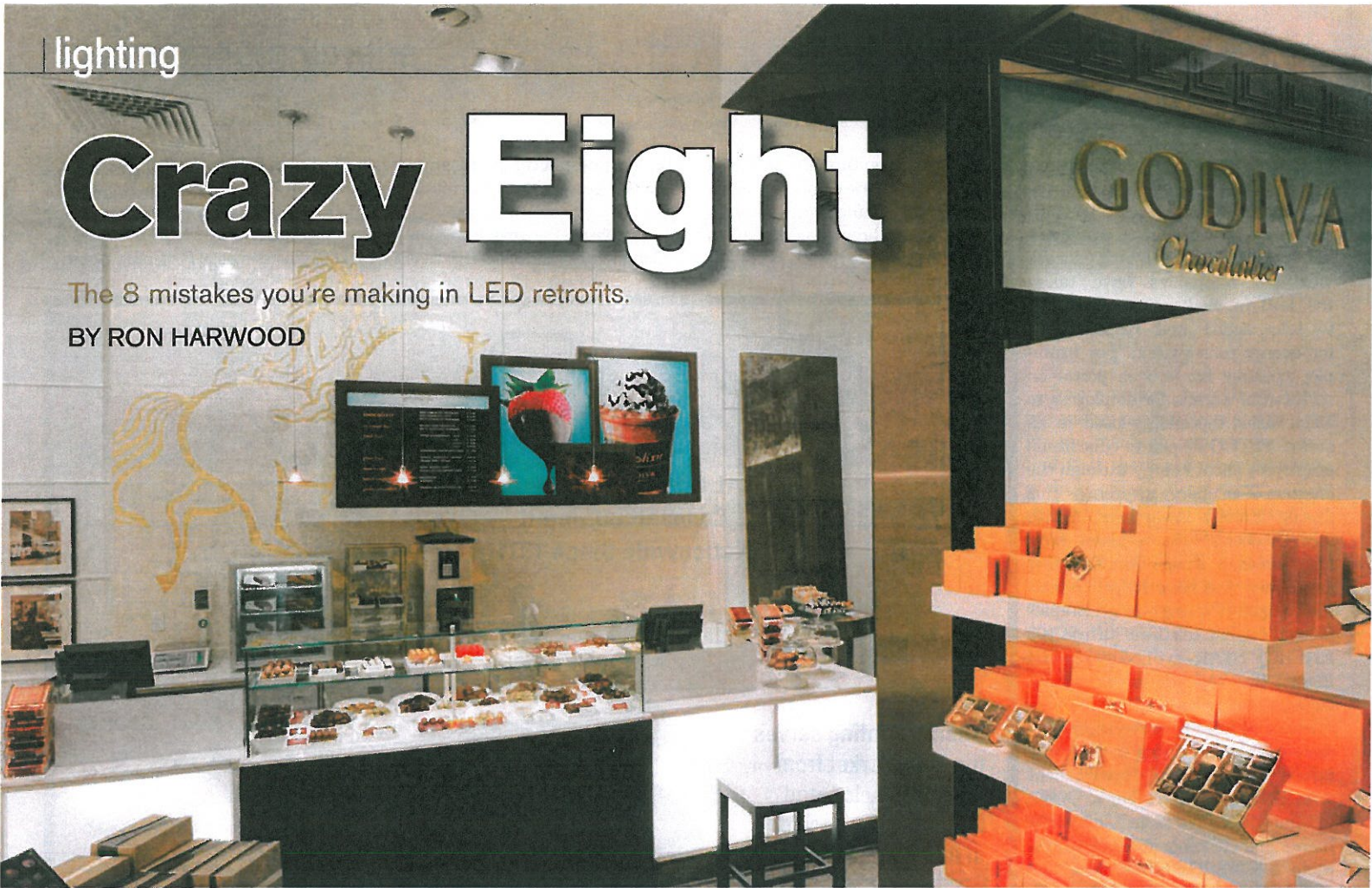


# Crazy Eight

The 8 mistakes you're making in LED retrofits.

