Testing & Reporting Requirements for Screw-Base Replacements for HID Lamps

The DLC accepts QPL applications for mogul (E39 and E40) screw-base replacement lamps. UL "Type B" products (with internal drivers that operate directly off line voltage) and “Type C” products (with external drivers that replace the HID ballast in the circuit) are eligible.

UL Type B products, which require removal of the existing ballast from the circuit and the lamp holder to be wired with line voltage, and UL Type C products, which require the existing HID ballast to be replaced with an external LED driver, are eligible.

Screw-Base Replacements for HID Lamps which incorporate functionality to allow a given model to produce multiple beam spreads/optical designs/distributions at or after the point of installation, are eligible under the Field-Adjustable Light Distribution Policy.

The testing and reporting requirements described below are intended to subject the lamps to conditions in typical luminaires in order to assure confidence in performance.

In order for DLC reviewers to verify that the retrofit kit or replacement lamp was tested in an Approved Housing, the housing used for testing must be clearly documented in the LM-79 and ISTMT reports submitted with the application. If the housing used for testing is not clearly documented in the test reports, and the test reports cannot be updated with this information, DLC will require confirmation of the housing used for testing from the laboratory(ies) that conducted the testing.

NON-ELIGIBLE Products

- Dual-mode (products that can operate using either the HID ballast or line voltage) mogul screw-base replacements for HID lamps are not eligible.
- Both medium (E26)–base lamps and lamps that are intended to operate off the existing HID ballast (“Type A” lamps) are not eligible.
- Products that can operate using the existing HID ballast in any capacity are not eligible.
- Products with E39 or E40 base adapters, such as E39-to-E26, are not eligible.

Supporting Documentation Requirements

Applications for Screw-Base Replacements for HID Lamps must provide the following supporting documentation in addition to the standard test data required for all applications.

- **Installation Instructions**

Installation instruction sheets must be submitted with the application to indicate how the lamp will be installed in an existing luminaire in the field. These installation instructions must be the same ones provided to customers and installers in the market.

- **Safety Certification Documentation**

All products are required to submit a compliance certificate from an approved safety certification organization relevant in the United States or Canada. This compliance document shall bear the manufacturers name and will be proof that the products listed have been investigated by the safety organization and found to be in compliance with the standards listed on the certificate. The name of this document varies by safety organization; however, it is commonly referred to as a Certificate of Compliance or Authorization to Mark.

Testing Requirements

All DLC QPL testing and reporting requirements that apply to new luminaires shall also apply to any lamp application e.g.: LM-79, ISTMT, IES file, TM-21 projection etc. (Note that for lumen maintenance testing, the source manufacturer is responsible for the LM-80 test of the LED package, array, or module. A report resulting from this test must be passed on to the DLC by the applicant, as specified in the application instructions.) LM-79 reports for lamps should be submitted directly by the applicant to the DLC.

For testing purposes, DLC specifies typical “reference” luminaire housings for lamp products to be tested in. This is done to provide testing results under common conditions that the lamps would be installed in. In providing this list of typical luminaire housings, DLC does not endorse or exclude any particular make or model frame for use in energy efficiency programs. Note that in each recommended variation, an option for testing in a “Pre-approved Equivalent” is available. Some approved housings can come with medium or mogul sockets. For the purpose of DLC testing, the housing with the mogul socket must be used. All test reports, including LM-79 and ISTMT test reports, must directly state the reference fixture used for testing. The complete model number of the reference fixture must be stated directly, including (where necessary), clarity on the specific socket type contained within the fixture.

In selecting a luminaire for testing, the applicant shall consider the purpose of subjecting the tested lamp to extreme confinement for thermal endurance. If a product demonstrates necessary performance in a given luminaire, the product will be considered qualified in that luminaire and in luminaires of similar types and applications, only. The product will not be considered generically qualified, nor qualified in other applications, unless the product is tested, demonstrates necessary performance, and is also listed on the DLC QPL in that application.

In populating the Application Form during submission, reported data must be representative of the same tested configuration (i.e. reported data based on performance in the reference housing).

