

2013

Top 10 LED Architectural Lighting ~~Myths~~ Illuminated

The latest scoop on architectural LED lighting facts.

Published by

vode

WHY?

Every day it seems we hear myths or out-of-date data presented as relevant facts when lighting specifiers are trying to order LED lighting.

To clear the air for you, we're updating some of the myths and obsolete facts that we hear most frequently.

MYTH

LED lighting is more expensive

FACT

LED lighting can save a fortune

1

This has been a very green thorn in many architects' and lighting designers' sides for years, but LED system costs are now on par and increasingly below equivalent fluorescent system alternatives. In 2012, some experts were still touting the fact that LEDs typically cost 2-times more than typical fluorescent options. Today, the switch has definitely been flipped (pardon the pun).

Steve Nadel, the executive director of the American Council for an Energy-Efficient Economy, told the Scientific American that new and well-designed LED products will continue to accelerate cost-savings due to energy efficiency. It should be noted that dimmable ballasts for fluorescent lighting systems are much more difficult to install, and costly which means fewer savings passed on to the consumer.

For incandescent lighting it's no contest. "Even at 50 cents a bulb, you need 25 of these for every LED, and the operating costs is one-fifth,"

—Steve Nadel executive director of the American Council for an Energy-Efficient Economy

Fluorescent vs. LED cost comparisons*

Product costs for equivalent 16' linear lighting systems.

TYPICAL LINEAR FLUORESCENT SYSTEM

(8) T8 bulbs (2) dimming ballasts

0%
savings

LINEAR LED BOXRAIL 107

(4) 4-foot rails) (4) 0-10v, 1% dimming ballasts

savings

LINEAR T5 FLUORESCENT BOXRAIL 105

(4) 4-foot rails) (4) 0-10v, 1% dimming drivers

16%
savings

LINEAR LED BOXRAIL 107

(4) 4-foot rails) (1) 0-10v, 1% dimming drivers

27%

*Based on list prices to the specification trade for a Vode BoxRail system, July 2013.



MYTH
FACT

Lighting designers are valuable primarily on large projects
LED technology makes lighting designers essential

2

CANDELA
EFFICACY
INTENSITY
TOTAL FLUX
CCT WATTS
CRI DALI L70
CHROMATICITY

Like any other service - your doctor, interior designer or hair stylist - contacting a professional is a much better option than going without an expert. The current industry boom has made it a challenge to stay on top of all trends Hiring a professional lighting designer can save money and make the space shine.

The lighting industry is rapidly changing due to LED and solid state lighting technologies and hiring a professional that is on top of the latest developments can take your project one giant step forward. In addition to making the spaces and structures more aesthetically pleasing, you will likely save on energy costs, increase occupant comfort and possibly boost worker productivity.

And by the way, the best way to avoid LED lighting project re-dos requires the services of a qualified lighting designer.

MYTH

FACT

LED color quality is substandard

LED color now can beat human eye detection

3

Say goodbye to those blue-tinted LEDs - no more washed-out, alien-like skin tones! In the past, manufacturers struggled to produce LEDs with consistent color. Today, color consistency and quality has definitely improved (thank you, well-developed LED color binning!). With new yellow phosphor compounds and conversions, softer and warmer lights are possible with LEDs.



Now, architects don't have to sacrifice color quality for energy efficiency. Manufacturers can effectively produce diodes with color temperature output within three MacAdam ellipses, exceeding what the eye can detect, to meet the demands of just about any lighting designer. Whether you want warm white, - or the whole color spectrum with RGB – LED color capabilities cater to the project's needs and goals.

MYTH
FACT

Retrofitting with new LED lighting is pricey
Retrofitting can be wasteful compared to *relighting*

4

The **retrofitting** transition from incandescent to LED lamps could become more expensive to people who think in the short-term. Sure, the ticket price on LEDs might seem steep at first. However, the lifespan of these LED lighting systems saves utility costs, and is a much smarter choice for those thinking in the long-term. Where will your fluorescent lamps be in ten years? How many will you have replaced in that time?

Retrofitting = short-term savings.



Retrofitting is about the replacement of parts.

Relighting = long-term savings.



Relighting involves redesigning and replacing the lighting systems.

Cheap incandescent or even fluorescent lamps aren't just bad for the environment - they also don't last as long, are less attractive to the eye and use much more power. In fact, A19 LED lamps can last for over to 25,000 hours - or about 10 workweek years. When was the last time your incandescent or fluorescent lighting did that?

So, you should really think of *relighting* rather than *retrofitting*.

