification Mark was enough. Whether you had a UL Recognition or Listing, your LED Driver products were allowed to be used in or with any Luminaire entering the North American market. That's no longer the case. But, did you know that UL, the leader in global market certifications, is able to help provide you with the guidance you need to bring your products to the global market?

With our Global Market Access (GMA) services, UL is the #1 National Certification Body for the International Electrotechnical Commission (IEC) CB Scheme two years running. Evaluating your products to the IEC Standards and obtaining a CB Certificate gives your LED Drivers access to the markets of the 45 countries affiliated with the IECEE. Additionally, UL has offices strategically positioned around the world to help facilitate the issuance of Marks for Europe, Asia/Pacific, and South America. Specific marks include the CE Mark, D Mark, ENEC Mark, RCM Mark (Australia/New Zealand), CCC Mark (China), BIS Registry (India), PSE Mark (Japan), EAC Mark (Russia, Belarus & Kazakhstan Customs Union), and S-Mark (Argentina).

Safety is just one piece of the puzzle, though. Along with safety, manufacturers must also consider energy efficiency, environmental ratings, emissions and immunity, green ratings, interoperability, and performance. Through our close connections with government agencies, industry groups, and consortiums and standard development organizations, UL is well versed and often involved in the creation of many of these requirements. Our team of experts can help provide you with the guidance you need to maximize your product's potential. UL is fully equipped to handle all of your performance testing needs. Our capabilities allow us to offer the full scope of testing across the entire Ingress Protection (IP) rating spectrum, as well as performance benchmarking and reliability testing, including NEMA SSL-7A, NEMA 410, and IEC 62384.

All of these requirements can be overwhelming. Save yourself the trouble by leveraging our expertise! Contact us at 1.877.UL.HELPS (1.877.854.3577) or email us at cec.us@us.ul.com.

Luminaires V2.0 Update *(continued from page 1)*

IMPLEMENTATION: WHEN DOES THIS IMPACT MY PRODUCTS?

The bad news: All products have to be re-certified and there is additional testing, there is no “grandfathering” of existing products.

The good news: Manufacturers can start certifying to Luminaires V2.0 immediately, much of the existing test data can be reused, and the additional testing can start as soon as EPA sets requirements for laboratories to be recognized.

Key dates manufacturers need to know:

- **December 1, 2015**

Nothing new can be certified to Luminaires V1.2

- **June 1, 2016**

Everything not certified to Luminaires V2.0 is removed

CHANGES TO THE SPECIFICATION: HOW DOES THIS IMPACT MY PRODUCTS?

With the major specification revision, there have been some additions to the specification which offer new opportunities for ENERGY STAR® certification. Some manufacturers may find challenges with features removed from the specification and more stringent performance requirements, which will impact the ability of some products to recertify,

ADDITIONS:

New and expanded product categories open additional products to certification, and EPA has introduced an additional streamlined path to certification.

- SSL Surface Mount Retrofits for Ceiling Mount and Wall Sconce
- Color Tunable Luminaires
- Expanded Non-Directional Outdoor Luminaires
- ENERGY STAR® “Lamp in the Box” Path to Certification with limited testing

REMOVALS:

Several product types have been removed from eligibility, which will impact the ability for some products to be recertified to the new specification.

- Luminaires Shipping Without a Source
- Linear Fluorescent
- Halogen
- HID
- Commercial / Residential Distinction

PERFORMANCE REQUIREMENTS CHANGES:

As anticipated, there are a number of more stringent requirements and some additional testing. While many requirements are tighter, ENERGY STAR® has included additional flexibility in some requirements, creating opportunity for a wider range of products to earn the ENERGY STAR® mark.

- Increased efficacy
- Minimum Light Output changes
- Color Angular Uniformity
- Changes to Lifetime, Lumen and Color Maintenance
- Required testing for Start Time and Run-Up Time
- Standby Power Reduction
- Thermal Performance for Retrofits
- Dimming Testing Changes
- Connected (Smart) lighting
- Packaging and Labeling Changes

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Safety, Quality, Environment, and Human Impacts

By Roberto Inclinati / Business Development Manager

These were the main themes of the April 15 event organized by UL, which gathered key professionals of the world of Lighting during “Il Salone del Mobile” and “Euroluce.”

UL’s “Full of Light Experience” event had enthusiastic participation and great results. On Wednesday April 15, the event, which was organized by UL, was held at 10 Watt in Milan – an impressive location. The event brought together designers, architects, buyers, manufacturers, and others interested in lighting and green furniture technology and design.

