Induction Lighting – Best Kept Secret – Dept. Of Energy Website

Induction Lighting: An Old Lighting Technology Made New Again

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Induction lighting is one of the best kept secrets in energy-efficient lighting. Simply stated, induction lighting is essentially a fluorescent light without electrodes or filaments, the items that frequently cause other bulbs to burn out quickly. Thus, many induction lighting units have an extremely long life of up to 100,000 hours. To put this in perspective, an induction lighting system lasting 100,000 hours will last more than 11 years in continuous 24/7 operation, and 25 years if operated 10 hours a day.

The technology, however, is far from new. Nikola Tesla demonstrated induction lighting in the late 1890s around the same time that his rival, Thomas Edison, was working to improve the incandescent light bulb. In the early 1990s, several major lighting manufacturers introduced induction lighting into the marketplace.

Despite its high initial cost, induction lighting has many superior characteristics, including the following:

- Virtually maintenance-free operation
- High efficacy—in many cases, 60+ or 70+ lumens per watt
- Long life
- Excellent color rendering index (CRI)—80+ and in some cases 90+
- Choice of warm white to cool white (2,700–6,500 K) color temperature
- Instant start and restrike operation
- No flickering, strobing, or noise
- Low-temperature operation
- Dimmable capability with some units
- High power factor: .90+

Long Lifespan

Experience with using induction lighting at the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, has demonstrated the long life in actual usage. WIPP's first induction lighting system was installed in 1998, replacing high-pressure sodium (HPS) lights. More than 10 years later, all but three of the original 36 induction units are still operating after more than 88,000 hours of continuous, 24/7 operation. Additional systems were installed in 2002 and succeeding years, both indoors and outside, with excellent results.

Two of the top manufacturers of induction lighting systems have an average rated life of 100,000 hours, including the ballast. Some other manufacturers only rate their ballasts for 60,000 hours, even though the bulb may last longer. Check out the warranties before buying. Some manufacturers offer full five-year warranties on the entire induction lighting system. Others offer shorter warranties on some or all components.

Although they may last 100,000 hours, after 60,000 to 100,000 hours of operation the initial lumen output of many of the induction lighting systems drops to 70%—the point where relamping is often recommended.

Applications with High Potential for Induction Lighting

- In hard-to-reach locations that make maintenance costs high, such as street lighting and tunnels, or in high ceilings where there is continuous operation, such as hotel rotundas
- Cold environments, such as supermarket walk-in coolers and freezers
- Where high-quality lighting is required or highly desirable
- Where reliability is highly valued
- Where high lumen output is required
- In areas that require lamps to reach full illumination immediately.

Saving More Energy with Innovative Controls
Some manufacturers are introducing innovative control strategies for additional energy savings.

Although most units cannot be dimmed, at least two systems allow for full dimming. One company has teamed with the University of California Lighting Technology Center at the University of California Davis campus to demonstrate a bi-level induction lighting system. This system has two brightness levels. In areas such as parking garages, the light remains at half brightness in the absence of occupants and moves to full brightness when an occupancy sensor shows the presence of someone entering the area. (PDF 3.0 MB). Download Adobe Reader.

Utility Involvement in Induction Lighting
Utilities throughout the country are installing and/or promoting induction lighting. For example, many Northwest public utilities are offering incentives. One utility in New Jersey has a program offering municipal customers the opportunity to replace older mercury vapor street lighting fixtures with new induction lighting fixtures.

Environmental Drawback
As do standard fluorescent bulbs, induction bulbs contain a small amount of mercury, although it is in a solid state that makes it less harmful in case of breakage. Nonetheless, dispose of these bulbs responsibly at the end of their service life like fluorescent bulbs because of the mercury content.

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Categories: Lighting |

Comments

Nikola Tesla's lighting induction and Thomas Edison's improving work is out come of today's electricity. new form of old lighting system though costly but seems effective.thanks for their try.
Annuities | October 19. 2009 04:43

With energy costs rising, businesses will be forced to look to induction lighting to help reduce electric and maintenance costs. These fixtures use around 50% less energy and have a 100,000 hour bulb life. Common HID fixtures will eventually become obsolete.
Mike Hemenway | March 14. 2010 12:06

teamed with the University of California Lighting Technology Center at the University of California Davis campus to demonstrate a bi-level induction lighting system. This system has two brightness levels.
Automiete | March 29. 2010 03:30

think about the maintenance cost reductions for such a feature in a street lighting application or an institution like a large medical complex.
michael ng | April 22. 2010 17:04

Thanks for taking the time to share this, I feel strongly about it and love learning more on this topic. If possible, as you gain expertise, would you mind updating your blog with more information? It is extremely helpful for me.
mahabaleshwar hotels | June 18. 2010 02:29

Hello John- I have heard so much about Induction Street Lighting, but cannot find any information on how many US cities have already installed Induction Cobra Head street lights on a large scale. Plenty of small tests but I do not know of one city that has done a large change out. Do you have that information? Cities that have changed to Induction Lighting and how many fixtures have been replaced in the US
John Quart | July 19. 2010 15:54

City of Islip, New York, closed a bid for 5000 street lamps around May. Carlsbad, California, closed a bid for 4000 street lamps back in last November.
michael ng | July 20. 2010 02:28

http://www.eereblogs.energy.gov/energysavers/post/Induction-Lighting-An-Old-Lighting-Technology-Made-New-Again.aspx