The Practical Relevance of Solid State UV LED's for the Curing of Inks in Contemporary Ink Jet Applications.

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Abstract

The use of solid-state UV emitting LED technology as a light source for the curing of UV inkjet inks has received much "hype" over the past 2 years. UV LED's offer apparent significant advantages in terms of durability; consistency; low power consumption; low heat emission; and instant switching, and yet their uptake is almost insignificant in what is undoubtedly a buoyant and rapidly growing market.

This is in the main due to the incompatibility of current chemistry formulations, in conjunction with other barriers such as economics and intellectual property issues.

A key problem has been the belief that this technology could displace current UV light sources in existing applications thereby placing unrealistic expectations on this emerging technology, instead of looking at complimentary or new applications where UV LED's may offer significant advantages.

At present UV Led's cannot generate sufficient spread of wavelength nor until recently sufficient energy to fully cure current ink formulations, (however they can readily partially cure or "freeze" / "pin" such inks). More importantly LED's remain a more expensive solution in a highly cost sensitive industry.

Far better to look at practical and realistic applications for this technology, applications that cannot be readily achieved with traditional UV light sources. Some such examples of are:

- Curing of inks on Glass (where only partial cure is necessary followed by a thermal post-cure
- Curing between print-heads in a linear high resolution print engine
- 3 D modeling systems
- Electronics manufacturing
- "Pinning " cure on static web fed print engines
- Curing of special resins in fat panel display manufacturing or other similar product assembly

In conclusion, Solid state LED light sources will not displace current UV technology, but used intelligently will compliment it. We can expect to see a slow emergence of new chemistries especially formulated for UV LED's combined with an increase in the usable output from LED devices and a gradual easing of the current prohibitive costs..

Author Biography

Adrian Lockwood is a graduate of the University of Manchester and has been involved at a senior level with the technology and manufacture of UV curing equipment since 1977. He worked for such companies as Colordry, Spectral and Nordson UV before co-founding Integration Technology in 2000 – a UV equipment business that works exclusively in the digital and inkjet markets.

He has authored many technical papers and is a frequent speaker at international conferences. He is also a Fellow of the Royal Society in the UK and an Associate of the Institute of Packaging.

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