Certifying Luminaires: Utilizing the Certified Subcomponent Database

With the change to third-party certification and Luminaires 1.0, EPA created the Certified Lighting Subcomponent Database (CSD) to take the place of the NEMA-ALA lamp-ballast matrix to assist luminaire manufacturers with selecting components for ENERGY STAR fixtures. Items listed on the CSD have already been tested for photometric, life and/or electrical performance at EPA-recognized laboratories. Using the CSD can help reduce testing costs and time associated with ENERGY STAR certification process for luminaires.

Component testing for the CSD is performed at lighting laboratories that are recognized for non-directional luminaires in the appropriate technology category, such as fluorescent or solid-state. The specific test methods are listed in the ENERGY STAR laboratory guide, and are the same as those required for luminaries. Thermal testing of the installed CSD components is required to ensure that they do not exceed the operational limits.

Items currently eligible for listing on the CSD:

- **Fluorescent and HID Lamps** are tested on reference ballasts (ballast factor of 1.0) for electrical and photometric performance characteristics, and go through long term testing to satisfy lumen maintenance and lifetime requirements. These pre-tested lamps can be paired with a ballast (CSD listed or otherwise tested by an EPA-recognized laboratory) and in-situ test to meet the requirements for non-standard luminaires. The life and lumen maintenance data can be used in conjunction with luminaire testing to satisfy directional luminaire requirements.
- **Ballasts** are tested to provide information on electrical characteristics (input and output), which can be used to satisfy the appropriate requirements for qualifying luminaires. Life testing is not required for listing ballasts on the CSD.
- **Lamp-Ballast Platforms (Platform)** are combinations that have been tested as a unit for performance. Minimal additional testing is required for non-directional luminaires to qualify using a platform, and part of the information can be used to lessen the testing required for directional luminaires. Performance and long term life and lumen maintenance testing are required.
- **GU24-Based Discharge Lamps** (fluorescent or HID) are similar to Platforms as they provide almost all of the performance data required to qualify a non-directional luminaire, and they significantly lessen the testing required for qualifying directional luminaires. Performance and long term life and lumen maintenance testing are required.
- **LED Light Engines and GU24-Based LED Lamps** are products that have LEDs, optics, driver, thermal components and connectors to make a self-contained LED solution. These are used similarly to GU24 based discharge lamps, in that they provide almost all of the performance data, but their performance is calculated as a function of stabilized temperature in the luminaire. LM-82 testing is required, as is either TM-21 or luminaire level testing for lumen maintenance.

Limited Luminaire Testing Required When Using CSD Data

Some additional testing is still required of the luminaire itself, but is significantly reduced when using items listed on the CSD, as data is available and already certified. Additional testing requirements are determined by the type of luminaire being qualified:

Non-Directional Luminaires require less testing when using data from the CSD, as many of the requirements can be met with information from the CSD. The chart on the next page shows which requirements are fulfilled by CSD data. Using CSD data, the only ENERGY STAR testing a luminaire may require could be as simple as in-situ temperature measurement tests on the CSD components and minor electrical testing.

Directional luminaires are required to be tested using luminaire photometry (testing the luminaire as a unit). While limited performance data can be taken directly from the CSD, using CSD listed items can still reduce the testing required of directional luminaires, particularly the lifetime testing, as shown in the second chart on the following page.

Non-Directional Requirement	Lamp	Ballast	Lamp & Ballast Platform	GU24 Based Discharge Lamp	LED Light Engine / GU24 Lamp
Luminous Efficacy	✔		✔	✔	✔
Lumen Output	✔		✔	✔	✔
Light Source Life	✔		✔	✔	✔
Lumen Maintenance	✔		✔	✔	✔
CCT	✔		✔	✔	✔
CRI	✔		✔	✔	✔
Color Maintenance (LED Only)	-	-	-	-	✔
Source Start Time		✔	✔	✔	✔
Source Run-Up Time	✔		✔	✔	✔
Light Source Replaceability	✔		✔	✔	✔
Dimming		✔	✔	✔	✔
Power Factor		✔	✔	✔	✔
Transient Protection		✔	✔	✔	✔
Lamp Current Crest Factor		✔	✔	✔	✔
Off-State Power Consumption					
Operating Frequency		✔	✔	✔	✔
Ballast/Driver Replaceability				✔	✔
Noise		**	**	**	**
EMI / RFI		✔	✔	✔	✔
Maximum Measured Ballast or Driver Case Temperature					
Electronic Ballast or Driver Safety Requirements		✔	✔	✔	✔
In-Situ LED Case TMP Measurement					
Tb Temperature Measurement					

