

Dual Mode LED Retrofit Tubes Raise Safety Concerns

James Industries' Dual-Mode LED "Magic Tubes" poses fire hazard; involved in several recent fires

FAQ's

Introduction: "Dual Mode" T-8 LED retrofit tubes have been increasing in popularity in the LED lighting marketplace. They are typically sold as a "one-size-fits-all" solution, making it difficult to sell against if you are offering a "Single Mode" product.

The typical sales pitch for the Dual-Mode tube is that there is no need for a ballast bypass when installing. All it takes is an easy direct retrofit into an existing 4-ft Fluorescent T8 fixture with an electronic ballast, and it's ready to go. And later, once the ballast goes out, you can bypass the ballast and direct wire. There will be no need to purchase new ballasts. This might sound compelling, especially on a large volume project.

However, the Dual Mode products often pose safety hazards that are not well known in the marketplace but, if known, would likely be a very significant factor in the buying decision.

The purpose of these FAQ's is to alert MaxLite personnel to, and to provide detail concerning, these issues.

If there are any questions, please contact Greg Galluccio, VP, Product Management & Engineering, or Zvi Raskin, General Counsel.

1. What are Type "A," Type "B," Type "C" and "Dual Mode" tubes?

Type A	Ballast compatible	A ballast-compatible T8 LED lamp is intended to be installed directly into a ballasted T8 Fluorescent fixture. It is designed to work off the existing fluorescent ballast and requires no modification to the fixture.
Type B	Ballast bypass	A ballast-bypass T8 LED lamp is designed to work on branch circuit voltages and is not compatible with the installed fluorescent ballast in a T8 fluorescent fixture. Installation must be done by a certified electrician and requires the removal of the fluorescent ballast from the circuit and line voltage to be routed directly to the lampholders. (A Type B product may be installed with line and neutral running to each of the two pins on one side of the fixture (single-ended), or it may be installed with line voltage running to one side and neutral run to the other side (double-ended).)
Type C	Remote driver	A remote driver T8 LED tube uses an external LED driver to drive one or more LED lamps in the fixture. Installation requires the existing fluorescent ballast to be removed and replaced with an LED driver. The output of the LED driver is then led to the lampholders

		to power the lamps.
Dual Mode (or “Hybrid”):	Combines Type A & B	LED retrofit tubes that are designed as “dual mode” (sometimes called “hybrid”) combine a Type “A” (ballast connected) mode and a Type “B” (ballast bypass) mode in a single tube. They can be installed as either Type A or Type B; they will function if installed on an existing fluorescent ballast, and will also function if connected directly to the branch circuit. (Some dual-mode lamps can also be installed in either a single-ended or double-ended configuration.)

2. What are examples of the dual-mode LED retrofit tubes that are currently being sold?

- James Industries’ “Magic Tube”
(Note that James Industries has gone through several name changes and manufactures and sells LED tubes under various names. Names associated with James Industries include Dongguan Pan American Electronic Co., Ltd, James Industry Group Co., Ltd., James Trading Company Ltd., Axis Led Group and A Electronics Co Ltd.)
- Aledra’s “SureFit”
- EiKO’s “LED T8 Dual Mode Replacement Lamp”
- Ledtronics’ “LED T8 Ballast-Ready/Dual Mode Tube Lights”
- ABB Lighting’s (Above All Others) “Dual Model Technology LED T8 Glass Tube”
- Super Lighting’s “Dual Mode” retrofit LED T8 tube lamp
- Retrofit Lighting’s “ T8 dual mode LED tubes”
- HyLite’s (a division of ARVA) “Dual-Mode Deluxe Tube”
- Emium Lighting’s “dual mode LED T8’s”
- Louvers’ “All Purpose T8 LED Replacement Tube”
- Norman Lamps’ “Hybrid” LED T8 Tubes”
- Costless Lighting’s “Dual Mode Hybrid LED”

3. What are the dangers posed by dual-mode LED tubes?

When a dual-mode lamp is installed, it will either be connected to an existing ballast or directly to the branch circuit. Either way, the dual-mode lamp creates a dangerous situation:

At the point of sale, a dual mode lamp (just like a Type A lamp) is not required to have any of the warning labels mandated under UL1598C for ballast bypass installations.

