

# TLEDs

## Tubular LED or Linear Fluorescent Replacement

Many TLED options are available for your lighting retrofit. Each option has its own features, which may or may not meet your lighting needs. All TLEDs use lamp holders. We recommend performing a mock-up in a small space to determine if TLED is right for you, and to ensure you select the right TLED before purchasing a large quantity. The DesignLights Consortium (DLC) considers all TLEDs a linear replacement lamp. Four styles of TLEDs are available:

- 1. UL Type A:** These TLEDs are direct replacements for existing fluorescent lamps and use lamp holders to connect to the fixture being retrofitted. Type A TLEDs operate off the existing electronic instant start ballast, if it is compatible with the TLED. The lumen output and wattage consumed may vary depending on the existing ballast type. This option does not require installation by a licensed electrical contractor (unless replacing the electronic ballast).
- 2. UL Type B:** These TLEDs use lamp holders to connect to the fixture being retrofitted and do not operate off the existing fluorescent ballast. Type B TLEDs use an internal driver within the TLED. They obtain power from one or both ends of the lamp. To install, disconnect and fully remove the existing fluorescent ballast(s). Rewiring of the fixture is required, and line voltage is sent directly to the lamp holders. This option requires installation by a licensed electrical contractor.
- 3. UL Type C:** These TLEDs use lamp holders to connect to the fixture being retrofitted. They do not operate off the existing fluorescent ballast. Type C TLEDs require disconnection and full removal of the ballast. Rewiring of the fixture to replace the ballast with an external driver is required. The lamp holders are wired to receive low-voltage electricity from the external driver. This option requires installation by a licensed electrical contractor.
- 4. Dual Mode (DM) Internal Driver (UL Type A and Type B):** DM TLEDs can operate off the existing electronic ballast or be rewired to operate off line voltage (UL Type A and Type B). The same requirements under UL Type A and Type B apply.

## Requirements for Incentives

- All TLEDs must be on one of the following Qualified Product Lists (QPL): DLC, LDL or ENERGY STAR® (exception: sign lighting).
- Installation of new lamp holders is highly recommended. Lamp holders must be in good condition to support the TLED and meet LED manufacturer specifications. Broken, cracked or arc-damaged lamp holders must be replaced to receive an incentive.
- TLEDs in refrigeration case lighting must be listed under the Display Case Lighting category on the QPL.
- A mock-up for customer observation and approval is highly recommended before proceeding with a full retrofit.
- UL Type A retrofits: The electronic ballast must be compatible with the TLED (reference manufacturer compatibility listing). Magnetic ballasts are ineligible. Installation of new lamp holders is highly recommended. Lamp holders must be in good condition to support the TLED and meet LED manufacturer specifications. Broken, cracked or arc-damaged lamp holders must be replaced to receive an incentive. If replacing the electronic ballast, work must be performed by a licensed electrical contractor.

- UL Type B retrofits: Must use a licensed electrical contractor. Must remove the existing fluorescent ballast. Lamps must be clearly labeled with LED manufacturer-provided labels to inform maintenance workers these are LED UL Type B lamps. Installation of new lamp holders is highly recommended. Lamp holders must be in good condition to support the TLED and meet LED manufacturer specifications. Broken, cracked or arc-damaged lamp holders must be replaced to receive an incentive.
- UL Type C retrofits: Must use a licensed electrical contractor. Must remove the existing fluorescent ballast. Lamps must be labeled with LED manufacturer-provided labels to inform maintenance workers these are LED UL Type C lamps. Installation of new lamp holders is highly recommended. Lamp holders must be in good condition to support the TLED and meet LED manufacturer specifications. Broken, cracked or arc-damaged lamp holders must be replaced to receive an incentive.
- DM Internal Driver (UL Type A and Type B): See requirements for UL Type A and B retrofits.

### **Link to LED QPL Lists**

[lightingdesignlab.com/LED-List](http://lightingdesignlab.com/LED-List)

### **Additional Information & Resources**

[designlights.org/content/QPL/ProductSubmit/LinearReplacementLamps#PrimaryUseDesignations](http://designlights.org/content/QPL/ProductSubmit/LinearReplacementLamps#PrimaryUseDesignations)

[energy.gov/sites/prod/files/2016/04/f30/mccullough\\_tleds\\_lightfair2016.pdf](http://energy.gov/sites/prod/files/2016/04/f30/mccullough_tleds_lightfair2016.pdf)