lighting design lab

The Lighting Design Lab is a Northwest utility funded lighting education facility promoting commercial and industrial energy conservation.

NEWSLETTER | SPRING 2013

LED T8 Update: *What Does the 8 Ball Say?*

by Eric Strandberg, LC

The flood of LED T8* products on the market is steadily increasing, as has the number of changes, and opportunities for confusion about the products. The following article will address some current issues about this product type.

UL status - *signs point to yes*

The majority of these LED T8s require disconnecting the ballast and rewiring the sockets. This has led to concern about UL listing of the luminaire after a retrofit. UL has a helpful publication on this topic at www.ul.com (Publications-The Code Authority). Basically it says that a sticker is required (by UL) stating that the fixture is now "UL Classified" as a conversion retrofit. So once the sockets are rewired, someone maintaining the fixture can see that the fixture has been modified.

Wiring consistency - *it is uncertain*

However, not all brands of LED T8s are wired the same way; some wanting power to both ends, some wanting power across the pins, etc. To compound the confusion, many of the wiring diagrams for the LED T8s come from areas of the world where even the symbols used are different than what is conventional in this country. This can make it difficult to have consistent wiring from product to product. Future installations of other products may require the fixture to be again modified for different wiring. Note also, that the wiring for the sockets ("tombstones"), may require that they be converted from shunted to unshunted (or vice versa).

Product performance - *outlook good*

There is good news though. The best of the LED T8 "Kits"** do perform well in terms of quality of light and energy savings. Even though they produce less overall light, as shown in a test that we conducted here, two national brands that I have looked at are almost indistinguishable from the 800 series fluorescents they replace, while consuming less energy. This could be due in part, to the directionality of the lamps, which tend to push the light out of an open type of fixture. Be aware however, this could cause problems in some types of luminaires that are designed for a more omni-directional light source. Lastly, at about $65 each, or more, whether it is a cost effective measure, remains uncertain.

The following chart shows the results of an informal test we did comparing a 2 lamp strip fixture with an instant start ballast (.88BF) with standard, and low wattage fluorescent T8s to 3 different LED T8 products (A and B are the national brands). We are using a 2 lamp T8 striplight as a baseline and it represents the 100% value. Note that the % of energy savings is generally increasing faster than the % of light loss, which is another promising trend.

Description	2 lamp wattage	% energy savings	% light output
T8-835-32watt	60.7	0%	100%
T8-835-25watt	49.4	19% less	15% less
LED-A-20watt	39.1	35% less	27% less
LED-B-22watt	39.0	35% less	39% less
LED-C-17watt	33.2	45% less	37% less

LED T8 in testing chamber. Note the light only comes out of the top.

*LED T8s are marketed as replacements for fluorescent T8 lamps. They are usually 1" diameter tubes with a row of LEDs running down the length, with medium bipin (G13) bases at each end.

**The DLC has redefined this class of product as a Kit; see www.designlights.org for details.

In this issue

More Lighting Guides!

Check out our website for more in our series of Lighting Layout Guides.

www.lightingdesignlab.com

Morning Class: 10:00 am — 12:00 pm (see fees below)

Large Volume Spaces: A Design Approach for Lighting Retrofits

Instructor: Jeff Robbins, LC, MIES

As the interest in ever lower power densities becomes more focused, lighting industry professionals are looking for tools to aid them when designing industrial spaces, big box spaces, gymnasiums and parking lots. This intermediate level class provides methods to maximize energy savings in existing buildings and new construction. By combining multiple low cost strategies in an integrated way, increased energy savings and a high quality visual environment can be achieved. This class demonstrates through computer models and practical examples a clear path to meeting aggressive energy savings goals. Note: As this is an intermediate class, basic lighting knowledge is suggested.

Jeff Robbins is a Commercial Lighting Specialist at The Lighting Design Lab. Before joining the Lab in 2008, he owned and operated his own lighting design firm completing jobs domestically and internationally. He is also the Chair of the Testing Committee for the National Council on Qualifications for the Lighting Professions, (NCQLP) where he earned his LC (Lighting Certified) credentials.

Lunch: 12:00 pm — 1:00 pm (included in registration)

Afternoon class: 1:00 pm — 3:00 pm (see fees below)

Office Buildings: A Design Approach for Lighting Retrofits

Instructor: Eric Strandberg, LC

This intermediate level class, enables professionals in the lighting industry to achieve ever lower power densities in a variety of office spaces including garages to maximize energy savings in existing buildings and new construction. By combining multiple low cost strategies that integrate modern lighting, controls and daylighting opportunities, increased energy savings and a high quality visual environment can be achieved. This class demonstrates a clear path to meeting aggressive energy savings goals through the use of computer models and practical examples. Note: As this is an intermediate class, basic lighting knowledge is suggested.

