

## Tough SmartMarquee Maintains Uniform Brightness Over Life! HOW?

The luminous intensity of an LED depends upon the current going through it. It is also a known fact that the luminous intensity degrades over a period of time. If the current flowing through each one of the 3840 LEDs in the competitor's marquee shown to the right varies even as much as 10% and the luminous intensity differs even as much as 20%, the result would be a sign that will look great when first installed but would need replacement within a few years because some of the LEDs would be dimmer than others or simply burnt out.

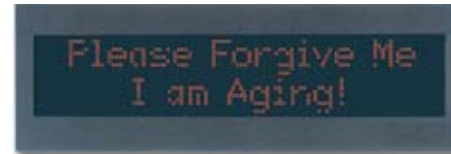
In order to avoid this dilemma and have the marquee look as good as when first installed, Tough SmartMarquees accomplish this by:

1. Using Matched Luminous Intensity LEDs
2. Carefully controlling the current through each LED
3. Reduce switching current losses to almost nothing
4. Use very efficient, 95% plus, switching power supplies
5. Perform a 96-hour burn-in test under power to weed out marginal LEDs

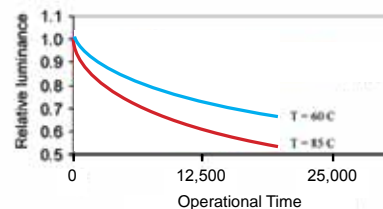
*Uticor after 10 Years*



*Competitor's Marquee after 10 Years*



*LED Luminous Intensity Aging Curve*



## Energy Efficient, 1/3<sup>rd</sup> of the Power Consumption

When designing a marquee, one of the biggest challenges is to manage the power. Even though each LED may need only 10 mA of steady state current or 80-100 mA of peak current, the number of LEDs in even a small marquee is quite large.

For example, a 2 line 20 character tri-color sign has 1920 Red and 1920 Green LEDs and could theoretically draw a steady state current of 3840 x 10 mA or 38 amps, even though not all LEDs will be "on" at the same time. However, you can expect a current of 25 amps.

Most competitive marquees use rather inefficient power supplies and would thus use approximately 200 watts. That is a lot of power which results in a significant increase in internal temperature causing them to design **Thermal Overloads** or sometimes even **Fans** to keep the marquee cool. AB's Inview or Adaptive marquees for example are rated at 55° C but have an automatic **dimdown** at 55° C and an automatic shutdown at 70° C.

**Not so with Uticor Tough SmartMarquee!** With AVG's innovation and vertical integration strength, we have designed the Tough SmartMarquee to consume 1/3rd of typical power and have used a very efficient power switching system (Patent Pending) without sacrificing the LED luminous intensity. This innovative and efficient design automatically results in reducing the weight of Tough SmartMarquee.

**RESULT:**  
NO OVER HEATING  
NO THERMAL SHUTDOWN  
Full operation up to 60° C Ambient!

