LED systems used on entertainment sets

This bulletin is intended to provide appropriate direction to installers, given the influx of LED systems being used and constructed on entertainment sets.

Electrical inspectors have identified several issues and this bulletin should assist in identifying and avoiding hazards if these systems are not properly installed with regard to requirements of the Canadian Electrical Code (CE Code Part 1) or the respective Provincial Electrical Code, and the manufacturer's specifications.

Major issues identified during the electrical inspection process:

- Unapproved components
- Component approval only, ***with no further inspection and approval of the completed system***
- Overloading of conductors
- Inappropriate usage of the product(s) as per manufacturer's specifications

Unapproved components:

As with any electrical product for use in Canada, all products used must be approved for Canadian use and be identified with the recognized testing laboratory logo or field evaluation labels.

Please refer to the following **Recognized Certification Marks:**



Component approval:

Most LED drivers, controllers etc., have only a component approval marking.

This means that although the driver or controller is a recognized (approved) component, once incorporated within a new product or system, the newly finished product requires an additional inspection and approval. Additionally, all set wiring etc. must be constructed according to the respective electrical code and manufacturer's specifications, and then inspected and accepted.

Component Certification Markings: ***Not final product approval marks***



Overloading of conductors: The power supplies, controllers etc. carry a maximum output rating; for example, 8 amps or 16 amps. The load(s) or LED ribbon(s) connected to these supplies must be less than the maximum current rating of the power supply and controller. Any conductors used must be rated for the ampacity of the power supply.

For installation of correctly sized and appropriately protected equipment wire, see table 12 and reference notes of the CEC. Note the derating requirements specified for multiconductor cable or multiple conductors in raceway. Conductors must also be sized correctly to allow for voltage drop, based on the length of the run (Note that: *Run = distance to connection point and back*). DC Voltage drop should be limited to a maximum of 5%. Here is a link to calculate the DC voltage drop in the system: https://www.calculator.net/voltage-drop-calculator

For example, a system running at 12VDC, drawing 5 amps, with a conductor size of 18 gauge and a running length of 100 feet would have a voltage drop of 6.4%, so the conductor size would have to be increased to 16 gauge to reduce the voltage drop to 4%.

When the (positive) return conductor on either single or multi-channel LED ribbons is used as a common return, it must have an ampacity equal to the total current of the single or multiple channels.

Follow manufacturer's specifications:

Adhere to ALL manufacturers instructions and specifications for all the components of the system, covering everything from the rated ampacity of the components, to the correct installation of LED ribbon for heat dissipation purposes.