BY RON HARWOOD



We have all seen the salespeople come through the office claiming to have the answer to our lighting energy and efficacy concerns. Virtually every pitch will deal with LEDs, with only a few touting the older fluorescent and the new metal halide lamps.

But some salespeople have omitted key facts, or perhaps they have had so little training that they only know how to sell what's in their bag, with little clue about the real facts of their product's performance. More importantly, few salespeople truly appreciate the factual, functional and financial realities of an LED retrofit. Fewer still have the ability or the motivation to explain those realities to a potential customer. I believe that LEDs will eventually become a significant — if not dominant — light source; but as with many new or revolutionary products, they are often misrepresented and misunderstood.

One of the best ways to go “beyond the brochure” and understand what LEDs can and cannot do is to familiarize yourself with some of the most common mistakes people make when engaging in an LED retrofit.

## THE 8 MOST COMMON MISTAKES AND MISCONCEPTIONS SURROUNDING LED RETROFITS:

### 1. Expecting Immediate ROI

The common sales pitch — “LEDs consume less energy, saving you money in the long run!” — is not so much incorrect as incomplete. Depending on your lighting needs, a positive return on investment may not be realistically achieved with LEDs — at least not within the first several years. It is very possible that by the time a positive ROI is achieved, those LEDs may need to be replaced. In general, the quickest payback in the retrofit market is when you can accurately replace an incandescent or quartz lamp as long as there is an acceptable color rendering and brightness. You must be sure to test a few lamps as they can vary in color depending on how well the LED chips have been sorted. There are many examples of LED light sources saving four to six times more energy than incandescent lamps; you just have to be very cautious on going about the process. Determining the actual payback in retrofitting to LEDs can be a bit challenging to ascertain. Depending on how the replace-

ment costs are calculated, the potential 40% savings on electricity typically achieve a positive ROI after 5 to 7 years. Two factors to consider, though are: How long does the lamp need to burn each day? And, can a timer or occupancy sensor help save energy?

### 2. Sacrificing Aesthetics

Simply swapping in LED bulbs will not necessarily achieve the same aesthetic impact. The visual and luminance ramifications of an LED retrofit must be considered carefully, and anyone considering an LED retrofit should ask themselves if they are willing to sacrifice effect in the display window or on the showroom floor. Generally, the most efficient and least expensive LEDs to manufacture are physically small and have low wattage consumption, typically one to three watts per chip, and they produce between 80 and 120 lumens per watt — in theory. Placed in light bulb “envelopes” or installed in fixtures, these LED sources emit more like 40 to 80 lumens per watt, so they are essentially the same or even slightly lower in light production efficiency than fluorescent and metal halide. What's being missed in promoting LEDs is in the area of usable light — the amount of light that actually escapes the light fixture and becomes usable within a space. This calculation is in contrast to the raw efficiency of the light source in open air.

### 3. Forgetting Safety

LEDs heat and cool differently than incandescent bulbs. Safety is always a concern when dealing with lighting and electrical systems, and professional guidance should be a part of any LED retrofit to avoid creating a fire hazard. Because higher efficiencies for LEDs are achieved with lower wattage chips, commercial replacements typically entail several chips clustered near one another to produce the same amount of light as traditional bulbs they are



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replacing. It may take approximately 26 one-watt LED chips to effectively replace one 39-watt metal halide lamp, for example. When manufacturers place this many chips close together, the heat produced by the tightly knit grouping becomes significant enough to require large aluminum "heat sinks" behind the chips. In addition, because many fixtures have not been listed by an accredited testing agency such as Underwriters Laboratory for use with an LED lamp, it is important to check with your inspection authority before simply replacing old PAR lamps with LEDs. Making sure that the LED lamp replacement has a UL or ETL label is the very least safety measure one must take.

#### 4. Thinking You're Green

To achieve the same visual effect, you sometimes need many more LEDs — and the same amount of energy — to maintain the user experience you want. Try not to spend too much green in a misguided attempt to "go green." Additionally, some LED lamps cannot be dimmed, eliminating a potentially valuable source of energy savings. It is wise to be cautious when replacing lamps in track heads or recessed lights where there are already dimmers on the circuit, or if you wish to add dimming in the future.

