White paper - Vibration Resistant LED Lights

This white paper discusses how the vibration resistant characteristics of LED lights can help you reduce maintenance costs.

Vibrations and Light Failure

All existing lighting technologies except LEDs use an electrical filament. The filament, clearly seen in an incandescent bulb is made of a thin strip of metal. Shake it too vigorously and the filament will snap resulting in light failure. This is a serious problem in

a) Illuminating areas exposed to vibrations – e.g. bridges, boats, offshore oil rigs
b) Areas prone to vandalism – e.g., public parks
c) Risk of lamp breakage due to the nature of activities – e.g. sports facilities
d) Transportation – e.g. aircrafts, automobiles, trains etc.
e) Lighting on/ near industrial equipment – e.g. reactors, generators etc.
f) Elevators and escalators
g) Ceiling fan lights

The glass envelope problem

Besides the fragile filament, most lighting technologies are encased in a glass or quartz envelop. The brittle nature of this envelope translates to breakage during storage, transport, handling and installation. Besides the cost of broken lights the risk of injury is an important concern associated with traditional light sources.

A combination of fragile filaments, short operational life, high temperature operation and fragile envelopes translates to high maintenance and replacement costs. A study of the light bulb replacement in mines demonstrated that using LED luminaries could significantly cut down the risk of injury to workers besides lowering maintenance costs and loss of working time.

The LED solution

LED lighting products are made of light emitting diodes mounted on circuit boards and connected using soldered leads. The rigidly supported light emitting components are further
enclosed in a resin substance. This is why they are called “solid State Lights” and can withstand extreme vibrations when in use unlike incandescent, fluorescent or other filament based lights.

These robust lights provide additional value in areas where there is risk of injury to the occupants as is the case in children’s rooms, classrooms, food preparation industries and old age homes. The risk of injury from LED lights is minimum and the chances of failure due to vibrations or shocks are no more than those of other solid state devices like mobile phones.

These properties make LED lights ideally suited for both – general purpose and special lighting needs.

**Case studies**

1) **Coolidge Park**

Chattanooga city officials realized the need for better lighting in Coolidge Park when shots were fired in the park when there were close to 300 people around. A similar incident had occurred a year back. While measures like restricting access to the park to people during certain hours was possible good, reliable lighting was considered necessary to ensure better visibility and law enforcement to deter vandals and mischief makers. The LED lights selected for installation use 50 % of the electricity than regular lights would,
can be radio controlled, will last 50,000 hours – 100,000 hours and will significantly improve safety for users of the facility.

2) Charles Berry Bascule Bridge in Lorain

The bridge carries almost 16,000 vehicles per day. It is designed to open on demand to allow commercial vessels plying on the Black river to pass. The bridge is opened 1000 – 2500 times every year to allow boats to pass. Opening up to 100 times in a day exposes the lighting fixtures on the bridge to additional stress forces and traditional lights need frequent replacement adding to the cost and hassles of operating this important public service.

LED floodlights are the ideal choice to illuminate the bridge without adding to the glare, for accent lighting of the pier and tower buildings.

3) The I-35 bridge

The I 35 bridge in Minneapolis is perhaps the most well known landmark illuminated with LED lights. LED street lights installed here provide adequate illumination to the five lane bridge and its 13/ 14 foot shoulders. Not only was glare minimized, the lighting level was perceived to be of high uniformity. One of the team members evaluating the lighting quality remarked that it was as if the bridge was lit by “a full moon on a clear night”.

![Expert committee members evaluating the I 35 bridge lighting](image-url)
Choosing the Best LED Light

When choosing a LED light to suit your needs remember that you are not buying a bulb but a light producing system with several components. Each of these contributes to making a great LED light bulb. Follow the simple pictorial guide below to select the best LED product.

![LED Light Source](image1)
![Optics](image2)
![Electronics](image3)
![Certifications](image4)
![Made in USA](image5)

Want to know more about this path breaking technology? Visit us at [http://www.myledlightingguide.com/](http://www.myledlightingguide.com/) or call us at 1.888.423.3191 between 8-5 PM, Monday to Friday. Our wide range of “Made in USA” product range allows us to meet almost any requirement from off the shelf products. We also offer financing options to facilitate your ownership of the world’s greenest lighting technology.