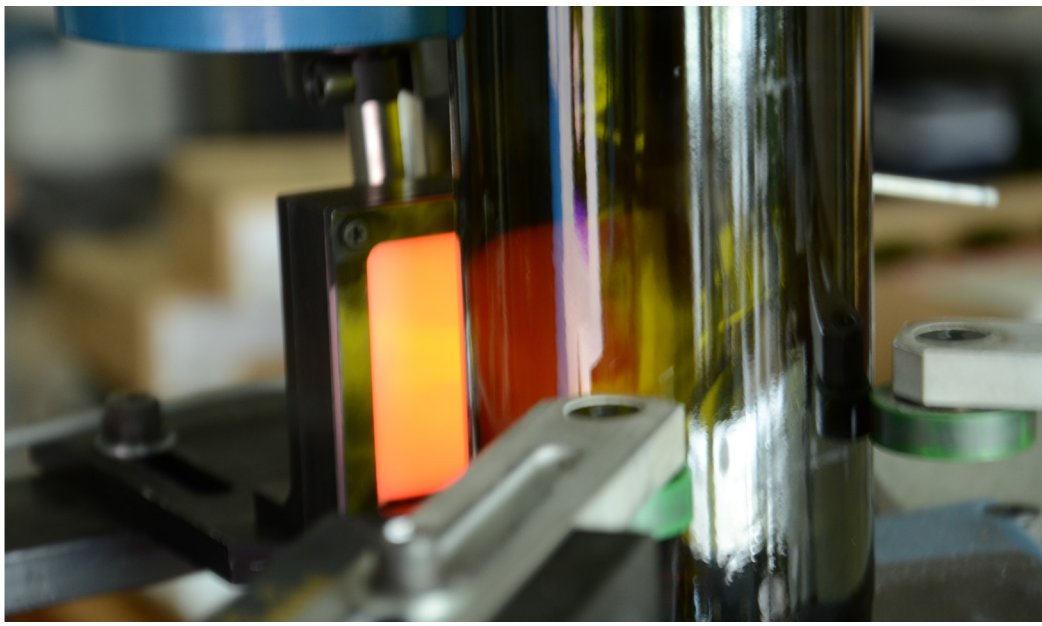
Owens-Illinois Case Study

Company:	Owens-Illinois
Industry:	Packaging/Food & Beverage
Product:	IR Backlight
Description:	Infra-Red Backlight for Bottle Inspection



Owens-Illinois, Inc. (O-I) is the world's largest glass container manufacturer and the preferred partner for many of the world's leading food and beverage brands. Headquartered in Perrysburg, Ohio, USA, the company employs more than 24,000 people at 81 plants in 21 countries and in 2017 had revenues of $6.8 billion. O-I delivers safe, effective and sustainable glass packaging solutions to a growing global marketplace.

Requirement

To detect defects on glass bottles O-I required compact infra-red backlight illuminators. The wavelengths, uniformity, intensity, and strobe capabilities needed in addition to the compact size required, were the key challenges presented by this project.

Solution

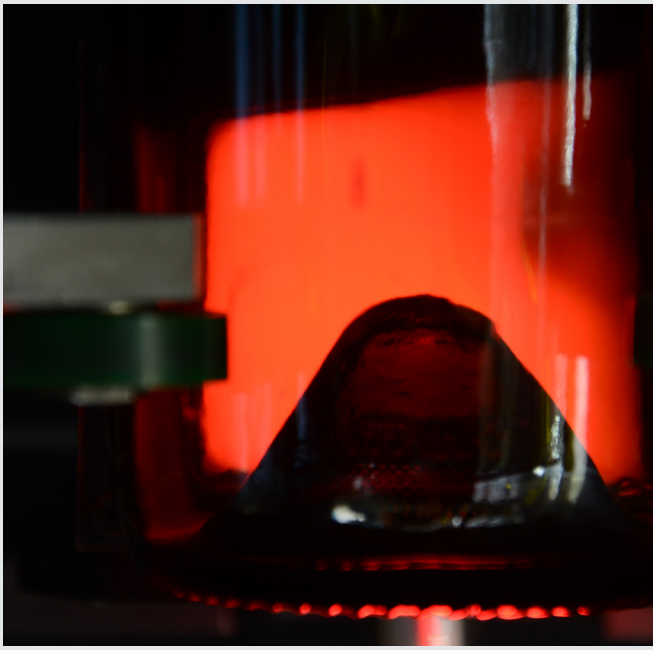
ProPhotonix Custom IR Backlights

Owens-Illinois produces glass containers for many of the world's leading food & beverage brands. The shape, color, opacity and design of the bottle varies significantly. To ensure the quality of their product, they design and manufacture vision systems that inspect every aspect of the bottles they produce and identify any production with cracks, chips and stresses in the glass and later determine the fill level.

When developing a new system to detect these defects in the manufacturing process, they chose ProPhotonix as their development partner due to our reputation for building compact, high intensity solutions. The result was two custom products, the first being a 740nm panel light and the second an 870nm panel light.