Applicants should test and report luminaire performance under the following restrictions and conditions:

Luminaire Level Tests

Lamps need to be tested in (i.e. supply an LM-79, ISTMT, IES file from testing in) only one of the approved luminaires, or a pre-approved equivalent. The option you choose to use for lumen maintenance compliance will determine how many tests you need. If you choose Option 1: one LM-80 report and TM-21 projection is needed per LED package, array, or module as necessary according to the multiple LEDs policy. If you choose Option 2: you will need LM-84 testing and TM-28 projections, with LM-80 testing and TM-21 projections as necessary. Due to the length of this type of testing, it is recommended that the submitter reach out to applications@deisgnlights.org to ensure the testing will align with DLC Testing and Reporting Requirements before beginning any testing using the LM-84 method.

Pre-Approved Equivalents

As noted, DLC does not endorse or exclude any particular make or model of reference fixture. Options listed are intended to illustrate common fixtures of that type. Manufacturers may test in alternative fixtures to those listed, with pre-approval from the DLC. Pre-approved fixtures must meet the following conditions:

Alternative fixtures must be commonly used in the application category intended to be applied for. Documentation may be required to demonstrate fixtures appropriate use if questions arise.

Alternative fixtures must provide similar thermal environments to those listed under each category below. Particularly, alternative fixtures may not be significantly different in internal volume or construction materials. Note: pre-approved equivalent requests will only be evaluated against the approved fixtures listed below. Evaluation will not be made against the list of pre-approved equivalents.

To request that a fixture be considered as a pre-approved equal for testing purposes, please send the spec sheet for the fixture to applications@designlights.org, along with a spec sheet for your replacement lamp. DLC review staff may need additional details, depending on the request and details available in the spec sheet.

Controllability

Per V5.1, all lamps qualified for indoor applications must be continuously dimmable and lamps qualified for outdoor applications must be either stepped or continuously dimmable. Because lamps are most often used in retrofit applications, there are special considerations needed to ensure end users can dim lamps as desired. The following considerations apply to each UL Type of linear replacement lamps, mogul-screw base lamps, and pin-based replacement lamps, as appropriate:

- UL Type A
    - Type A lamps do not need to report Wired Control Communication as wired control signals are received by the fluorescent/HID ballast and not the lamp itself. Type A lamps only need to report dimming capability, dimming range, wireless communication protocol (if applicable) and presence of integral controls. The “Wired Communication Protocol” field on

the QPL won't appear for these products, but the listing will contain a note that says: "Dimmable depending on ballast capability."

- UL Type B
    - In addition to reporting dimming capability, dimming range, presence of integral controls, and communication protocol, Type B lamps that claim to be dimmable via a wired protocol with 0-10V, DALI, and DMX must provide a wiring diagram in the product specification sheet, installation instructions, or separate document showing the electrical circuit of the lamp connecting to mains power, including the location of the input signal from an external control source to the lamp or lamp holder for 0-10V, DALI or DMX control.
    - Type B lamps listed for operations with 0-10V, DALI, or DMX communication control must be able to achieve this dimming capability without an external signal converter and the low voltage control wires must connect directly to the lamp or lamp holders.
        - If an external device is used to receive the 0-10V, DALI, or DMX control signal, then these lamps will be classified as "Wired Communication Protocol: Other Wired Communication Protocol" and should indicate this on the application form as: "Input signal from external control source". The QPL will indicate that these products accomplish dimming via an external accessory with a note that says: "Dimmable via an external accessory". The wiring diagram noted above will be evaluated by reviewers to determine if an external device is required to achieve the specific communication protocol.
- UL Type A/B Dual Mode
    - Type A/B must be dimmable in both modes of operation and stated as such on the product specification sheet.
    - Everything from UL Type A above applies to UL Type A/B Dual Mode. All products will have a note on the QPL that says: "When operated as Type A, dimmable depending on ballast capability"
    - Similarly, Dual Mode Lamps must supply documentation as noted in the Type B section above and will be listed on the QPL as described for Type B lamps. If the Type B lamp accomplishes dimming with an external accessory, it will include a note that is specific to Type B operation.
- UL Type C
    - Type C lamps must meet all V5.1 Controllability requirements with no further considerations.