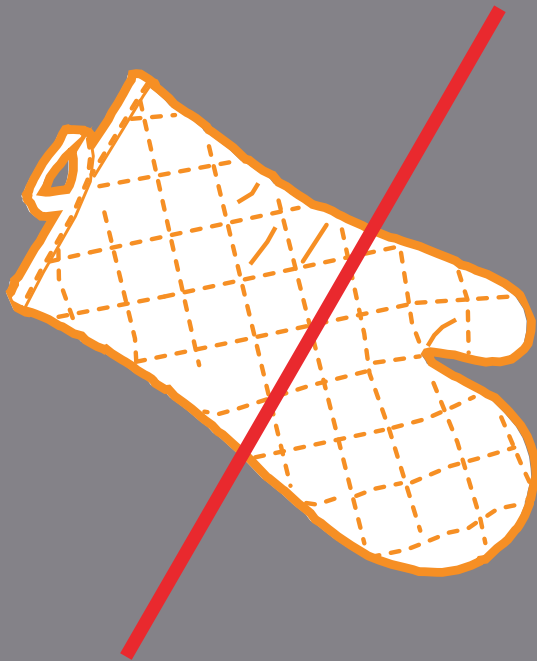
MYTH

FACT

LEDs have heat distribution problems

LED heat challenges are being conquered

5



While incandescent and fluorescent bulbs lose energy as heat, LEDs stay cooler, using energy more efficiently to light the space. However, LEDs are running cooler with some technological and recent product design innovation.

While this may have presented challenges in the past, more efficient LEDs, smarter, lighter and more open fixture designs and aluminum boards have dramatically helped distribute heat in LED lighting systems. Fixture designers are constantly coming up with smart ways to effectively cool down their installed systems often combining multiple techniques to get surprisingly effective results.



MYTH

LEDs have glare problems...

FACT

Only when mis-specified or misdirected

6

The brightness of LEDs can be too dim, too bright or both when, for instance, an LED fixture designed for display lighting is used for general lighting in a retail, office or residential space. As usual with LED innovation, the devil is in the details. Using incorrectly designed or specified lighting systems or fixtures can result in too much brightness or poorly considered sight lines.

Lighting manufacturers who focus on quality often create lighting with lenses, reflectors, baffles and more; all designed to defuse or redirect LED light and move intense light from occupant sightlines. The use of dimming and control systems in both commercial and residential structures can also give occupants more freedom and control when it comes to lighting their space.

Bottom line: The right materials, accessories and control (power) adjustments can easily make LED glare a non-issue. It just requires a little homework and lighting design!



MYTH

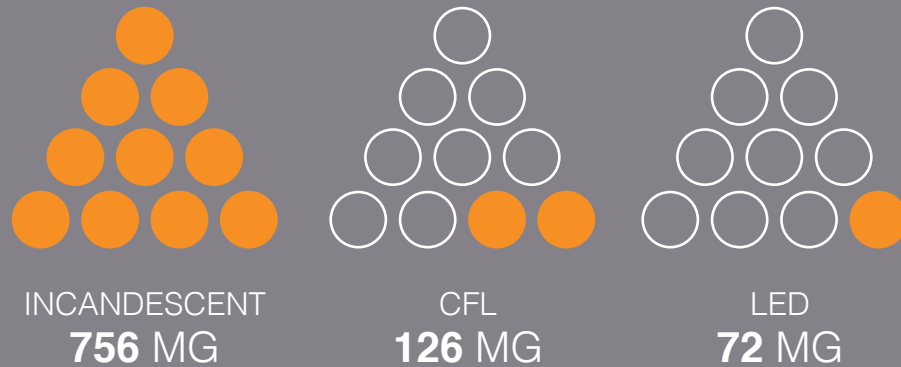
LEDs use dangerous toxic materials

FACT

Toxic levels are generally safe but require proper disposal

7

MERCURY RELEASED OVER A **35** YEAR PERIOD



Toxicity in LEDs is so miniscule that they are permitted in landfills.

However, special handling sounds like a good idea.

One of the biggest challenges that LED manufacturers face: many of their lighting sources may not be 100 percent toxic-free. There are trace amounts of materials found in LEDs, but in reality, LEDs have fewer toxic substances than other mainstream lighting technologies.

In fact, the level of toxicity in LEDs is so miniscule that they are permitted in landfills. By comparison, fluorescent lamps carry about twice as much mercury as LEDs plus other toxins and will produce 3.5 times as much landfill, and those classic incandescents? Thirty-five times as much! In 2013, LEDs toxicity levels are dropping, and many LED lamps are now entirely mercury-free.