Wavelength

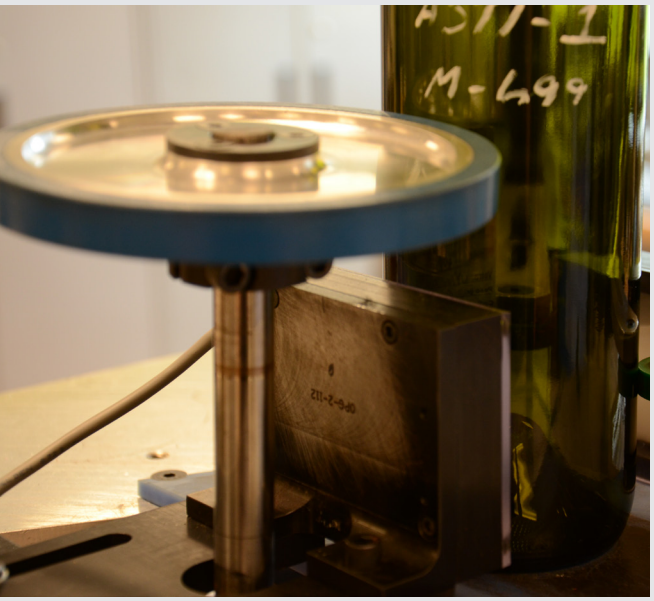
The vision system was developed to detect defects in darker glass containers prior to filling. Infra-red illumination is required to penetrate the darker types of glass bottles that pass through this inspection point.



ProPhotonix has been a pioneer in Chip-on-Board technology which has resulted in the ability to offer solutions with the widest range of wavelengths on the market. Our engineers worked with Owens-Illinois to provide a variety of infrared products of differing wavelengths which enabled them to perform testing and identify the ideal solution for their vision system.

Even, Uniform, Intense illumination

One of the key challenges of the project was the ability to achieve the demanding intensity requirements from an illuminator that was compact enough to fit in the system. The intensity needed to be high enough to penetrate the glass to ensure that the vision system delivered a clear image. To meet this intensity requirement, ProPhotonix designed a Chip-on-Board LED array incorporating 340 LEDs into a 52.5mm X 69mm product.



The engineers designed the optical system including the optimum diffuser to provide the even, uniform illumination while minimizing the distance required between the LED array and the diffuser. This attention to detail on the optical design contributed significantly to the compactness of the overall solution.

Size

For many manufacturers, the space constraints coupled with the intensity requirements of this project would have proven insurmountable. There were constraints both in terms of the depth of product that could be tolerated and its width. The space designated for the illuminator was between the conveyor and a roller system, which were already in place.

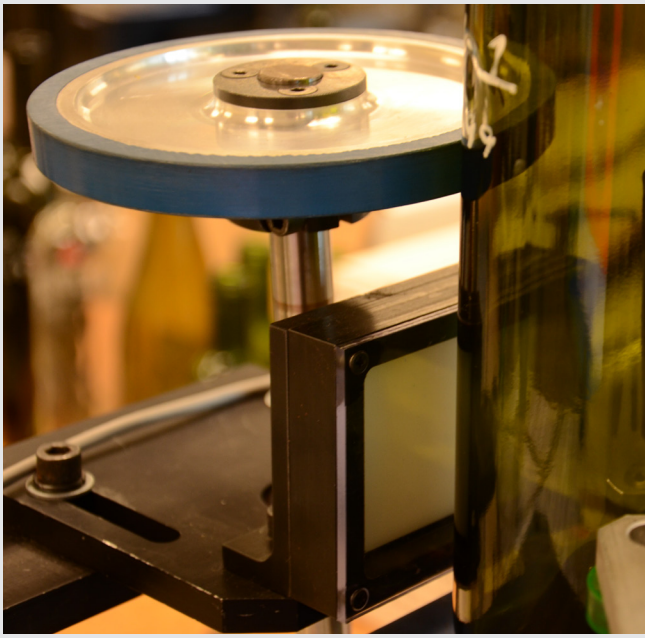
In every element of the design process, ProPhotonix considered the space constraints. From the use of Chip-on-Board Technology, to optical, thermal and mechanical design, every effort was made to minimize the illuminator's footprint. The final product design is only 7.4mm thick, which could only have been achieved through the combination of Chip-on-Board technology and our expertise in optical and mechanical design.

"No other manufacturer could achieve the size of product that ProPhotonix did."

Stephen, Physicist, Owens- Illinois

Strobe Capability

To realize the required intensity and maximize the product lifetime, Owens-Illinois wanted to strobe the illuminator. ProPhotonix' has a wealth of experience in the design of electronics for high current strobing in applications such as machine vision and ANPR. This extensive experience ensured that we could quickly deliver a solution to O-I which allowed them to strobe at 18A and achieve significant increases in the product's intensity while reducing the project timescales.



"ProPhotonix is the first company that I think of when I need a specific wavelength or have an unusual requirement. This is true not just for me but also for other engineers I work with at Owens-Illinois whom I have introduced to ProPhotonix."

Stephen, Physicist, Owens-Illinois