The event was an occasion to celebrate the International Year of Light (IYL) proclaimed by United Nations (UL is a patron sponsor of IYL) and to reflect on new technologies of the lighting business. It also examined the positive effects of Light on life through Human Centric Lighting, a new approach that incorporates how light affects people’s mood, rhythms, visual acuity, and performance together with the vital role that optical fibers, lasers, LEDs, microprocessors, and other applications of photonic technology play in home and workplace environments.

And since light and human care are also affected by sustainability, the event was an occasion for members of the furniture business to meet and discuss themes, such as the design of low-emitting furniture and how it benefits interior environments and the people who live and work in them.

The event also exhibited a photo gallery of projects that featured products tested or verified by UL. Spectacular images highlighted lighting projects of international relevance and those recognized by Italian and international companies with UL’s support of their safety and performance.

The event, organized in Milan, the capital city of Design during the International Salone del Mobile and Euroluce tradeshow, was an important occasion of dialogue, exchange of knowledge, and sharing. UL, as a science company globally committed to safety and sustainability, wanted to highlight the importance of the dialogue of science and creativity within the industry so that it can lead to concrete, positive consequences for people’s health and wellbeing.

In addition to the support of IYL 2015, UL had the support of several associations in the lighting and furniture businesses, including AIDI (Italian Association of Lighting), Apil, Assil, Assodel, Lighting Europe, PLDC (Professional Lighting Designers Convention), and many others.

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Human Centric Lighting

By Roberto Inclinati / Business Development Manager

Human Centric Lighting – you’ve most likely heard these words. But what does Human Centric Lighting mean?

The transition over the past two decades from conventional incandescent and fluorescent lighting to LED lighting has been dramatic. While durability and energy efficiency drove the adoption of LED technology, the next generation of LED lighting will bring a more human touch.

Until the last two centuries, 90 percent of humans’ waking time was spent outside. Now only about 10 percent is spent outdoors. The time spent indoors is usually with the lighting set at one level, which is not consistent with human circadian rhythms – the physical, mental, and behavioral changes that occur over the course of a 24-hour cycle.

Human Centric Lighting can often improve people’s rhythms, short- and long-term alertness, sleep, mood, visual acuity, perception, performance, productivity, and general wellbeing if they are not already optimal. Since most electric light is LED, this lighting is usually efficient and sustainable. It includes

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Standards Corner

[Click here](#) for Standards information.

[Register](#) for "What's New" to receive e-mails twice a month that indicate the new published UL Standards, Outlines, and Proposals.

Did you know that reviewing and commenting on proposed changes to UL Standards is free? Visit the Proposals Available section on UL's online Collaborative Standards Development System (CSDS) and search for a UL standard, or scan the list of currently available proposals. [Click here >](#)

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 sent to CSA (Publication Coordinator). CSA sent proposals to the THC (Technical Harmonization Committee) Chair, and the proposals were reviewed and discussed during February 2014 CANENA meeting. The Publication Coordinator is preparing the document, which will be sent out for preliminary review in the future.

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

- The proposal went out for preliminary review on February 6, 2015 with a due date of March 9, 2015. The proposal relates to fuse requirements for tubular fluorescent to LED conversion retrofit kits.

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

- The next revision cycle has started. UL is the Publication Coordinator. Multiple proposals went out for preliminary review on May 2, 2014. [Link to summary of topics.](#) The comments have been sent to the Technical Harmonization Committee (THC) for review and input. The Publication Coordinator is preparing the document, which will be sent out for ballot in the future.

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

- Multiple proposals went out for preliminary review on October 14, 2013. These proposals were discussed at the November 2013 STP meeting. Some of these proposals went out for ballot on December 5, 2014 with a due date of January 26, 2015. [Link to the summary of topics.](#) A recirculation proposal will be prepared for publication in the future.
- A proposal went out for preliminary review on July 3, 2014. The proposal related to correlating bridging capacitor use in paragraph 7.9.2 with UL 60950-1 requirements. This proposal went out for ballot on September 5, 2014. The proposal then went out for recirculation on December 19, 2014. The revisions were published on April 1, 2015.

continued on next page

UL Offers RedLine Standards

UL recently announced that all registered users of the Standards Certification Customer Library (SCCL) will be offered access to RedLine Standards. The service called RedLine Standards is available via purchase to all registered SCCL users who currently have access to the certification customers' standards library and to others on a subscription basis.

