

Red Diamond 620suv Spin-coating, Ultraviolet Curable OLED Fluid Product Data Sheet

Version 2

Polymertronic' organic light emitting diode (OLED) emissive layer can be deposited by spin-coating methodology. It can be spin coated onto poly(3,4-ethylenedioxythiophene) poly(styrenesulfonate) (PEDOT:PSS).

Benefits Of Spin-Coating Fluid

1. Simple methodology
2. Film thickness as low as 100nm
3. Works with Polymertronics' OLED Science Kits



How Spin Coated OLEDs Work

This solution is the emissive layer of the active portion for use in a multi-layer organic electronic device. Wherein the active portion is between the anode and cathode layers. The light emitting material is solution based in a volatile solvent carrier. The carrier quickly evaporates during the spin-coating process, leaving a uniform film across a PEDOT:PSS coated substrate.

Spin coating is a means of depositing a thin film, on a flat substrate, that is uniform across its surface. The substrate is spun at high speed in a horizontal plane. The fluid is deposited whilst the substrate is spinning and is spread across the substrate by centrifugal force.

The thickness of the film on the substrate depends on five key parameters:

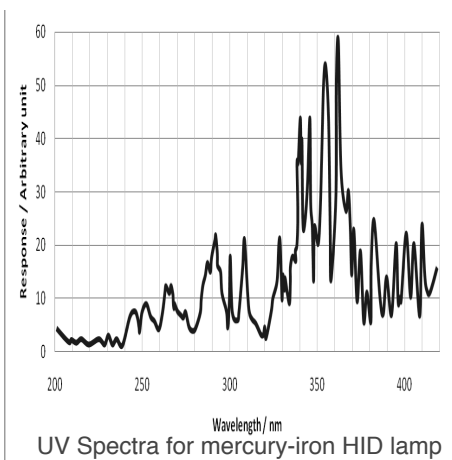
1. Rotational speed of spin-coater
2. Spin time
3. Surface wetting of substrate
4. Fume extraction
5. Temperature

How Ultraviolet Curing Works

Ultraviolet curable fluids contain polymer molecules that link together when exposed to ultraviolet light (energy) of a wavelength that the polymer can absorb. This results in the polymer molecules within the fluid linking together to form a film, This process is called cross-polymerization.

Ultraviolet light is in the bandwidth 200 - 400nm of the electromagnetic spectrum. It is at the blue end of the visible spectrum. Ultraviolet light is split into three groups:

1. UV-A (200 - 280nm)
2. UV-B (281 - 315nm)
3. UV-C (316 - 400nm)

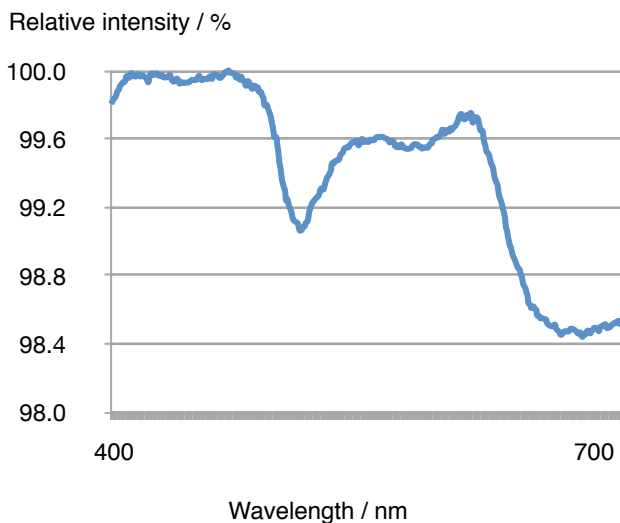


Mercury-iron (Hg:Fe) high intensity discharge (HID) lamps deliver a wide spectrum in the ultraviolet segment of the electromagnetic spectrum.

The photoinitiator wavelength is 254nm, the wavelength of greatest intensity from Hg:Fe arc lamp.

Mercury-lead (Hg:Pb) arc lamps will work, but are less effective than Hg:Fe. This is due to less emissions in the 254nm region. UV-LEDs emit no UV below 370nm.

UV curing is faster if it is conducted in an inert environment such as nitrogen gas. The exclusion of oxygen speeds the reaction for the reason that oxygen impedes the cross-linking process.



The UV component transmits 99.6% of light once cured.

Transmission spectrum through cured polymer component

Polymertronics' Expertise

Polymertronics' products are designed to be out-of-the-box and simple to use. The product range is for businesses and educators who want to understand OLED technology and to develop products for market:

1. Flexible, rigid and inkjet printable OLED Science Kits for experimenting with OLEDs
2. Ultraviolet curing expertise and equipment for printable electronics
3. Electronic drivers for optimizing OLED performance
4. Solid state lighting development products and expertise
5. Full product development capability for applications
6. *Center-Point* for finding resources and answers to queries

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