# Shining light on laser phosphor illumination

Over the last few years, interest in laser projectors has been increasing within the ProAV and cinema industries. 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, and 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.

Christie HS Series
Available in WUXGA and HD resolutions, with up to 13,500 lumens, Christie BoldColor Technology, a compact design and super-quiet operation.

Pure laser, also known as 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-scale applications and giant screen cinema.

Laser phosphor illumination, such as what's used in the Christie® GS Series, Captiva Series and the HS Series uses blue laser diodes as the light source instead of a high-intensity discharge (HID) lamp.

To generate the three primary colors in a 1DLP® laser phosphor projector, 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 directs the light through a lens and onto the projection screen. The primary advantage of a laser phosphor projector is the long life of the illumination system before it reaches 50% brightness. As a lampless system, laser phosphor also eliminates the need for lamps and, in many designs, 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 high-use settings like boardrooms, classrooms, houses of worship, museums and location-based entertainment venues.

▲ Christie Captiva Series
Ideal for tight spaces, comes in standard HD and ultra-wide aspect ratios, and offers multiple mounting positions, interactivity capabilities and a host of easy-to-use features.

▲ Christie GS Series
Combine laser phosphor illumination and 1DLP technology for excellent image quality, reliability and 20,000 hours of low-cost operation.

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A laser phosphor hybrid projector is similar to a laser phosphor system, but with the addition of other non-laser light sources (usually LED) to boost the amount of one of the primary colors being produced. Although not considered a hybrid projector, the Christie HS Series and Christie DHD850-GS projector both feature BoldColor Technology which employs blue and red laser diodes as well as a patented optical chamber and specialized software to produce enhanced color and saturation compared to typical laser phosphor projectors.

Certain manufacturers claim laser phosphor projectors provide "maintenance free" operation. 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 lenses to maximize efficiency and performance.

With increased brightness, performance capabilities and long-life, customers will be able to reap the benefits of these new systems.


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