

Technology Overview: LED Lamps for Mogul-Base Sockets



LED lamps for mogul-base sockets might offer inexpensive, energy-saving LED lighting retrofits.

The following information is based on performance tests performed by the Lighting Research Center for BPA in 2014.

For many applications, new integral LED luminaires will probably provide better lighting performance and energy savings at a comparable price, when compared to mogul base LED lamps installed in the existing luminaires. The wall pack application in particular presents multiple performance challenges for mogul base LED lamps, such as a small lamp chamber with optics designed for HID lamps, and an assortment of mogul and medium base sockets in these types of luminaires.

In specialty applications where existing luminaires have unusually high value, such as decorative streetlights and historical restorations, mogul base LED lamps or kits may have a price advantage over new integral LED luminaires. For example, mogul base cylindrical LED lamps or kits can be used in decorative streetlights, provided that they fit inside the luminaire and provide appropriate light distribution and heat management.

Another potential application is a slowly phased retrofit project to upgrade existing luminaires with LED lamps or kits a few at a time on a limited budget, while maintaining uniform aesthetics throughout the project. A retrofit plan like this should be evaluated after the first few mogul



base LED lamps or LED kits are installed, to confirm that the replacement LED products provide appropriate light for the application.

Some performance risks were identified. One issue is that some “paddle” shaped mogul base LED lamps lack a rotational locking mechanism. In applications with vibration from wind or traffic, this creates a risk that paddle lamps might rotate over time, reducing the light output and changing the light distribution from the luminaire. Some lamps address this risk with design features such as straps, or additional materials such as Loctite. Another issue is performance at high temperatures. Some mogul base LED lamps have a thermal safety circuit that

reduces input power by roughly 20-50% when the lamp temperature rises above a given value. If the temperature inside a luminaire gets too hot, this circuit might reduce the light output unexpectedly. High quality products might only reduce the light output by 20%, which is barely noticeable, but for lower quality products, larger reductions in brightness may be more obvious. Mogul base LED lamps without a thermal safety circuit could fail prematurely at elevated temperatures inside the luminaire.

The Lighting Research Center did not conduct any tests of life performance. The main information available about mogul lamp product lifetime performance is the manufacturer's warranty. At present, mogul base LED kits (that receive power through a wire rather than through the mogul base socket) are listed on the DesignLights Consortium Qualified Product List (DLC QPL). The DLC QPL contains information from an independent third party related to product lifetime performance. Mogul base LED lamps (that receive power through the mogul base socket) are not on the DLC QPL at present. It is unclear whether they might ever be on the DLC QPL in the future. However, some mogul base LED lamps are listed on the Seattle Lighting Design Labs Qualified Product List, which has a requirement for warranty, but does not contain any information related to rated life or lumen maintenance testing.