- A UL Standard in RedLine format is a quick and easy way to compare all of the changes between the current, active standard and the previous version of the same edition.
- With a RedLine, the user will immediately see:
 - additions,
 - deletions,
 - and other changes between two versions of the same edition of the standard.
- With a RedLine document, the user no longer has to spend time trying to determine what has changed in the new revision.
- A RedLine-formatted document ensures the user sees the changes to the standard.
- Since RedLine Standards are a "premium" product that would represent an additional cost to UL, all interested parties would pay a nominal fee for this "premium" service. UL Certification Customers will continue to receive the complimentary versions of UL Standards as noted above.

[Click here](#) for an engaging demonstration of RedLine Standards

As a world leader in developing safety standards, UL is offering this state-of-the-art, user-friendly service to all registered users of the Standards Certification Customer Library.

For more information, contact Richard Olesen, UL Standards, UL Silicon Valley Office at +1 408-754-6650 or Richard.A.Olesen@ul.com.

Standards Corner

UL 2577 / ULC-S2577 – Suspended Ceiling Grid Low Voltage Systems and Equipment

- A proposal went out for preliminary review on January 20, 2015 with a due date of February 3, 2015. The proposal is related to: (1) Correct references to Canadian Electrical Code, Part I, (2) Revise voltage references to correlate with Canadian Electrical Code, Part I, and (3) Correct inconsistency in reference to Canadian Electrical Code, Part I, in paragraph 37.3.1. These proposals went out for ballot on March 27, 2015 with a due date of May 11, 2015, which was extended to May 18, 2015. [Link to summary of topics](#). A recirculation proposal will be prepared for publication in the future.

UL 935, UL 1029, UL 542 – Ballasts (Tri-National Standard)

- The draft of Part 1 of the proposed Standard, covering general construction and test requirements, is being reviewed by the CANENA Harmonization Committee (THC34/SC34C) and being prepared for preliminary review.
- The Part 2 documents, which will include specific requirements for the various product types, still need to be developed.

UL 496 – Lampholders (Bi-National Standard)

- The next revision cycle has started. A Call for Proposals was sent out on May 9, 2014, with new proposals due on June 9, 2014. UL (the Publication Coordinator) sent the proposals received to the Technical Harmonization Committee for review. Multiple proposals went out for preliminary review on October 3, 2014. The proposals related to: (1) Proposed Addition of Requirements for Lampholder Fittings with Integral USB Connectors, (2) Proposed Addition of Requirements for Minimum Lead Wire Gauge Size for GU24 Outlet-Box Lampholders, and (3) Proposed Addition of Requirements to Clarify the Creepage Distances and Clearances Measurements. The comments received in response to the preliminary review were sent to the Technical Harmonization Committee (THC) for review and input. A proposed new edition, which incorporates the proposals that were sent out for preliminary review, is being finalized for ballot.

UL 1088 / ULC-S1088 – Temporary Lighting Strings (Joint UL/ULC Bi-National Standard)

- A proposed new edition of the Joint UL/ULC Standard for Temporary Lighting Strings, UL 1088/ULC-S1088, went out for preliminary review on November 13, 2014. This proposed standard specifies the requirements applicable to temporary

lighting strings intended for indoor and outdoor use to provide illumination during construction, repair, or demolition of buildings or structures, or similar activities. This standard covers traditional constructions employing Edison screw base lampholders and also accommodates new constructions incorporating energy efficient LED light sources. The proposed new edition went out for ballot on February 13, 2015. [Link to summary of topics](#). A recirculation of the proposed new edition went out for ballot on April 27, 2015. The new Joint UL/ULC Standards for Temporary Lighting Strings, UL 1088 / ULC-S1088 was published on July 10, 2015.

UL 2108 – Low Voltage Lighting Systems

- Multiple proposals went out for preliminary review on October 24, 2014. The proposals were related to: (1) Power Over Ethernet (POE) Lighting Systems, (2) Revision to Ambient Temperature Measurement Method, (3) Clarification of Cord Connection Option for Class 2 Luminaires, (4) Temperature Test for Clothes-Closet Luminaires, (5) Class 2 Luminaire Marking for Power Unit Compatibility, (6) Clarification of Luminaire Ratings within Part IV, and (7) Clarification of Wet Location Marking for Non-Class 2 Luminaires. The proposals went out for ballot on February 20, 2015 with a due date of April 6, 2015. [Link to summary of topics](#).

