

TRADE ARTICLE

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Retail Lighting Revolution – Part One: Replacement Lamps

Retail lighting uses as much energy as all other commercial lighting types combined. There is one major reason for this – **display lighting**.

Of course, when we think of display lighting, we think of track lighting systems, which are commonly used in stores of all types, from grocery stores to boutiques. Throughout Wisconsin, the majority of display lighting equipment on tracks and in recessed accent lights employs halogen lamps. The most common lamps in service are PAR38 projector lamps, followed by MR16 low voltage lamps and PAR30 projector lamps.

What has made these lamps popular is low cost and great value. A quality PAR 38 halogen lamp of about 75 watts can be purchased for about \$5 to \$8 and it will last about 3,000 hours. It can be installed in a \$15 simple track fixture, and can deliver 1,100 lumens of light at 3000K and >97 CRI. Beam quality is good, and there are hundreds of fixtures of various designs and costs that use the lamp. For the last decade, the only way to be more energy efficient was to use metal halide options, which cost much more.

Now there are replacement lamps for these three popular lamp types using LEDs:

- PAR38 lamps operating around 20 watts can replace halogen PAR38 lamps up to 75 watts (60 watts IR/HIR/IRC) with no loss of performance. Moreover, the LED lamp will last 25,000 hours or more, and at \$40 per lamp, will cost about the same as 8 halogen lamps that will be needed over the same 3 to 6 year period. The energy savings will be 67 to 73%, and the payback period will be about 28 months.
- MR16 lamps operating around 12 watts can replace halogen MR16 lamps up to 50 watts (35 watt IR/HIR/IRC) with very little change in performance and often offer better color quality. Also lasting 6-8 times as long as most MR16 halogen lamps, the \$35 LED will also cost about the same as the halogen lamps would cost over the same period, and will save 75% of the energy, with a payback period also of about 28 months.
- PAR30 lamps, also operating around 12 watts can replace halogen PAR30 lamps up to 15 watts (40 watt IR/HIR/IRC) with no loss of performance. Like the other lamps, the cost of the PAR30 (\$35) will be equal to the cost of 8 halogen lamps over the same 3 to 6 years of retail use. Also with 75% energy savings, the payback period of PAR30 lamps is about 24 months.

LED replacement lamps are commonly available in 2700K (very warm) and 3000K (halogen-like) color, and there are a few products at 3500K (neutral) and 4000K (cool). Neutral and cool color lamps are often used for store windows and for highlights of certain types of merchandise, especially produce and jewelry. Keep these choices in mind, but remember it always looks best if the general lighting system and the LED display system are close to the same color. Also, remember that the atmosphere of the store will change if you change the color temperature, so if you were using halogen before, 3000K would be the logical choice.

Color rendering index (CRI) is the common measure of color quality. Most commercial LED lighting products have CRI between 80 and 85, which is OK for general merchandise. But for products with strong and vibrant colors, such as fruits and vegetables, clothing, artwork and housewares, consider LED's with CRI 90 or greater. These lamps will cost more and be a little less efficient, but when color sells the product, they often outshine lower CRI lamps.

Next, be sure to investigate lamps with good beam control. Most retail display lighting demands lamps with the following designations for their beams of light:

- Narrow spot (NSP) and spot (SP), for feature displays and for highlighting individual small objects. Narrow spot lamps are less than 12 degrees, and spot lamps are between 12 and 15 degrees beamspread.

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- Narrow flood (NFL), the most common retail display beamspread, is typically used to light individual medium size objects and feature displays, or groups of products in racks or on tables. NFL lamps are between 20 and 25 degrees beamspread.
- Flood lamps (FL), the second most common display lamp beamspread, is used to light larger individual objects, large displays and larger groups of products. FL lamps are typically between 30 and 40 degrees beamspread.
- Wide flood (WFL) lamps are much less common, and usually are used for soft fill lighting with beamspreads of 50 degrees or more.

There are some lamps whose low price is attractive, but their color and beam control is lousy. Be sure that the lamp you buy performs as well as what you already have. And don't believe someone who says that their 10-watt lamp works the same as a 20-watt lamp. There are no technologies that can do this without a big dose of dishonesty, and remember, a lot of LED products are not honestly marketed.

All LED replacement lamps products work wonderfully in open track fixtures. But closed back track heads and recessed fixtures may cause the LED to get too hot. Be sure to confirm thermal compatibility with the manufacturer before buying LED replacement lamps. (As a special hint, especially with the PAR 38 20 watt class, weight matters, and the heavier lamps will generally address heat better.) Also, be sure that if dimming is used, that the LED will dim properly on your system.

Dedicated LED display lighting products also deserve your attention. They can provide even better performance, with products up to 45 watts that can replace halogen lamps as high as 150 watts. Dedicated fixtures do not have replaceable lamps, so they look better, and because they have better drivers and heat sinks, they offer much longer lamp life (50,000 hours or more). For retailers with 24 hour operations, such as grocers or convenience stores, dedicated LED display lighting fixtures may be a better choice, and although they might have a longer payback, reduced relamping and other costs may make them a better investment.

Finally, make sure you are making a good investment. Test sample lamps and choose carefully. In addition to good appearance and satisfactory performance, make sure you have a warranty for at least 3 years from a company or vendor you can trust. The best products will also offer a color maintenance warranty, because the color quality of cheap products often drift and start having weird color after a year of operation. As for price, the costs given above are current prices for responsible products. Be wary of products costing a lot less. But the cost of these important lamps is expected to drop, so be sure to get pricing from a number of possible vendors. I recommend starting your research with products from the major lamp companies before investigating products from other vendors and distributors, as the major lamp companies and a few premium specialty vendors should be your cost and performance reference points.

Focus on Energy provides exciting incentives for using LED replacement lamps as well as dedicated LED display lighting fixtures.

Next month: Other retail applications for LED lighting.