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Why LED lamps are getting darker

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The LED light source module is generally composed of a substrate, a chip, a packaging material, a lens, etc. In daily use, the long-time operation of the LED easily causes the LED to become darker and darker, and even the light fails. For this problem, D.L. Barton has done research experiments.

There are some reasons for the failure of the LED light source module. Generally, the following are the main points:

1. The packaging material is degraded;
Under long-term work, the LED will cause the temperature of the LED to rise, resulting in a large decrease in the optical transparency of many polymers in the LED exterior packaging material (such as epoxy resin), resulting in a decrease in the light-emitting efficiency of the LED;

The study found that when the LED temperature reaches 95 degrees and the current is greater than 40 mA, the LED package material will be carbonized;

2. During the LED package soldering process, the electrode is contaminated by droplets, oil stains and dust, which may lead to poor solder joint welding;
Solution: Test the relevant position to ensure that the product quality is ok. At present, the most widely used non-destructive X-RAY equipment in the market, its powerful penetrating power can detect LED bubbles, welding bubbles and other defects;

3. The selection of solid crystal glue, it needs to be noted that some raw materials have high brightness, but poor thermal conductivity, especially high temperature, it is easy to cause the material to peel off the wafer, causing short circuit;
For LED defects, the biggest problem is package soldering, so companies need to pay more attention before and after packaging to ensure that the LED package is OK, no bubbles or soldering defects.

LED 光源模块一般由基板、芯片、封装材料、透镜等几大核心组成，在日常使用中，LED 长时间的

作业容易导致 LED 越来越暗，甚至出光失效，对于这个问题，D.L.Barton 等人曾做过研究实验，

LED 光源模块的失效原因很多，一般主要有以下几点：

1，封装材料退化；

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LED 在长时间工作会促使 LED 的温度升高，导致 LED 外表封装材料（如环氧树脂）内的许多聚合物的光学透明度的大幅度下降，进而引起 LED 出光效率的下降；

D.L.Barton 实验发现当 LED 温度达到 95 度，电流大于 40mA 时，LED 封装材料就会出现碳化现象；

2，LED 封装焊接过程中，电极被液滴、油渍，粉尘污染，容易引发焊点焊接不良；

解决方案：在焊接前后对相关位置进行检测作业，以确保产品 OK，目前市场使用率最广泛的无损检测设备是 X-RAY 检测，其强大的穿透力可以检测到 LED 气泡、焊接气泡等不良；

3，固晶胶的选材问题，需要注意，有些材料亮度高，但导热性差，，特别是高温容易促使材料剥离晶片，造成短路；

对于 LED 缺陷，最大的就是封装焊接的问题，所以企业在封装前后需要多加注意，确保 LED 封装 OK，没有气泡或者焊接缺陷。