Therefore, if the dual-mode product is connected directly to the branch circuit (i.e., a ballast-bypass installation), the person wiring the fixture will not have access to the appropriate warning labels to affix to the fixture as required under UL1598C, resulting in a non-compliant and dangerous installation. Crucial safety information (such as the appropriate replacement lamp type) will be missing and, in addition, the UL listing on the fixture is voided (something that the dual-mode-lamp seller will never tell its customer), and

If the dual-mode product is connected to a ballast, then when the ballast eventually fails (and it will!) and the dual-mode fixture is being rewired, the person removing the ballast and re-wiring

the fixture will not have access to the appropriate warning labels to affix to the fixture as required under UL1598C, resulting, as described in the preceding paragraph, in a non-compliant installation.

Of further concern in the case of nearly all dual-mode products is that a potential shock hazard is presented if one end of the dual mode tube is installed into a live lampholder while the pins on the other end are exposed to contact by the installer. The danger is magnified when taking into account the reaction hazard present if the installer is standing on a ladder or scaffold at the time of installation. (Certain manufacturers, such as Aledra, claim that their “Surefit” dual-mode tube do not present this shock hazard.)

In short, the use of dual-mode tubes results in:

- **The routine mislabeling of lamps**
- **The lack of necessary warning markings**
- **Additional risk of fire**
- **Additional risk of shock hazard**
- **Voiding of the fixture’s UL Listing.**

To mitigate the risk that they present, it is necessary that precautions be taken to restrict the use and operation of dual-mode tubes.

4. Have there been any reported fires involving these dual-mode LED tubes?

Yes, there have been reports of several fires involving dual-mode LED retrofit T-8 tubes, which are currently under investigation. **We are aware of at least 2 fires or smoking conditions involving James Industries’ dual-mode “Magic Tube” product.**

5. Are Type A and Type B LED retrofit tubes eligible for UL Listing?

While Type A tubes are eligible to be UL *Listed* under the UL 1993 standard, the potential dangers presented by Type B make it ineligible for UL Listing; instead, a Type B tube can only be UL *Classified* under the UL 1598C standard.

As a result, unlike Type A, Type B tubes are subject to the requirements that installations be accompanied by specific instructions, and that specified warning labels be included with the lamps and applied to the fixture at the time of installation.

6. What about dual mode tubes – can they be UL Listed?

There is no UL standard that specifically covers these new dual-mode tubes. However, to the extent that they can act as Type B tubes, they present the same potential safety hazards as a Type B tube even when misleadingly presented to the UL and/or sold as a Type A tube, and should be subject to the UL instruction and warning requirements that apply to Type B tubes.

Indeed, in recognition of the potential safety risks posed by dual mode LED tube products, UL is now considering new marking requirements to be added to UL 1993 concerning the labeling of dual-mode products. The new UL requirements would mandate that dual mode tubes comply with the Type B labeling requirements and, additionally, be labeled as both Type A and Type B.

But until this happens, it's important to get the message out to the marketplace – dual mode is not safe and will routinely be used in a way that voids its UL listing.

7. Why isn't there greater public awareness of the potential safety hazards posed by dual-mode LED retrofit tubes?

The fact is that the awareness is growing. Notably, a White Paper is being prepared by members of NEMA (the National Electrical Manufacturer Association) to highlight these safety concerns and to alert constituents to the inaccurate labeling and marking typically found on dual-mode tubes. The White Paper is expected to be issued this spring.

It is expected that NEMA will recommend that utilities and end users work closely with their T8 LED tube suppliers to determine whether or not a particular T8 LED tube is actually a dual mode tube and take the necessary precautions to restrict the use and operation of dual-mode tubes to avoid any additional risk of fire or shock hazard in the field.