UL 676 – Underwater Luminaires and Submersible Junction Boxes

- Proposals went out for preliminary review on February 26, 2015. The proposals were related to: (1) Flexible cord and connectors, (2) Permitted cord size for low voltage luminaires, (3) Drainage and water entry openings, (4) Decelerating unit construction, (5) Marking of isolated low voltage luminaires, and (6) Submersible luminaires. [Link to summary of topics](#). The proposals went out for ballot on April 3, 2015 and then recirculation on April 29, 2015.

UL 1994 – Luminous Egress Path Marking Systems

- Call for Proposals went out on December 2, 2014 with new proposals due December 31, 2014. No proposals were received. UL is proceeding with the reaffirmation of the standard to maintain ANSI approval. The reaffirmation proposal went out for ballot on February 6, 2015. The 4th edition of UL 1994 was published on May 29, 2015.

UL 48B – Changing Message Signs and Displays

- UL is currently developing the proposed 1st edition for UL48B.

Luminaires V2.0 Update *(continued from page 5)*

NEXT STEPS: HOW DO I MANAGE THESE CHANGES AND TAKE ADVANTAGE OF OPPORTUNITIES?

Step 1: Do not procrastinate. Historically there has been a very high demand for laboratory services immediately prior to when old products are removed from the list, act early and eliminate concerns over products being delisted.

Step 2: Choose your testing and certification partner carefully. UL has been testing products for the ENERGY STAR® lighting programs since the program's inception and is an EPA-recognized certification body, making certification quick and easy. There are numerous technical experts on staff to ensure your certifications are done right the first time and to help make the most of your testing.

WHEN CAN A MANUFACTURER START CERTIFYING?

The manufacturer can begin certifying immediately, and the products can be displayed once EPA updates their Product Finder to include Luminaires V2.0.

To learn more about how UL can help take advantage of this exciting new certification pathway, please contact UL's technical experts via email at performancelighting@ul.com or call us at 610-774-1300.

Safety, Quality, Environment, and Human Impacts *(continued from page 6)*

The importance of light and of the connected technologies facing the big challenges of global development was highlighted during the distinguished speeches of Joseph Niemela (Senior Research Scientist by the Abdus Salam International Centre for Theoretical Physics and Coordinator of the Global Secretariat of IYL 2015), Jeff Smidt (Vice President and General Manager of the Global Appliances HVAC and Lighting division in UL), and others throughout the evening, presented by Joachim Ritter (Steering Committee Chair PLDC).

"The International Year of Light," declared Joseph Niemela, "was developed by UNESCO to bring attention to how lighting solutions can improve the wellbeing of everybody. The human centric lighting approach and lighting

planning in general can improve the quality of the environments where we live. Light can be an important contribution to help make our cities more livable and improve quality of life. The science is not enough to face the global challenges of this era; what we need is the involvement and cooperation of researchers, designers, and industry to find proper solutions. We need to work in this direction, extend the research, and create a cooperative system among the leaders of this sector. Innovation is the ability to create a dialogue between technology and creativity."

"Today in the lighting area," said Jeff Smidt, "we find more and more awareness and knowledge. Not only are designers, architects, and manufacturers very carefully regarding innovation and

technology, but consumers are also looking for more sustainable and safe solutions. Technological efficiency and energetic quality are very important. For this reason we need to work to create common standards, to which both designers and manufacturers can refer."

UL supports the global lighting industry with testing and certification services in more than 50 countries. Its safety science expertise, worldwide reach, and active involvement in the lighting industry help those in the lighting supply chain make informed decisions, gain access to new markets, and meet regulatory requirements.

Human Centric Lighting *(continued from page 6)*

daylight, specialized fixed CCT electric light, and tunable light, which includes dimming and CCT (otherwise known as color changing electric light). Candle and other firelight may also be good before going to bed.

Human Centric Lighting is based on human evolution regarding daylight and night, practical case studies, and substantial neuroscience research, especially since about 2000 when intrinsically photosensitive retinal ganglion cells were discovered.

Knowing the following information about a person is not necessary, but can be helpful:

- Age
- Gender
- Morning lark or night owl
- Work or activity schedule
- Times and quantity of
- drinking caffeine and similar stimulants
- Eating patterns
- Mental and/or physical health
- Medications

Proper dosing of light for various tasks is usually very important. This includes:

- Intensity
- Spectrum
- Duration
- Time(s) of day

Some people think that interior electric light should mimic daylight throughout the day for those that get up and go to bed in a good relationship to sunrise and sunset. But the rest of us who go to bed late and/or get up late or work second or graveyard shift can benefit from the use of interior electric light to help us keep our circadian rhythms on the right track. And using light as a way to help us with healthy sleep patterns is likely healthier than relying on caffeine or other stimulants or sleep aids.

