

The Edge™ and LEDway™ by BetaLED® Compared to Induction Lamp Luminaires

There are many excellent reasons to select a BetaLED lighting system over one based upon induction technology, even though on the surface induction may look like a good competitor for LED. Some of the main reasons to select LED are as follows:

1. LIFE RATING AND MAINTENANCE

The BetaLED luminaires have predicted operating lives ranging from less than 50,000 hours to more than 150,000 hours depending upon the drive current selected and the ambient temperature conditions. For LED luminaires, the rated life (L_{70}) is defined as the point in operating hours where the luminaire loses 30% of its initial light output. During this rated life, the expected failure rate of the drivers in the BetaLED luminaires is predicted to be less than 0.5% based upon analysis from the driver manufacturer.

Conversely, induction systems fail predominantly due to the failure of the high frequency generator (HF Generator). The failure rate is typically characterized by the manufacturer based upon the case temperature (T_c) of this component. For example, one manufacturer specifies that, at a T_c of 72° C (161° F), at 60,000 hours 10% of the HF generators will have failed and at 100,000 hours, 35% will have failed, on average. For each induction failure it is recommended that both the lamp and the induction generator be replaced because, most likely, the lamp has suffered significant lumen depreciation at that point.

Maintenance of lighting systems is important for both safety and security. All lamps exhibit lumen depreciation over life and at some point fail completely. **With a BetaLED street lighting system, LEDway luminaires, operating at 350 mA in an average night time ambient temperature of 15° C, over 99% of the installed luminaires should require no maintenance for approximately 150,000 operating hours. Even at 525 mA operation, the worst case LEDway luminaire would have less than 1% failures by 69,000 hours of operation at the same 15° C average night time ambient temperature. With the induction system, there will be 35% of the luminaires that will have to be maintained by 100,000 hours of operation. Therefore, a considerably higher maintenance cost with the inductions system.**

2. OPTICAL CONTROL AND DELIVERED LUMENS

BetaLED lighting products have unprecedented optical control. Each LED chip package is covered by a precision formed secondary optic (NanoOptic™), which actually captures and re-directs 100% of the light leaving the LED chip package. The BetaLED luminaires utilizing the NanoOptic™ are able to significantly improve on the typical lighting distributions available today in luminaires using incumbent technologies. This level of optical control delivers lighting projects with more uniform lighting levels with dramatically lower “hot spots” directly under the luminaire. The user gains a better lighting performance with lower average levels of illumination, but with equal or greater minimums. The end result is greater energy savings with BetaLED luminaires over the life of the installation.

Conversely, the induction light sources are fairly large special fluorescent lamps. A large source size requires a much larger reflector in order to provide suitable optical control. However, large reflectors translate into larger luminaire sizes, adding cost, weight and effective projected area to the luminaire designs. Because of these self imposed size limitations on the luminaires, most induction luminaires have poor optical control. The result is a lighting project with poor uniformities typically quantified by unacceptably high maximum to minimum and average to minimum uniformity ratios.

3. BetaLED MODULARITY

BetaLED lighting systems are modular and scalable. Almost all BetaLED luminaires can be sized to fit the lighting needs of the project. The LEDway luminaires can incorporate as few as 10 LEDs in one light bar up to 120 LEDs in 6 light bars. The Beta Edge luminaires utilize as few as 20 LEDs in one light bar up to 240 LEDs in 12 light bars. Induction technology products are limited to only a few wattages and outputs. As an example, Philips only manufactures a 55W, 85 W and a 165 W induction lamp.

4. INDEPENDENT TEST RESULTS

A number of cities have performed evaluations of BetaLED products (and other LED manufacturer's products) against those products utilizing incumbent technologies, including induction, for street lighting applications. This work was performed as part of their due diligence for the selection of a new lighting system. These studies were not run by BetaLED, but by the cities themselves. These were truly independent evaluations. BetaLED products have consistently been selected in these head to head comparisons.