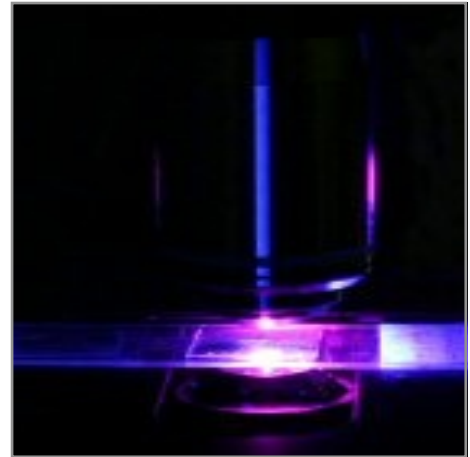


Ultraviolet 50W LED Curing System Product Data Sheet

Version 2

This is an 'out of the box' ultraviolet (UV) curing system designed for researching printed electronics with ultraviolet curable components and for high-volume production of UV curable fluids.

Polymertronics' HID curing system is a programmable system designed specifically for printed electronics. How the UV is delivered is critically important. The PC interface offers precise control of all UV curing parameters.



UV Curing

Benefits Of Ultraviolet UV-LED Curer

1. Solid-state LED technology
2. Instant light-on and light-off
3. Reduced fluid spread across flat substrate
4. High durability of photo-cured polymer device
5. Reduce 'drying' times
6. Reduce 'drying' space requirement
7. Lower carbon footprint
8. Less material wastage
9. Higher product yield
10. Instant encapsulation of printed electronic devices for testing
11. Tailored programming of system for use with heat sensitive substrates
12. Reduced production processes and improved process efficiency



Polymertronics' ultraviolet curing systems for printed electronics systems have received accolade of a European technology award for manufacturing.

How Ultraviolet Curing Works

Ultraviolet (UV) curable fluids contain polymer molecules that link together when exposed to light of a wavelength that the polymer can absorb the energy of. The process is called cross-polymerization.

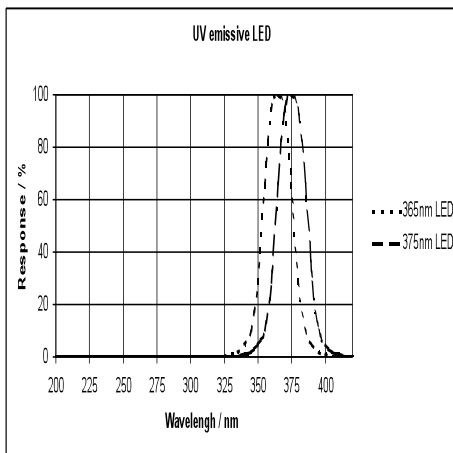
Ultraviolet light is be bandwidth 200 - 400nm of the electromagnetic spectrum. It is at the blue end of the visible spectrum. UV light is split into three groups, UV-A (200 - 280nm), UV-B (281 - 315nm) and UV-C (316 - 400nm). UV light from mercury-iron (Hg:Fe) have the greatest UV output at 224nm:

There are two different types of ultraviolet bulbs. The gas within the bulb determines the emission spectra:

1. 365nm \pm 5nm peak emission
2. 375nm \pm 5nm peak emission

The curing time is dependent on a number of factors. The curing material is clear/opaque, so it will transmit light, more than absorb it. UV curable Colour inks that can be cured with the LED UV curer must have their peak absorption at 365nm. Some UV curable inks may need to finished with a xenon, or UV arc lamp where wavelength below 345nm are required.

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.



UV Spectra for mercury-iron HID lamp

UV-LEDs are arranged in two-dimensional die packages to deliver an area of UV light. The power of a UV-LED is within a narrow bandwidth, see left. Some UV curable inks are designed for absorbing 375nm, or 395nm.

Ultraviolet Curing For Manufacture

For production applications, the ultraviolet curer can be fitted to existing manufacturing setups, or integrated into new production systems. This ultraviolet curer has an intelligent diagnostics for faults and for maintenance.

Advantages for production environments:

1. Capable of high travel velocities when fitted to a manufacturing platform
2. Easy, low cost bulb change
3. Intuitive graphic user interface
4. Can be retrofitted to existing manufacturing platforms
5. Rapid identification and elimination for fault finding
6. Reduced downtime and maintenance support costs
7. Low ongoing running costs
8. Suitable for small footprint products and platforms
9. Suitable for moving applications
10. Plug and play for any international voltage level

Ultraviolet Curing For Research and Development

The benefits of using this ultraviolet curer for research and development is that it can deliver accurate and variable ultraviolet light intensity timed to within 20ms to initiate curing in cross-linkable polymers and to measure the degradation of printed electronic materials.

Advantages for research and development:

1. Continuously variable power levels
2. Multi-stage programmable exposure intensity levels
3. Programmable exposure times
4. Identification of minimum process power levels
5. Identification of optimal curing times and intensity
6. Research UV degradation of electronics devices
7. Perform accelerated UV life testing
8. Create repeatable test programs
9. Generate of record history for analysis
10. Analysis and tailoring of optimal curing protocol
11. Analysis and identification of optimal thermal environment
12. Control over chemical reaction and intensity dose

Note: E²M Technology reserves the right to amend this product's specification and/or look of the product without updating this data sheet, or any other promotional information.

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

Polymertronics Contact Details

Polymertronics
Bloxham Mill Business Centre
Barford Road
Bloxham
Banbury
Oxfordshire
OX15 4FF
United Kingdom

Telephone: +44 (0)1295 722 849
Email: mail@polymertronics.com
Website: www.polymertronics.com



The Institution of Engineering and Technology
Polymertronics is a business partner of the IET technology community



Note₁ : Polymertronics reserves the right to amend this product's specification and/or look of the product without updating this data sheet.

Note₂ : Polymertronics is a subsidiary of E²M Technology Limited, United Kingdom.