Using this approach, lighting engineers take into account how tunability (i.e., dimming and color changing), specialized fixed spectral content, candlelight, and firelight affect the human condition. Engineered with a human-centric approach, the latest lighting technologies “mimic” natural light to create ideal indoor conditions by factoring in light intensity, spectrum, duration, and time of day.

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Global Compliance Offerings in Lighting Categories

Whether you’re interested in one country or multiple markets across the world, UL takes an integrated and customized service approach, offering expert advice with quick solutions for your Global Certification needs.

UL’s global service package provides the complete compliance solution, spanning the entire process and across multiple regulations, such as those for electromagnetic compatibility (EMC/EMF), energy efficiency, photobiological, radio/wireless, and safety.

UL can help in many ways, including:

- Help demystify International certification process for you (the options, requirements, timeline, etc.)
- Conduct gap analysis on your North American certified products intended for a global market
- Review your product for compliance to global lighting standards and provide guidance
- Schedule a formal preliminary design review with you at your convenience
- Conduct a complimentary preliminary informal consultation (1-2 hours) on Global Market Access

The CB Scheme benefits product manufacturers and distributors engaged in international trade by providing:

- A single point of product testing for efficient global market access
- Global acceptance of test reports leading to national certification in CB Scheme member countries
- Unilateral acceptance of test reports in many developing countries that are not yet participating in the CB Scheme

For more information, please contact lightinginfo@ul.com.

Tradeshows

DLC Annual Stakeholder's Conference

August 4-5, 2015 - Washington, DC

[Learn more >](#)

LED Professional Symposium + Expo

September 22-24, 2015 - Bregenz, Austria

[Learn more >](#)

American Lighting Association Annual Conference

October 1, 2015 - Huntington Beach, CA

[Learn more >](#)

PLDC – Professional Lighting Design Convention

October 28-31, 2015 – Rome, Italy

[Learn more >](#)

Lux Live

November 18-19, 2015 - London, England

[Learn more >](#)



Successfully launching products to new markets requires speed and efficiency. It also brings the challenge of meeting a complex web of testing, certification and regulatory requirements. With UL's new interactive world map, information to begin exploring your specific needs is right at your fingertips. Find out how our bundled offerings can help untangle the compliance process and fast track your access to several markets at once.

Find out how UL can help you bring your product to market.

Watch the video now >



Ready to launch? Get started today.

Our UL engineers are happy to talk with you about how Global Market Access can work best for you. [Get started today >](#)

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2. Choose your product category and target region.
3. Submit your selection to UL and learn more.

Education and Training

At UL Knowledge Services, our goal is to help you develop safer, useful products that meet and exceed your customers' needs. Here you'll find a variety of training courses taught by qualified instructors.

Code Compliant LED Retrofits for Luminaires and Signs

9/22/2015 Northbrook, IL

This instructor-led offering discusses market development and growing demand for both product retrofits and retrofitting electric signs with energy efficient LED technology, UL's safety certification program for Luminaire retrofits & retrofit sign kits, different types of Certified & signs retrofit kits available, the importance of sourcing the right kit for the application, installation instructions, and critical marking requirements.

[Learn more >](#)

Find a full list of scheduled public workshops and online courses today at www.ul.com/lightingtraining

Designing LED Luminaires for Compliance to UL1598 and UL8750

10/7/2015 Chicago, IL

This workshop covers the fundamental testing requirements, expected safety performance, and recommended installation practices for Electric Luminaires, including LEDs listed under UL 1598 & UL 8750 and updated to comply with the 3rd Edition.

[Learn more >](#)

UL Hazardous Locations Luminaire and Luminaire Fittings Certification to UL 844

11/12/2015 Brea, CA

In this comprehensive one-day workshop, you will learn about the latest requirements in UL 844, the Standard for safety of Luminaires, and Luminaire fittings for hazardous (classified) locations.

[Learn more >](#)

Human Centric Lighting

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Overall, lighting in schools, homes, and public places can make everyday life more livable and help people achieve a better quality of life. Researchers estimate that LED lights will comprise the majority of lighting spaces by 2020, enabling Human Centric Lighting to become standard in homes, businesses, schools, hospitals, and elsewhere. As such, consumers, manufacturers, and purchasers should explore the positive effects of lighting and how they can integrate the latest human-centric technologies into their environments.

As a company committed to safety, sustainability, and innovation, UL is an active member of the Human Centric Lighting Society and is part of their committee <http://humancentriclighting.org/>.



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