

Case Study

Application: Screen Printing Nameplates & Graphics



FireFlex UV LED Curing Light Source

- *Proven Reliability*
- *Superior Performance*
- *Innovative Technology*

Nazdar Develops Screen Inks for UV LED Curing

Advances in the last year in Phoseon LED light source technology and UV screen printing ink formulations have proven LED curing as a viable alternative to curing with medium-pressure mercury lamps. Phoseon's 4 watt and 8 watt systems have shown to provide the output required to cure Nazdar's 2400 LED curing membrane switch ink and Nazdar's 2600 LED graphic ink.

Curing UV Inks

Photoinitiators used in screen printable UV inks typically react to specific wavelengths within the 200 to 400 nanometer range. UV light triggers photoinitiators creating "free radicals". The free radicals connect with the molecules of the resins and monomers, and they, in turn, cross-link with each other, forming chains of molecules we recognize as the "cured" ink film. Although photoinitiators are most reactive at specific wavelengths, the overall curing

reaction or polymerization is achieved by the broad absorption range.

Intensity & Dose

For UV/LED inks to cure properly, they must not only be exposed to the correct wavelengths, but a sufficient amount of energy needs to be directed to the surface of the printed substrate. The amount of energy is called the dose and is measured in millijoules (mJ/sq cm). The dose of energy a print receives is affected by the conveyor/belt speed as well as the number of times that it is exposed to the UV light sources.

Screen Inks Available

Until recently, the available UV screen inks have not been able to be used with LED curing. They did not have the processing latitude to overcome the restrictions of using LED light sources: lower wattage and single nanometer output. Nazdar has adopted new ink technologies to formulate viable

inks that cure exceptionally well with 4 watt and 8 watt LED 395 nanometer light sources at belt speeds of 30 to 120 ft/min. This curing speed range is directly related to the ink's color, the ink deposit, and the substrate color.

Benefits of LED

The market is starting to see practical light sources and inks coming into the market. The benefits to converting to LED curing are many, including: reducing operating cost, reducing emissions, reducing the use of mercury containing bulbs, and increased safety. The most significant savings is the reduction of energy usage.

Nazdar Acknowledgments
Bea Purcell is Nazdar's market-segment manager for the membrane-switch overlay, in-mold decorating, industrial, and container markets and Laura Maybaum is the Graphics Market Segment Manager.

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