

## FAQ regarding LED Tubes

### What are LED tubes?

LED tubes look like linear four or two foot fluorescent tubes, but contain multiple LEDs that generate light.

### How are LED tubes used?

LED tubes are used to replace fluorescent tubes in order to save energy, reduce maintenance costs, and provide a better quality of light.

### What are the different types of LED tubes?

There are several types of LED tubes

1. Direct Wiring - The first type is contained in a simple retrofit kit that includes the tube, installation instructions, and labels. This type of tube bypasses the existing fluorescent ballast and uses mains voltage wired to the lamp holder. Since the fluorescent ballast is bypassed, the total energy consumed is that of the LED tube.
2. Ballast Compatible - The second type is a replacement for the fluorescent tube and is powered by the fluorescent ballast. Since the fluorescent ballast is still operating, the total energy consumed is the sum of that consumed by the fluorescent ballast and that consumed by the LED tube. When the fluorescent ballast fails, it normally needs to be replaced or the lighting system will not work.

About 80% of the installed fluorescent ballasts are instant start, and have a high open circuit voltage of about 600 volts that is applied to start the fluorescent tube. This high voltage can cause electrical stress on the LED tube and can result in shortened tube life.

### Doesn't rewiring void the UL listing of the luminaire?

No, rewiring the luminaire does not void the UL listing of the luminaire.

UL 1598C Section 15.1 states "Installation of the retrofit kit on the intended luminaire when conducted in accordance with the installation instructions provided with the retrofit kit and using components and materials provided with the kit shall facilitate continued compliance of the retrofitted luminaire with the requirements in the Standard for Luminaires, UL 1598."

This means that as long the Forest Lighting installation instructions for the retrofit kit are followed, the retrofitted luminaire shall comply with the requirements in the UL Standard

for Luminaires, UL 1598. Of course, the installation should be done by a qualified electrician. All Forest Lighting products comply with the applicable UL safety standard.

### **What are color temperatures?**

Color temperature is a method of describing the color characteristics of light, usually either warm (yellowish) or cool (bluish), and measured in degrees Kelvin (°K). An incandescent lamp has a color temperature of 2700K and the sun has a color temperature of 6000K-10000K.

### **Are LED Tubes dimmable?**

Type 1 tubes are not dimmable.

Type 2 tubes are only dimmable if the existing fluorescent ballast is a dimming ballast.

### **How long do LED Tubes last?**

Depending on the design and the components used, the LED tubes will last from 20,000-50,000 hours.

### **Do LED tubes emit UV?**

All LED tubes used for general lighting applications emit a very small amount of UV, so small that LEDs are now used for museum lighting

### **Do LED tubes contain any Mercury?**

No, LED tubes do not contain any Mercury.

### **How do I dispose of LED Tubes?**

Since LED tubes do not contain any hazardous substances, they should be disposed of in accordance with federal, state, and local requirements.

### **What safety standards apply to LED tubes?**

LED tubes of type 1 are addressed by UL 1598C, Standard for Safety Light- Emitting Diode (LED) Retrofit Luminaire Conversion Kits LED tubes of type 2 are addressed by UL 1993, Standard for Safety Self-Ballasted Lamps and Lamp Adapters.

### **What is the Design Lights Consortium (DLC)?**

The DLC is a project of Northeast Energy Efficiency Partnerships (NEEP), a regional non-profit organization that promotes quality, performance and energy efficient commercial sector lighting solutions through collaboration among its federal, regional, state, utility, and energy efficiency program members, luminaire manufacturers, lighting designers, and other industry stakeholders throughout the US and Canada.

The DLC serves efficiency programs by maintaining the leading public list of high quality, high efficiency LED products for the commercial sector called the DLC “Qualified



Products List” (QPL). Efficiency programs use the QPL as a basis for establishing rebate or incentive programs.

**How do Forest Lighting LED Tubes differ from those offered by other manufacturers?**

Forest Lighting LED tubes are UL and DLC listed. We offer direct-wiring version (Type 1 described above) available in 3000K, 4100K, 5000K and 6000K. Our products are highly affordable, but unlike other providers, offer superior technical performance characteristics and have a life time rating of 50,000 hours and a 5-year warranty backed by one of the world’s largest manufacturers of LEDs.