



## LED TRAFFIC SIGNAL DISPLAYS

### Introduction

As of June 27th, 2005 new performance specifications for LED signals are available from the Institute of Traffic Engineers (ITE). The specifications titled "*Vehicle Traffic Control Signal Heads - Light Emitting Diode (LED) Circular Signal Supplement*" define minimum luminous intensity, uniformity, distribution and chromaticity requirements for 200mm and 300mm diameter ball type red, yellow and green LED signal displays. New specifications for arrow and pedestrian displays will follow. The new ITE specification also defines a much wider range of candlepower intensity which is aimed at improving visibility from wider viewing angles.

### LED Performance

Those who use LED signal displays should be aware that LED's operate quite differently than incandescent lamps. An incandescent lamp will maintain a fairly constant output throughout its rated life. The rated life is typically one year and the standard is to group re-lamp incandescent signals at the end of each year. Light output therefore was not typically an issue with incandescent signal displays. Unlike incandescent lamp, the luminous intensity of an LED will typically depreciate to well below its recommended luminous intensity, as defined in Section 4 of ITES document, before they fail. LED suppliers test their products when produced to ensure conformance to published specifications and these test results can be obtained from the suppliers.

The depreciation of an LED signal display varies depending on the manufacturer, its operating environment and the color of the display. It is therefore difficult for an owner to pin down when the LED will need to be replaced. Unfortunately, at present, there are no procedures for measuring the luminous intensity of any type of traffic signal display in the field with an acceptable level of accuracy.

### Independent Testing

To verify minimum performance the signals should be tested by an independent testing agency. We recommend owners undertake random testing of their LED displays to verify minimum performance requirements are being met.

Many owners who have installed LED signal displays have continued to follow a cleaning cycle based on the yearly cleaning and re-lamping cycle for incandescent lamps. To determine the impacts of dirt on the display we recommend signals be removed and left dirty (maybe half a dozen displays) and sent to a testing lab. The signal would be tested as is (dirty) then wiped clean and retested. From the variation in light output a dirt depreciation percentage could be established. We suspect that when first installed (and intensity is highest) cleaning of an LED display may be undertaken less frequently than once a year and then more frequent over time as the light output depreciates. This will of course depend on the area and the accumulation of dirt on the display.



### Conclusion

In summary we encourage owners who utilize LED signals to develop a program where signals are removed and tested on a regular basis to ensure ITE intensity and chromaticity specifications are maintained. We recommend testing be undertaken at 3 to 5 years from installation with ongoing testing on a regular basis. A list of laboratories who are equipped to test LED's can be obtained from LED suppliers.