#### 5. Discounting Replacement Costs & Maintenance

An LED retrofit comes with its own unique set of potentially expensive and confusing replacement costs and ongoing maintenance demands. These considerations are all too often not factored into the cost-benefit equation. Many LED linear sources require a special remote power supply to convert input voltage to something different on the output side. But because the power supply itself typically lasts on average 7 years, many LED retrofits fail to account for the likely expense of a costly replacement by a qualified electrician within the next 5 to 10 years. In addition, because LED manufacturing techniques continue to evolve and improve, color and light output of future replacement fixtures can be a concern. As a result, accurate "matching" of LED products is potentially very difficult, and future replacements or upgrades may become more comprehensive and costly than anticipated.

#### 6. Buying the Hype

LED manufacturers promise energy efficiency and ROI, and while both are possible, neither is certain. Currently, with many commercial

spaces illuminated with fluorescent tubes of some form (many of which were not designed to dim), the prospect of potential energy consumption reductions and corresponding savings are understandably appealing. LED retrofits are touted as cost-effective, environmentally friendly, money-saving alternatives — the same or better lighting quality at a reduced cost. As we have seen

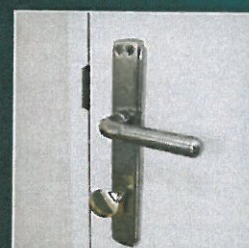
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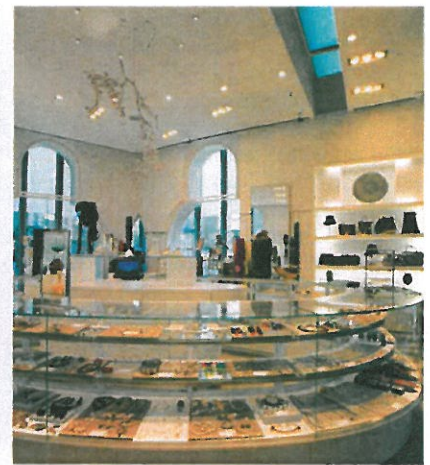
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however, the realities are more nuanced and complex. From a lighting quality and functionality standpoint, LED's ability to live up to the hype depends entirely on how, where and when they are used. And from an ROI perspective, the decision to retrofit with LEDs is heavily dependent on variable individual circumstances. If a retailer has to demo the ceiling in five years (as part of a mall tenant improvement, for example), any energy savings ROI must occur before the lease requires a total refit.

*7. Retrofitting the Baby and the Bathwater*

An LED retrofit does make financial and aesthetic sense for some applica-

tions within a retail environment — but not in all instances. That doesn't mean you either switch everything to LEDs or don't do it at all, it means that I recommend a case by case analysis. The science is incorporating LED when and where it makes sense, and using other energy-efficient lighting sources where they do not. When applied to areas where the lighting tasks and the light source can be within a few feet, LEDs are the best way to go. Under shelves, in display cabinets, ceilings 9 feet or less, for night lights and emergency lighting, and especially in coves, LEDs can absolutely be the right choice. Showroom lighting, window displays and even some parking garages — this is typically not the case.

*8. Assuming the Future is Now*

LEDs may soon be a near perfect lighting source, as they are now being billed. But the technology still has a long way to go to be a lighting panacea. In the near future, we will likely see raw LED efficiencies higher than 120 lumens per watt and usable light in the area of 80 lumens per watt. This potential is what makes LEDs so interesting as the source of the future.

Please know, I am not necessarily against the use of LEDs in commercial spaces. When wisely specified and properly installed, LEDs can be a very effective means of lighting, providing many design opportunities that did not exist before LEDs were commercialized and helping to do their part to reduce our carbon footprint. But like any other new change in technology, we need to be cautious and use common sense so that our hard-earned dollars burn the least amount of coal and get the most light for our investment. Avoiding these common mistakes can help ensure that your LED retrofit does exactly that. **RFB**

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