

NEW REVENUE OPPORTUNITIES

Stacy Hoge outlines some of the benefits of working with LED curing technology

LED curing technology opens the door to new revenue opportunities with more press uptime, higher yields, and the ability to print on heat-sensitive substrates, offering increased profitability for printers. Solutions offer higher print quality, faster curing speeds, and a more reliable curing process. New profit streams become available with the LED technology benefits, in addition to saving energy and eliminating replacement part costs.

The return on investment can be quite fast due to the operating savings and benefits. Users have reported saving more than \$20,000 per month after adopting LED curing technology, offering significant return on investment in a short period.

USER EXPERIENCES

LED curing technology offers many benefits that will increase users' printing capability and generate more revenue. Here are some contributing factors from users:

MORE UPTIME:

LED curing units have been proven to support trouble-free press operation. There is no warm-up time due to the instant on/off nature of LEDs. There are no moving parts, shutters to clean or bulbs to replace, leading to higher press usage and operator efficiency. LED also offers higher yields due to consistent energy output.

FASTER THROUGHPUT:

Printers with LED technology perform at 20 to 30% faster speeds on average, assuming other portions of the work-flow can operate at the higher speeds.

LESS HEAT:

With no IR (infra-red) heat, printers can utilise heat-sensitive materials offering new capability.

GREATER STABILITY:

Because of the uniformity and long-term consistency of LED lights, designers can develop safer, more stable, and more reliable processes for printing. LEDs last more than 20,000 hours of operation, with only a minimal drop-off in power over the life of the curing unit.

MORE COMPACT DESIGNS:

Floor space is valuable in all types of businesses. LED light sources can be used to build more compact printers that minimise waste.

QUALITY CURING:

Users report that LED light sources produce higher quality cures and better adhesion on a wide range of materials, including recycled materials.

ENERGY CONSUMPTION:

Users can save up to 50% or more on energy bills. Energy cost savings can be substantial, particularly if power costs continue to rise.

SAFER WORKPLACE:

LEDs contribute to workplace safety because they don't generate dangerous UV-C radiation, excessive heat, or noise. In addition, the 395nm wavelength UV-A light is not harmful to the eyes.

Besides being mercury-free, LED light sources generate no ozone. The rising tide of

government regulations is causing all types and sizes of manufacturing firms to be more proactive in adopting safer, less toxic equipment and processes. This is where LED curing can really be a plus. Companies that have already installed more environmentally sustainable printing processes report that it has helped them attract younger workers and more customers that prefer eco-friendly processes.

RELIABILITY AND LIFETIME

Although LED curing technology has been around since 2002, there have been significant technological advances in LED efficiency and curing performance. The initial challenges have been met and overcome, allowing rapid technology adoption across a broad array of industries. Thankfully, LED light sources have now been architected to have exceptionally long lives, improved thermal management to avoid overheating, and high quality UV output for a longer period of time. Similar to the lighting industry, LED curing technology has been proven to be extremely reliable and customers can reap the benefits of the technology.

Even though LED technology is reliable, it is important to keep in mind that LED light sources are not created equally. Suppliers of LED light sources have significant architectural and implementation decisions that significantly impact their products' performance. The end result will be a LED curing system with optimised LEDs, arrays, optics, and cooling for a specific application. Knowing how to characterise the performance allows users to identify the best overall system to meet their specific needs.

If maintained properly, LEDs have a long lifetime. Traditional mercury lamps may last up to 3,000 hours but properly managed LEDs will



LED curing technology



Direct printing to containers is an ideal application for UV LED

last more than 50,000 hours. With impressive efficiency and longevity LED technology is poised to be an energy efficient technology.

In 2015, Phoseon Technology announced the lifetime testing of their lamps has now surpassed 50,000 hours of operational on-time with irradiance being greater than 80% of its original output when the test first began five-plus years ago. For perspective, utilising a single shift workweek of 2,000 hours/year, 50,000 hours equates to 25 years of UV LED operating on-time.

LED CURING APPLICATIONS

The UV curing process has been in use in the printing industry for more than thirty years. LED curing technology for UV printers is rapidly replacing older technology with compelling advantages of better economics, system capabilities, and environmental benefits. LED curing technology is ideal for the UV curing of inks in digital inkjet, screen, flexographic and other printing processes.

CONTAINER DECORATION

UV LED technology is used for both digital and screen-printing on cylindrical containers. Curing screen-printed inks on plastic and glass containers is an ideal application for UV LED because of the small print area and need for a compact curing unit that can easily fit into the printing machine.

POSTERS AND SIGNAGE

The sign-making industry has led the change for improved turnaround times, higher quality and more economical solutions for printers that serve this segment of the market. UV LED curing technology enables output on a wider media mix and an extended range of applications, while at the same time allowing for a low total cost of ownership.



A typical example of a digital printer with LED UV curing

CODING AND MARKING

The compact UV LED curing light sources offer advanced capability and increased production speeds for coding and marking applications. The LEDs are instant on/off, so the UV is only on when ink curing has to occur. This saves energy and increases the life of the unit even further. With virtually no maintenance, low operating cost, and faster throughput, UV LED curing is the ideal choice for high-resolution variable data printing on a wide variety of substrates.

LABELS AND PACKAGING

LED curing systems are ideal for label and narrow web printers, enabling end users to print high quality material at maximum speeds. UV LED curing for label printing shows measurable advantages in higher productivity, lower energy usage, reduced heat load for thinner substrates, smaller footprints and clear environmental benefits.

CONCLUSION

More and more users are choosing LED curing light sources for printing processes because they deliver advanced capabilities, improvements in operating economics, and environmental advantages. Printers that utilise LED curing technology have reported significant return on investment in a short period. Users can expand the range of applications they can offer, run equipment at higher speeds, achieve new levels of print quality, use substantially less energy, reduce scrap, reduce VOC emissions in the work-place, and print on lower cost or more environmentally friendly materials. ■

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