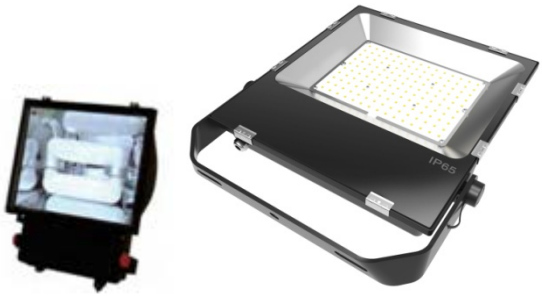
LED vs. Induction Lighting

With so many different types and varieties of lights on the market, choosing one to best suits your specific needs can be downright confusing. Not only do you have to compare prices, but you also have to contend with watts, lumens, CRIs, energy efficiency, and a whole gamut of other descriptors. We decided to simplify the process for you by doing a series of blog posts that provide a side-by-side comparison of lights which often find themselves as competitors in the same application. We're calling this series of posts "Light Fights," and our first pair of lights going head to head is the much hyped LED versus the time tested Induction lamp.

Applications



Because LED and induction lights are long lasting and low maintenance, they are the two most common retrofit choices for outdoor and difficult to access lighting areas. For instance, they are often used in wallpacks, pole lights, street lights, tunnels, parking ramps and in other outdoor systems where it's inconvenient to change bulbs on a regular basis. While there are other types of lights offering quality white light, none have as high a lifespan as these two solutions.

Overview

In terms of longevity, both induction and LEDs significantly outperform regular, other light sources, but how do they stack up against each other? To better understand the differences, let's first discuss the basics of how each light operates.

Light Emitting Diodes (LEDs)

Instead of using a filament (like incandescent) or gas (like CFLs), LEDs produce light through the flow of electrons in a semiconductor material made of positively and negatively charged parts. When an electric charge strikes the semiconductor (i.e. the light is turned on), electrons flow through "holes" in the material from a negative to a positive layer. As the excited electrons pass through the positively charged holes, they create light which causes the LED to illuminate.

Induction Lamps

Induction lamps are somewhat similar to fluorescent bulbs in that they create light by using an electromagnetic field to excite mercury particles mixed in an inert gas. However, instead of using metal

prongs, which often break or become stripped, induction bulbs are excited through a powerful electromagnet positioned outside the bulb. This setup also eliminates the problem of leaky bulbs (common with fluorescents), where outside gasses seep inside and disrupt the balance of inert gasses.

What are the pros and cons of each technology? Here's a rundown…

Induction & LEDs Compared

	Induction	LED
Energy Efficiency	Up to 90 Lumens/Watt	Up to 120 Lumens/Watt and improving
Durability	Heavy-duty – has no electrode or filament, shock & vibration resistant	Heavy-duty – has no electrode or filament, shock & vibration resistant
Lifetime	100,000 hours at R50	100,000 hours at L70
Lumen Depreciation	35% by rated life	30% loss at rated life
Cold Tolerant	- 40 F (may require warm up time at low temperatures)	-30 F (instant on)
Performance	Turns on instantly, no flickering or glare	Turns on instantly, no flickering
Color Temperatures	Multiple Options (2700 to 6500 Kelvin)	Multiple Options (2700 to 6500 Kelvin)
Color Rendering	Average 80 CRI	70 to 90 CRI
Dimmable?	No- unless special ballast	Yes- most
Warranty	3 to 5 years	Usually 5 years
Cost	Moderate upfront cost	Moderate upfront cost

When looking over the chart above, you can see that induction and LED lights are fairly comparable in many areas, but as in all lighting decisions you first need to consider the application. First determine whether your specific application would benefit more from widespread or focused light. LEDs can do both but are excellent are producing one directional light. On the other hand, induction lamps can't pinpoint light as good, but are great at multi-directional uses and illuminating a broad area. Also with LED being a newer technology they don't have as good of options as Induction when looking at a high light level application. Induction lights have lumen packages up to 36,000 lumens whereas LED's have a difficult time getting above 20,000 lumens. That being said LED's produce better Lumens Per Watts than Induction so it's only a matter of time until LED's are capable of producing higher lumen package offerings.

Another factor to consider is how the lumens will depreciate differently over time. For example, Induction lights will depreciate about 65% of their advertised lumens after 60,000 hours of burning time, yet LEDs won't reach the 70% lumen depreciation mark until 100,000 hours. So, with LEDs you'll get a brighter light for longer. One environment factor to consider is the fact that induction lights contain toxic mercury, which means you'll have to take extra steps to ensure they're recycled properly. Also, their UV light may fade or damage certain products. On the other hand LED's contain no mercury and are easily disposed of.

Solution

Induction lighting is a tried and true product that delivers energy efficiency, low maintenance, and longevity but, it's a mature technology, so it's unlikely to see any major improvements in the future. On the flip side, LEDs offer those same things at a similar price point, but all of the lighting manufacturers are focusing their R&D efforts on improving their LED offerings so there will be major advancements in LED going forward. Saying all of that Induction still has it's place for now, but LEDs are better in many applications and at some point will be the choice for most applications when debating between Induction and LED.