

Shining light on laser phosphor illumination

Over the last few years, interest in laser-based projectors has been increasing within the ProAV industry. Touted as a major technological development that could eventually replace traditional lamp-based systems, manufacturers are bringing various laser-based projectors to market and describing them using terms such as pure laser, laser phosphor, or laser phosphor hybrid.

For customers, laser-illumination provides several benefits over lamp-based projectors, however, it's important to understand some of the differences between these new systems.

Pure laser, also known as 3-Primary (3P) or RGB laser, generates light directly from three individual red, green and blue lasers. The primary benefit of a RGB laser system is light output while also achieving higher performance in other standard image quality parameters such as color gamut, contrast ratio and dynamic range when compared to standard lamp-based systems. As such, RGB laser is ideal for large-format applications and cinema.

Laser phosphor illumination, such as what's used in the Christie® GS Series, uses a blue laser diode as the light source instead of a high intensity discharge (HID) lamp. To generate the three primary colors, the laser diode shines laser light onto a phosphor wheel to create yellow light, while blue laser light passes through an opening in the phosphor wheel. The projector then sends the yellow light through a color wheel to generate red and green, while the blue laser light passes through a diffusion window. These red, green and blue colors are then directed onto an imaging surface, such as a DLP® chip, which sends the light through a lens and onto the projection screen. The advantage of a laser phosphor projector is the long life of the illumination system before



▲ The Christie GS Series 1-chip DLP projectors employ laser phosphor illumination.

it reaches 50% brightness. As a lampless system, laser phosphor also eliminates the need for lamp and filter replacements, reducing the down-time, maintenance and costs associated with lamp-based projectors. The long-life and low maintenance of laser phosphor projectors make them ideal for corporate boardrooms, classrooms and location-based entertainment.

A laser phosphor hybrid projector is similar to a laser phosphor system, but with the addition of a second or third light source (usually LED) to boost the amount of red color being produced.

Certain manufacturers claim their laser phosphor projectors provide "maintenance-free" operation. Be wary of such claims. Although it is true that laser phosphor illumination systems are solid state and do not require any maintenance throughout their lifecycle, this only applies to the light engine. Laser-based projectors are still subject to regular maintenance such as cleaning fans and lens to maximize efficiency and performance.

The development for laser-based projection is an exciting prospect. With increased brightness, performance capabilities and long-life, customers will be able to reap the benefits of these new systems. However, as with any new technology, it is important to understand exactly what these new advancements offer.

Christie GS Series

With the launch of the GS Series, Christie has introduced its first laser-based projector. Using laser phosphor illumination, the Christie GS Series provides an astonishing 20,000 hours of operation and eliminates the need for lamp and filter replacements, drastically reducing the down-time and maintenance associated with lamp-based projectors.

Features:

- Lampless, 1-chip DLP projector
- 24/7 operation
- Three resolutions: HD, WUXGA, WXGA
- Full suite of lenses
- Wireless connectivity
- Small footprint, low-weight, quiet operation
- Blend and warping capabilities
- Full connectivity

Contact Christie

Contact Christie today for more information on laser phosphor illumination.

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