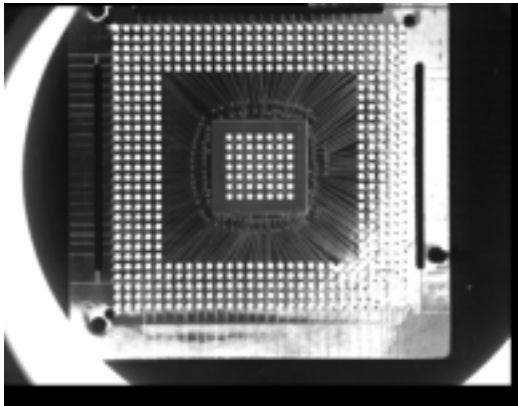


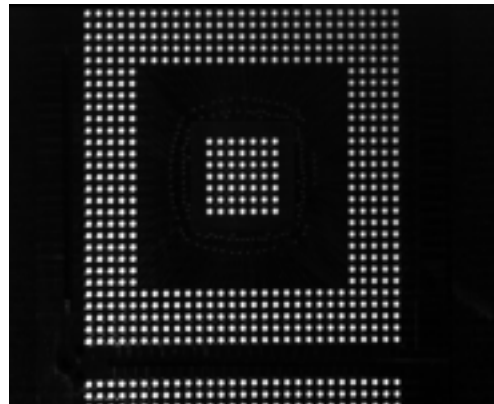
APPLICATION NOTE: 211

Application: Ball Grid Array Inspection

Problems: 1) Low Contrast Issues



Fluorescent Ringlight



LED Lightbar

Solution:

The **spectral distribution** of a lightsource plays a large role in machine vision applications. Halogen and fluorescent sources typically have broad spectra covering the visible range and the near infrared (NIR). However their spectral output distributions are not evenly distributed. The fluorescent spectrum is rather jagged and has several strong peaks in the blue region. Halogen lamps are typically smooth but produce more red light. Many times one may wish to limit the output of a lightsource to a specific spectral region to improve contrast, one easy way is to use LED's.

The image on the left shows poor contrast between the Ball Grid Array and the underlying circuit. Using red LED's the image on the right becomes nearly binarized. The contact array made of gold reflects red light very well and appears bright. The green circuit becomes very dark because the LED does not emit light in the lower portion of the visible spectrum. The high contrast image produced needs very little processing. This decreases the amount of computational power required to find a defect thereby increasing the speed at which inspections can take place. LED's also require little maintenance and have long lifetimes.

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