MYTH

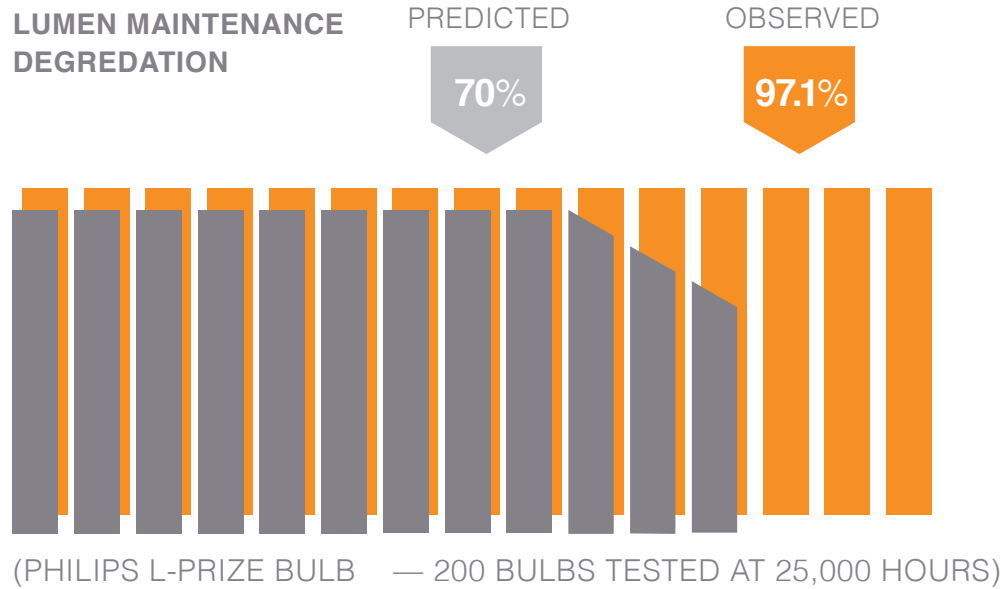
LED lifespans are exaggerated

FACT

LED lifespans are exceeding optimistic predictions

8

In a span of just two years, LED's have made huge evolutions in terms of lifespan. Experts in the field predicted that an LED board could light up a room for 25,000 hours at up to 70 lumen maintenance—the industry metric how long it will take for brightness to drop to 70% of it's initial levels. Not only was this goal bested within two years, these tested samples are actually delivering light currently at 97.1 lumen maintenance.



The fact is, LED lifespan is not only often understated; its incredible longevity is outpacing the expectations of those who work in the field. This shows that, through innovation, energy efficiency, thermal management and clever fixture and system design LED technology continues to outshine the expectations of industry critics.

MYTH

FACT

LEDs have a negative global environmental impact

No other artificial light has less environmental impact

9



The Department of Energy's 2012 report showed that LEDs were **much friendlier** to the environment than the fluorescent lighting and incandescent alternatives.

Currently, both modern fluorescent and LED lighting fixtures don't take much energy to run. However, LEDs produce significantly less waste during manufacturing - meaning less CO₂ released into our atmosphere.

The DOE predicts that LED lighting will cut energy consumption by nearly half by 2030, so these lamps are clearly the future of lighting design. As for LEDs, there really is no contest - they only produce a mere 0.4 tons - yes, that's less than half a ton.

CO₂ emissions for the average US household over 25 years.

MYTH

FACT

Bigger LED fixtures are better

Bigger is better for makers, not necessarily for everyone else

10

In a country where bigger seems better, it's hard to believe that smaller LEDs are actually much better. Shouldn't new lighting design take advantage of the latest LED technology opportunities?

LEDs take up less space in your home, office or public building. Small fixtures can last longer and blend into its environments much more easily - putting the focus back on architectural aesthetics and performance. Smaller fixtures also allow for more efficient heat management, which is destructive to LED components.

Secondly, smaller fixtures use less energy doing the same job as traditional lighting. Long story short, they reduce utility bills and negative CO2 impacts on the environment.

Lastly, low profile fixtures require fewer materials to produce, less energy to transport and create less eventual waste in landfills —and some use materials with up to 90% of their weight being recyclable.



MYTH

LEDs just create more waste

FACT

LEDs reduce waste destined for landfill

11

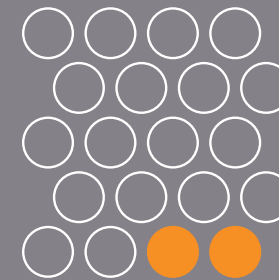
The DOE predicts that LED lighting will cut energy consumption by nearly half by 2030, demonstrating that these lamps are clearly the future of lighting design. In 35 years, 700 incandescent bulbs in an average household will go into landfill, and 70 of the more efficient (*and more toxic*) CFLs. As for LEDs, there really is no contest - only 20 “bulb-equivalents” will be disposed of with minimal levels of toxic materials.

Clearly, LEDs are naturally a much better choice for, well, nature.

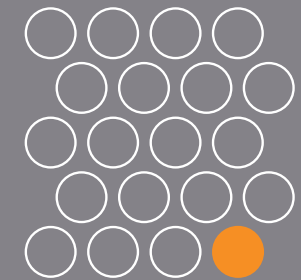
LAMPS DISPOSED OF IN LANDFILL OVER 25 YEARS.



INCANDESCENT
700 lamps



CFL
70 lamps



LED
20 lamps

Lighting usage for the average US household over 25 years.

SOURCES

We're here to help with responsible lighting and more...

For more thoughts on professional architectural lighting we invite you to visit **Vode.com/Blog**.

For info on Vode and its adaptive linear lighting systems visit **Vode.com**.

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