

Disadvantages of Using Corncob and COB LED Lights to Replace Metal Halide in Parking Lot and Garage Lighting

Executive Summary

As the transition toward energy-efficient lighting continues, many facility managers are exploring the use of LED technology to replace traditional metal halide (MH) and high-pressure sodium (HPS) lighting in parking lots and garages. Two common retrofit solutions—Corncob-style LEDs and Chip-on-Board (COB) LEDs—are frequently considered. However, both have significant drawbacks when used to replace MH or HPS lamps in fixtures designed for traditional lighting technologies. This white paper discusses the inherent disadvantages of Corncob and COB LEDs in these applications, highlighting inefficiencies in light distribution, problems related to the use of traditional fixtures, and the superior performance of R9 Lighting's customized solutions, which offer even illumination and cost-saving benefits through sophisticated wireless controls.

The Problem with Corncob and COB LEDs in Traditional Fixtures

Corncob-style and COB LEDs offer high efficiency in terms of lumens per watt but are not well-suited for retrofitting into parking lot or garage lighting fixtures originally designed for MH or HPS lamps. Both LED types share common issues, which result from their light output characteristics and how they interact with fixtures designed for omnidirectional light sources.

1. Inefficient Use of Reflectors in Traditional Fixtures

- **Corncob LEDs:** Corncob LEDs are intended to mimic the shape and omnidirectional light output of traditional bulbs, but their light is emitted from multiple diodes across the cylindrical body, not uniformly in all directions. When placed in a traditional MH or HPS fixture with reflectors, these LEDs do not provide the expected broad, even light coverage. Reflectors, which are designed for conventional omnidirectional lamps, fail to efficiently disperse the light, resulting in dark spots and inconsistent illumination across parking areas.
- **COB LEDs:** COB LEDs, while highly efficient, produce a focused beam of light, unlike MH or HPS lamps that radiate light in all directions. When used in traditional fixtures, COB LEDs are even less compatible with reflectors, as their concentrated output does not benefit from the reflector's design. Instead, light is often directed into a narrow area, causing uneven lighting and leaving significant portions of the parking lot or garage poorly lit.



Figure 1: above represents the outcome of retrofitting with COB LED's. You will notice very uneven lighting with hot spots and dark spaces in the parking area.

2. Glare and Hot Spots

- Both Corncob and COB LEDs, when used as retrofit solutions, often create glare and hot spots. Corncob LEDs' attempt at omnidirectional light fails to fully cover wide areas, while COB LEDs' directional output can create overly bright zones that contrast sharply with surrounding dark areas. This uneven light distribution can lead to safety issues in parking lots and garages, as well as visual discomfort for drivers and pedestrians.

3. Reduced Light Quality for Security

- The uneven illumination created by these retrofit solutions can also impact the effectiveness of security systems, such as cameras. Dark spots or poorly lit areas can reduce visibility, making it harder to monitor these spaces effectively and compromising safety.

Superior Light Distribution with R9 Lighting's Customized Solutions

R9 Lighting offers tailored lighting solutions that address the shortcomings of Corncob and COB LEDs in parking lot and garage lighting. Their lighting systems are designed to provide even, consistent illumination, eliminating dark spots and glare while improving safety and visibility.

- **Engineered for Uniform Light Distribution:** Unlike retrofitting with Corncob or COB LEDs, R9 Lighting's fixtures are engineered with advanced optics that ensure uniform light spread across large areas. This results in even illumination



without the need for inefficient reflectors. Their fixtures are custom-designed to optimize light output for parking lots and garages, where consistent coverage is crucial for safety.

- **Minimizing Glare and Hot Spots:** R9's solutions are specifically developed to reduce glare and avoid the creation of hot spots, ensuring that light is evenly distributed. This enhances the visual comfort for both drivers and pedestrians, creating a safer and more pleasant environment.

Cost-Saving Benefits Through Sophisticated Wireless Controls

While Corncob and COB LED lights may offer some energy savings compared to MH and HPS, R9 Lighting takes efficiency a step further by incorporating advanced wireless controls into their systems. These controls offer substantial cost-saving benefits by optimizing energy use and reducing maintenance needs.

- **Real-Time Control and Dimming:** R9 Lighting's wireless controls allow facility managers to adjust lighting levels in real-time based on occupancy, ambient light conditions, or programmed schedules. This adaptive lighting ensures that energy is conserved when full brightness is not necessary, such as during off-peak hours or in unoccupied areas.
- **Daylight Harvesting:** The integration of daylight harvesting capabilities enables the system to automatically reduce artificial lighting when natural light is sufficient. This feature is particularly useful in open parking structures where daylight can significantly reduce the need for artificial light during daytime hours, further lowering energy consumption.
- **Reduced Maintenance Costs:** Unlike MH or HPS lamps, which require frequent replacements and maintenance, R9's LED systems offer significantly longer lifespans. Moreover, the integrated wireless controls provide predictive maintenance features, alerting facility managers to performance issues before they become critical, reducing downtime and repair costs.
- **Lower Operational Costs:** Corncob and COB LEDs may reduce energy costs compared to MH and HPS, but R9 Lighting's optimized systems, combined with wireless controls, provide even greater operational savings. The ability to fine-tune lighting levels and schedules results in a more efficient use of energy, minimizing waste while maintaining appropriate lighting levels for safety and security.

Conclusion

While Corncob and COB LED lights may appear to be convenient retrofit options for replacing metal halide and high-pressure sodium lamps in parking lots and garages, their use in traditional fixtures leads to significant performance issues. These include inefficient light distribution, the ineffective use of reflectors, the creation of glare and hot spots, and reduced overall safety.

R9 Lighting's customized solutions offer a superior alternative, delivering even, high-quality lighting specifically designed for parking structures. In addition to improved safety and visibility, R9 Lighting's systems incorporate advanced wireless controls that enable real-time lighting adjustments, daylight harvesting, and predictive maintenance, providing substantial cost savings over time.

Facility managers should consider the limitations of Corncob and COB LED retrofit solutions and instead opt for R9 Lighting's comprehensive, optimized systems to ensure better lighting performance, safety, and cost efficiency.



Figure 2: above represents the outcome of retrofitting with R9 Lighting LEDs designed specifically for the project. You will notice very even lighting with few inconsistencies throughout the area.

Figure 3: to the left is a partially completed project that further demonstrates consistent lighting across the areas that have been updated. You will notice the blue area toward the middle of the image. These are 575w Metal Halide lights. The more white areas are illuminated with 275w LEDs manufactured by R9 Lighting. Using sophisticated wireless controls in conjunction with the new LED lights, this client enjoys an 86% reduction in energy related costs.



About R9 Lighting

R9 Lighting is an industry leader in advanced lighting solutions for commercial and industrial applications. With a focus on energy efficiency, uniform light distribution, and cutting-edge control systems, R9 Lighting delivers superior performance and significant operational savings for clients seeking to upgrade their lighting systems.

