

Field-Adjustable Light Distribution Example: Integral FALD Listed in 1 Primary Use Designation and General Application

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 **only one primary use designation (PUD)**.

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.

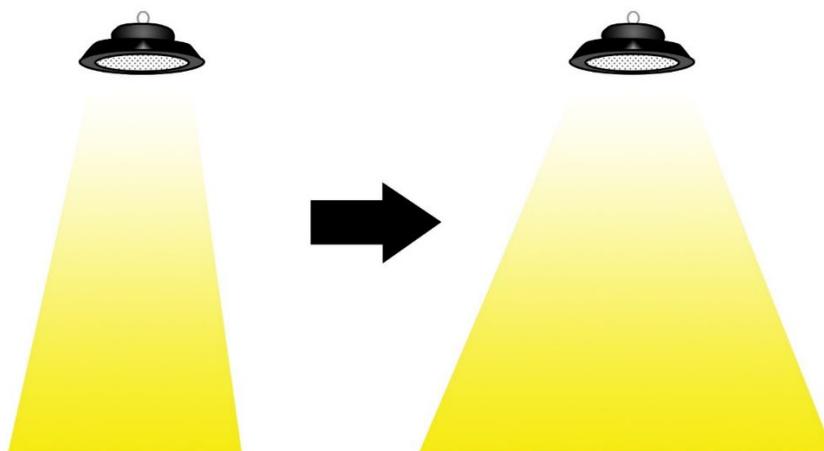


Figure 1: Model ABC-123, with adjustable beam settings

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-High Output	12,000	100	120
ABC-123, Beam 2-High Output	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 only the high-bay luminaire primary use designation (PUD).

Let us assume that Beam 1 (the narrower, 50° beam) is worst-case in most metrics, and therefore has lower lumen output and efficacy, as well as a hotter thermal environment for the hottest LEDs. We will also assume that this product is only offered at one wattage, and at only one CCT 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).” As all of these metrics are worst-case on ABC-at the Beam 1 setting, 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

Emphasis is added here to note that the testing must be conducted in the Beam 1 setting, despite the fact that the product is *not* applying for listing on the QPL in the PUD intended for Beam 1, because the product is worst-case when at the Beam 1 setting, and testing must be in the worst-case configuration.

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, since the manufacturer is only submitting the product in the high-bay luminaire primary use, an IES file for the Beam 2 setting should be provided.
- Note that if the Beam 1 setting passed the requirements for high-bay luminaire ZLD, than an IES file describing the Beam 1 distribution would also be acceptable. Please note, however, that the “Adjustable Distribution Setting” field on the application form must match whichever configuration for which the IES file is provided.

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

- The product model number, applying for one listing
- 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 the High-Bay Luminaire PUD, the product would be likely to be used in the Beam 2 setting.
- 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 Beam 2 setting.
- 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 field may list either Beam 1 or Beam 2, so long as the listed setting passes the ZLD requirements, and must correspond to the provided IES file, as noted above. This application form assumes providing the IES file for Beam 2.

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 ITR’s (one complete LM-79, and one ISTMT), with no additional family members. Therefore the application fee for this application would be \$1000.

How will the Product End Up Getting Listed?

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

- Both the test data and the basic “reported” performance data would be for the performance of the product at the Beam 1 setting, as that is the worst-case configuration. This is true even though it is applied in a PUD more likely to be used at the Beam 2 setting.

- The listing would indicate that the “Adjustable Distribution Setting” for which the product meets the ZLD for the high-bay luminaire PUD, corresponding to the provided IES file. In this case, it is assumed the manufacturer provided the IES file for Beam 2, and therefore that would be listed.