

Field-Adjustable Light Distribution Example: Integral FALD Listed in Multiple Primary Use Designations

Introduction

In March 2019, DLC released a policy to address solid-state lighting products with field-adjustable light distribution (FALD). For the details of this policy, please see the details [here](#).

To add clarity to this new policy approach, the DLC has developed a number of illustrative examples to highlight how the policy can be used to qualify products with these field-adjustable features. This example covers a scenario where a manufacturer is seeking to qualify a luminaire that adjusts its distribution via “integral” means, and is applying to be listed on the QPL in **multiple primary use designations (PUDs)**.

The following is provided for illustration purposes only and is not intended to mimic any specific known product or manufacturer.

Product Description

A manufacturer produces and sells a high-bay luminaire. The optical distribution is adjustable via a remote control, which alters the relative current through specific LEDs and their associated optics, which in turn alters the overall beam spread of the luminaire. In this product, there are two beam settings, one appropriate for the High-Bay Aisle primary use designation and the other appropriate for the general High-Bay Luminaire primary use designation. These two beam settings are referred to as “Beam 1” and “Beam 2” where Beam 1 refers to a 50 degree beam and Beam 2 refers to a 120 degree beam in the product literature.

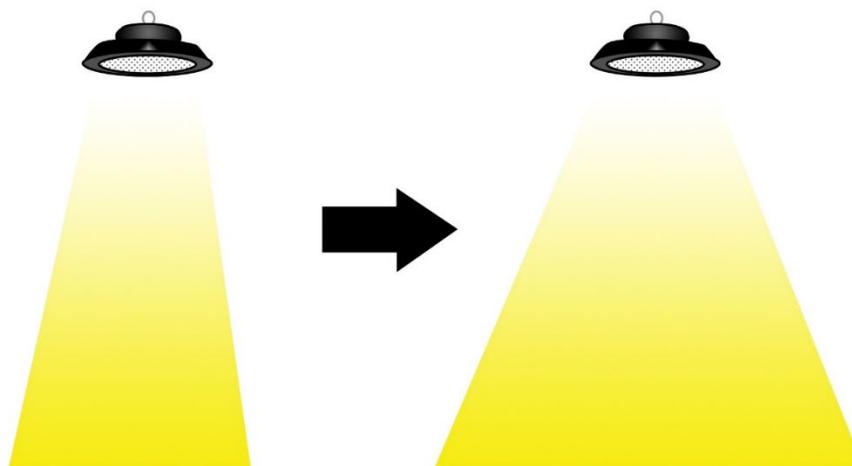


Figure 1: Model ABC-123, with adjustable beam settings

A summary of the product performance is presented in the following table:

Model, Setting	Light Output (lm)	Wattage (W)	Efficacy (lm/W)
ABC-123, Beam 1	12,000	100	120
ABC-123, Beam 2	12,100	100	121

Table 1: Basic summary of performance for product ABC-123, at each beam setting

Scenario Description

Due to the differences in distribution, Beam 1 (the narrower setting) is marketed for aisle applications and Beam 2 (wider setting) is marketed for non-aisle high-bay applications. In this scenario, the manufacturer desires to have the product listed on the QPL in **both the high-bay and high-bay aisle primary use designations (PUDs)**.

Let us assume that Beam 1 is worst case optically and therefore has lower lumens and efficacy, as well as a hotter thermal environment. We will also assume that this product is only offered at one wattage, and at only one color temperature and CRI.

Required Testing

Per the FALD policy, “testing shall be conducted in the light distribution settings that result in the worst-case performance for each of efficacy, wattage, lumen output, power quality, and thermal In-Situ Temperature Measurement Testing (ISTMT).” The manufacturer must conduct:

- An LM-79 for light output, efficacy and wattage conducted on the product in the Beam 1 setting
- An (LED) ISTMT on the product in the Beam 1 setting

Additionally:

- If the LM-79 described above does not include power quality metrics, electrical testing will need to be conducted either via LM-79 methods or via benchtop testing.
- If the LM-79 does not include color metrics, an LM-79 will need to be provided on either beam setting that includes the color metrics.

For proving that the product meets the zonal-lumen distribution (ZLD) requirements, by policy the manufacturer must demonstrate that the product can meet the ZLD requirements of each PUD for which it is applying in at least one setting, via providing an IES file for the product in that setting that shows it passes the ZLD requirements. Additionally, manufacturers must submit a correlation sheet that directly associates products with an IES file corresponding to a distribution that they can achieve.

- In this scenario, the manufacturer should provide an IES file for both Beam 1 and Beam 2
- Note that if one beam setting (for example, Beam 1) passed the requirements for both PUDs (for example, Beam 1 passed the high-bay luminaire ZLD, as well as the high-bay aisle PUD) than an IES file describing the Beam 1 distribution would be sufficient to qualify the product, and a Beam 2 IES file would not be strictly required. Please note, however, that the “Adjustable Distribution Setting” field on the application form must match

whichever configuration for which the IES file is provided, and generally both IES files would be expected.

Finally, please see the sample application form for this scenario [here](#). Please note the following:

- The product model number, applying for two listings
- As the reported performance rules state that the product performance in the “reported” field must match the tested orientation, the “reported” performance data for product listing is the performance in the Beam 1 setting. This is despite the likely use case that in non-aisle High-Bay end-use applications, the product would be likely to be used in the Beam 2 setting, and therefore the expected performance would be different.
- If the product is dimmable, default light output and default wattage performance fields have flexibility to allow the manufacturer to use as they would like. In the example, they reflect the performance of the product in the two beam settings.
- The “Adjustable Distribution Setting” field indicates the setting under which the product meets the ZLD requirements of the PUD that line corresponds with. In this case, the high-bay aisle PUD would be expected to list “Beam 1.” The non-aisle high-bay luminaire PUD would be expected to list “Beam 2”, but may list “Beam 1” if that is the IES file provided, and Beam 1 meets the non-aisle ZLD requirement. These values must match the IES files provided. Here, it is anticipated that in such a scenario the manufacturer would prefer to list the more specific setting to the PUD.

What will the Application Fees Be?

Per policy, FALD products must submit as family grouping applications. The family grouping application fee scheduled is based on the number of LM-79s and ISTMTs needed to assess the product (“independent test reports” or “ITR”), as well as the number of additional family members and dimming variations.

In this application, there is one product, requiring 2 ITRs (one complete LM-79 and one ISTMT), with no additional family members. Therefore the fee for this application would be \$1000.

How will the Product End Up Getting Listed?

This application results in two listings: one product, with test data, appearing with listings confirming that it is qualified in the “High Bay Luminaires for Commercial and Industrial Buildings” PUD, and another, with test data, in the “High Bay Aisle Luminaires for Commercial and Industrial Buildings” PUD.

- Both listings would have the same test data, as well as the same basic reported performance data. This would be the performance of the product when installed with lens B, as that is the worst-case configuration.
- The listing in high-bay aisle PUD would indicate that the “Adjustable Distribution Setting” for which the product meets the ZLD for the non-cutoff PUD is “Beam 1”.
- The listing in the non-aisle high-bay PUD would indicate that the “Adjustable Distribution Setting” for which the product meets the ZLD for the non-cutoff PUD is “Beam 2”.