

Mogul Base LED Replacement Lamps Evaluated

The rapidly changing landscape of lighting in the U.S., largely due to the widespread acceptance of LED technology, has opened a universe of new possibilities regarding LED replacement lamps. There are 144 million high-intensity discharge (HID) lamps in the U.S., consuming 26% of lighting energy nationwide. HID lamps are used primarily in outdoor applications such as roadways, parking lots and building exteriors, but are also used in commercial interior and industrial applications. Mogul base LED replacement lamps are being marketed as equivalent replacements for incumbent HID lamps.

Replacing HID lamps with LED lamps could potentially provide a substantial reduction in energy use; however, there is a need for objective technical information regarding LED replacement options currently available. In response, the LRC conducted evaluations of LED replacement lamps, most recently, those with a mogul base. For this project, the LRC conducted



An LRC researcher mounts a cobra head fixture containing a mogul base LED lamp for testing inside an integrating sphere.

market characterization and performance testing of mogul base LED lamps to support cost-effective retrofits for high bay, post top, wall pack, yard light, and cobra head applications.

The LRC authored several reports which provide details of the market characterization and pilot photometric testing of 35 representative mogul base LED



lamps in luminaires. The LRC also conducted a comprehensive survey of specifiers to identify key considerations for lamp selection and relevant luminaire performance characteristics for various lighting applications.

The LRC found that 13 of the 35 tested lamp-luminaire combinations met the minimum DesignLights Consortium Qualified Products List criteria for retrofit kits, including decorative outdoor, pole-mounted area and roadway luminaire, and high bay categories. The lamps tested in the wall pack luminaires did not meet the applicable minimum criteria for wall-mounted outdoor luminaire retrofit kits. In terms of application performance, the tested products had to be spaced closely together to meet current lighting requirements and did not allow one-for-one retrofits. Testing of HID lamps in bypassed sockets indicated that some non-protected HID lamps might experience non-passive failure when input voltages of 277V or higher are used. A fast-acting inline fuse was demonstrated to help prevent non-passive failures in a preliminary follow-up study.

Sponsor

Bonneville Power Administration (BPA)



The report is available free to the public at:
https://www.bpa.gov/EE/Technology/EE-emerging-technologies/Projects-Reports-Archives/Documents/Mogul_LED_Lamps_LRC_BPA_Phase1_finalNov24.pdf



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