



# WHY WE DON'T RECOMMEND LED TUBES



It is however, important to know that **BrightVest Africa** does manufacture LED tubes and will provide them if necessary. In fact, **BrightVest Africa** makes the best LED tubes in the market. They range from 9w to 30W and reach up to 170 Lm/W (delivered). The optical housing is made of nano-plastic which is a new material that is stronger, lighter weight, diffuses the light more evenly, delivers better thermal properties and encounters less optical loss as the light passes through it. The tubes have open circuit protection, short circuit protection, and over voltage protection. In short, these are the best tubes in the market. That said, we still do not recommend them (for reasons listed below) unless absolutely necessary.

## 5 Reasons Why we don't recommend LED tubes:

### 1. LED Tubes Are Available in Three Main Variations:

#### i. High voltage – runs off your mains – AC.

In this scenario, an electrician bypasses the existing fluorescent ballast and powers the LED tubes directly off of the main AC voltage. When power is delivered on-board of the LED engine (LED tube), the ability to provision for power fluctuations is drastically reduced. In fact, most LED tubes have little to no electrical protection, making them very vulnerable to dirty, inconsistent and fluctuating power conditions. This, in turn, can cause flickering, failure and more rapid light decay.

## ii. Low voltage – no driver

In this scenario, LED tubes are powered by the existing fluorescent fixture ballast. You power the new LED tube off of an old fluorescent ballast. The old ballast will be less efficient and will contribute to additional and unnecessary power consumption. The old ballast is likely to fail before the LED tube, resulting in unplanned near-term maintenance. There will also be unpredictability as to how long the LED tubes will operate because it is now dependent on the old, less reliable and less efficient ballast.

## iii. Low voltage – with driver

In this scenario, the existing fluorescent ballast is replaced with a new driver which powers the LED tube. This approach requires more labour to install (remove old ballast, replace with new one and in some cases rewire to the electrodes). The main attraction of an LED tube approach, is simplicity and perceived cost. Once you have gone this route, your associated labour is almost the same as simply replacing the entire fixture. However, by replacing the entire fixture, you gain a lot of extra benefit (explained below).

**Note:** Depending on the variation, there is also a risk of mismatch. For example, if the existing fixtures have been rewired to accept high voltage AC powered LED tubes and some unknowing maintenance person attempts to replace a defective LED tube with a fluorescent tube, a safety hazard will occur, which can lead to serious injury.

## 2. Reliability and Uncertainty:

The lumen depreciation and life-cycle of a light fixture or lamp is determined by performing TM-21 calculations. In order to perform TM-21 calculations we need to know the ISTMT of the fixture, we need LM-80 data, we need to know the drive current of the fixture and we need to know the high end, average ambient temperature of the environment where the fixture will operate. 3 of these 4 requirements are obtained by sending a complete fixture or lamp to an accredited test lab, where the data is determined and recorded. In the case of a complete fixture (inclusive of driver, LED engine, fixture, lenses, etc.), these recorded values remain constant regardless of the environment they are installed in. Remember ISTMT tests raise the ambient temperature to a set value (typically 25C) when the test is being performed. This means a complete fixture running in an environment that is  $\leq$  the ambient temperature associated with the ISTMT test, has accurate predictability of performance, light-loss and lifecycle.

Now take an LED tube—the moment that tube is installed into an unknown existing fixture, the thermal properties will change significantly. Even worse, if you install a LED tube into an enclosed fixture the thermals will change even more substantially. When this happens, there is no way to determine how the LED tube will perform. You don't know how rapidly it will decay, you don't know if it will exceed its thermal thresholds and you don't know how long the LED tube will last. So, if you install an LED tube into an existing fluorescent fixture, you're simply guessing as to how long and how well it will perform. Since the goal of LED fixtures is to provide reliable, long lasting, efficient performance, it is important to look at the fixture as a whole. This also includes mechanical/physical aspects, as this has a direct impact on thermals, which has a direct impact on performance and reliability.





### **3. Reduced Light Output and Predictability:**

Existing fixtures come in all shapes and sizes. Some have reflector baffles, some are deep, some are shallow, some are sealed, etc. The whole point is, depending on the unique attributes of the existing fixture, an LED tube will deliver light very differently from one fixture to another. When using LED tubes, it is very common to experience trapped light (light that never makes it out of the fixture). When installing LED tubes into an existing fixture you have no idea how the light will actually perform and in most cases you are wasting light (and therefore energy) because you are unable to predict or control its distribution. A new fixture will have defined and finite performance values. By combining photometric design, we know exactly how a given fixture will perform in a given environment. We can then select the most beneficial fixture for that environment. Using an LED tube is a guess as it pertains to performance and it will assuredly leave a lot of unrealized efficiency and reliability on the table.

### **4. Reduced Aesthetics:**

Lighting and the aesthetics of lighting has a dramatic effect on the look and feel of an environment. These days, people understand that the look and feel of an environment affects morale, efficiency, productivity, health, amongst many other things. There is a massive opportunity to address these ergonomic issues when replacing light fixtures. It is very common that existing fluorescent fixtures are dated, tarnished, yellowing, broken, etc. Replacing these fixtures with newer, sleeker more contemporary looking fixtures not only improves efficiency and reliability, it provides the environment with a much-needed face-lift. LED tubes cannot address this issue.

### **5. Less Control Flexibility:**

Complete fixtures simply have more possibilities when it comes to built-in-control and automation. It's not to say you can't control LED tubes, but you can't do as much. For example, some people want to be able to tune (change) their CCT (Correlated Colour Temperature) based on their varying daily preferences. Also dim to warm is a sought-after feature. Although these features are basic, you cannot effectively do this (and others) with LED tubes. Plus, you can't dim as smoothly and you can't dim as low (i.e. dim to 2%) with tubes.