Directional Requirement	Lamp	Ballast	Lamp & Ballast Platform	GU24 Based Discharge Lamp	LED Light Engine / GU24 Lamp
Luminous Efficacy					
Lument Output					
Zonal Lumen Density					
Light Source Life	✔		✔	✔	✔
Lumen Maintenance	✔		✔	✔	✔
CCT	✔		✔	✔	✔
CRI	✔		✔	✔	✔
CAU	-	-	-	-	
Color Maintenance	-	-	-	-	
Source Start Time		✔	✔	✔	✔
Source Run-Up Time	✔		✔	✔	✔
Light Source Replaceability	✔		✔	✔	✔
Dimming		✔	✔	✔	✔
Power Factor		✔	✔	✔	✔
Transient Protection		✔	✔	✔	✔
Lamp Current Crest Factor		✔	✔	✔	✔
Off-State Power Consumption					
Operating Frequency		✔	✔	✔	✔
Ballast/Driver Replaceability				✔	✔
Noise		**	**	**	**
EMI / RFI		✔	✔	✔	✔
Maximum Measured Ballast or Driver Case Temperature					
Electronic Ballast or Driver Safety Requirements		✔	✔	✔	✔
In-Situ LED Case TMP Measurement					
Tb Temperature Measurement					

The CSD is also helpful when adding an additional allowable source or ballast to protect against supply disruptions, or to allow for more flexibility based on customer preference. For non-directional luminaires, select an appropriate source (lamp or light engine) from the CSD and perform an in-situ thermal test (if required). For directional luminaires, simplified photometric testing may be required depending on the nature of the source.

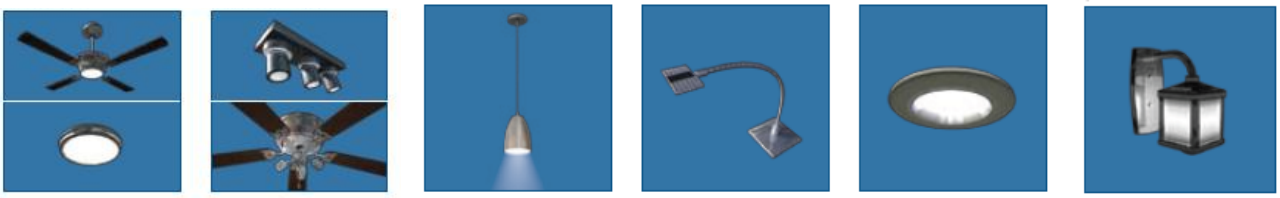
Subcomponents on the CSD ***are not ENERGY STAR qualified*** as a result of being listed.

Subcomponent's with data certified for purposes of the CSD:

- May not carry any of the Program's certification or promotional marks on the products, on product packaging, or in associated literature either printed or electronic.
- May not be referred to as ENERGY STAR qualified, certified, rated, or approved.

GU24-based integrated lamps that are ENERGY STAR qualified may appear on both the CSD and the lamps qualified product list.

Questions about appropriate references to CSD listings in subcomponent marketing materials may be directed to luminaires@energystar.gov. Full performance specification ENERGY STAR luminaires (1.29MB).



Example

To qualify a decorative fluorescent wall sconce, which is classified as a non-directional luminaire, using a 4-pin fluorescent lamp and ballast from the CSD would only require:

ENERGY STAR testing of:

- ✓ Off-state power consumption (if there is an internal method of switching)
- ✓ Ballast case temperature

CB confirmation of:

- ✓ Ballast and Light Source Replaceability
- ✓ Light Source Shipment
- ✓ Safety Listing
- ✓ Labeling & Packaging