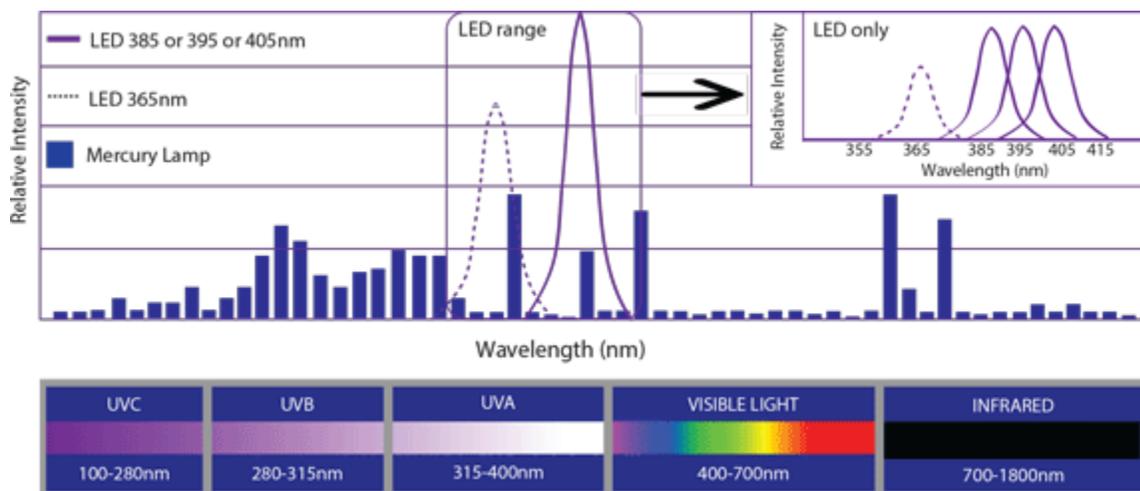


## UV LED for Screen Printing Inks:

In my article “UV Bulb Type Selection” I discussed how different additives to the mercury vapor lamp shifts the UV light output toward the lower visible range. The reason this is desirable for screen printing inks is because the thick ink layers (vs Flexo or Offset printing) inhibit complete through-cure due to absorption of the light by the pigment. This is especially true of inks containing white (titanium dioxide) pigment. Light around 380-450nm has a better capability to penetrate through the ink than the lower wavelengths produced by the H-bulb (standard Mercury Vapor). Therefore, I use and recommend the use of the Iron and Gallium doped bulbs for screen printing inks. But what about the new LED UV lamps?

The new LED UV lamps output a narrow band of light wavelengths. Conventional lamps output UV, some visible, and IR. When I formulate a screen printing ink for conventional lamps I use a blend of photo-initiators to capture as much of the different spectra that I can. And the IR radiation (heat) does speed up the curing reaction and must be managed using chill rollers or plates so that it doesn't damage the substrate. LED UV inks must be formulated for the specific wavelength of the lamp otherwise expensive photo-initiators will be used and wasted because they don't absorb the output of the lamp.

Here is a diagram from the Phoseon website that shows the output wavelengths of their LED lamps vs a Mercury lamp.



I experimented with the early Phoseon products about 10 years ago and it was possible to develop screen printing inks that worked with the units they made at that time. Now they have increased the power output significantly which will result in better cure and higher line speeds. The 3 possible wavelengths that can be used will allow specific formulations to be developed that will through and surface cure the inks thoroughly. Other significant benefits: longer lamp life, less energy consumption, and less damage from heat at the substrate.

Functional Inks' Industrial Screen printing inks are formulated with the best photo-initiators available to take advantage of the lamp's output. I can customize the inks to the substrate and the LED output to maximize performance of the ink. Please contact me at 413-363-0770 to discuss an application.

Paul Giusto

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