Eric Strandberg has been one of the Lighting Design Lab lighting specialists for over fifteen years and has over twenty five years in the lighting industry. In 1995 he came to the Lighting Design Lab in an effort to promote energy efficiency and quality lighting design. This work includes; developing and teaching classes, writing articles, new technology evaluation and project consultation, on almost every aspect of lighting design and conservation.

Class locations and dates

Everett, WA	Tue., Mar. 12th	Snohomish Co. PUD; 2320 California St, Everett, WA 98201
Boise, ID	Tues., Mar. 19th	Idaho AGC; 1649 West Shoreline Drive, Boise, ID 83702
Portland, OR	Wed., Mar. 27th	AIA Portland; 403 NW 11th Ave, Portland, OR 97209
Bellevue, WA	Wed., Apr. 3rd	Residence Inn; 605 114th Ave SE, Bellevue, WA 98004
Tacoma, WA	Wed., Apr. 10th	Courtyard by Marriot; 1515 Commerce St, Tacoma, WA 98402
Seattle, WA	Wed., Apr. 17th	Lighting Design Lab; 2915 4th Ave South, Seattle, WA 98134

Class fees

Standard registration	$30 per class (lunch included)
Employees of sponsoring organizations	$10 per class (lunch included)
Students (with valid university/college ID)	$10 per class (lunch included)

Register at www.lightingdesignlab.com. Registration and payment are required in advance.
For assistance, contact us at *206-325-9711 x0 or info@lightingdesignlab.com*

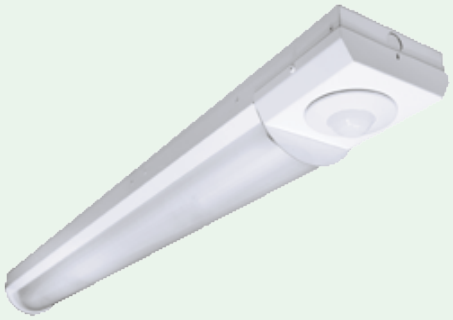
Off-State Power

by Jeff Robbins, LC, MIES

Off-State Power is the amount of energy consumed by an electronic device even though it is in a powered off state. Included among which are those LED fixtures having on-board controls, such as a switches, dimmers, occupancy sensors, motion detectors, or photo-sensors. Using a conventional switch, when the switch is off, the electrical circuit is broken and no power is consumed. In modern electronic switching circuits, a fixture can be off, while a small amount of electricity, known as 'phantom power' is still being used to keep the on-board device operating.

This power state, which is often overlooked but can significantly reduce system efficacy, occurs when one or more of these electrical components are positioned between the power supply and the LEDs. When wired in this manner, the fixture will continue to draw power even when the LEDs are off. That power can be in excess of 2 watts, and the resulting total cumulative losses can represent as much as 2% of a system's total load.

Off-State Power consumption is eliminated in some LED fixtures powered directly from line voltage. In that case the power stage is integrated into the fixture's electronics and is therefore located 'downstream' of the system's devices which require or can control the power side of the circuit. Some poorly designed fixtures consume almost as much power in the "OFF' state as they do in the "ON" state.



Pictured here is a typical fixture that features an on-board occupancy sensor. Courtesy: Columbia Lighting

LDL Services

The Lighting Design Lab reaches out to decision-makers on commercial and industrial lighting projects in the Pacific Northwest territory. Our technical staff will work one-on-one with you to discuss and demonstrate lighting strategies suited to your commercial or industrial project. Confirm your lighting ideas, try out new equipment and find appropriate, energy-efficient lighting solutions for your needs.

- Lighting designers
- Specifiers
- Architects
- Interior designers
- Engineers
- Contractors
- Facilities managers
- Building operators

The LDL also offers classes, facility tours, a demonstration area, mockups, and an extensive library of books, product catalogs and industry reference materials. We maintain the LDL LED Qualified List, making the Lab the gateway for manufacturers seeking to have their products approved for regional utility rebates.

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(left) Light meter in our lighting history case. (right) Clients and staff viewing a recent lighting mockup.

Stay tuned for a new LDL brochure

Learn all about who we are and what we do in the new and improved informational brochure for the Lighting Design Lab due out later this year.

Don't forget to keep up with the latest in efficient commercial and industrial lighting. "Like" us on Facebook or contact us to schedule a consultation or a tour of our facilities.

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