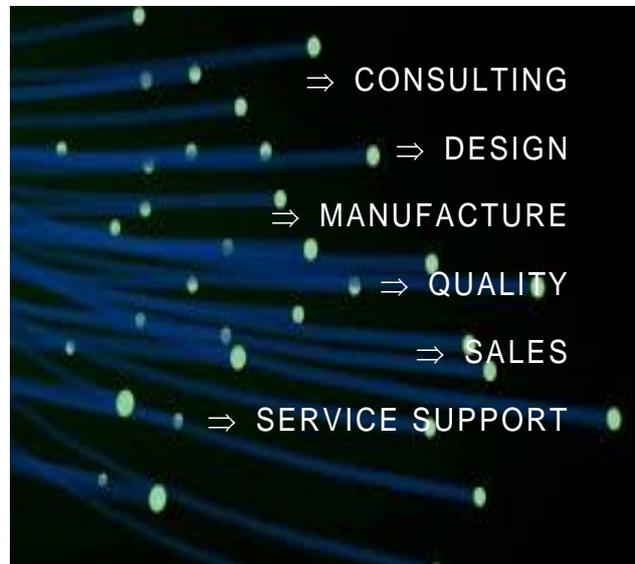


LED UV



UV LED Product Series

SMC UV CURING SYSTEMS



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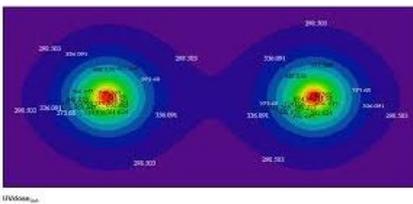
ADVANCED CURING SOLUTION WITH CONTEMPORARY DESIGN

INNOVATION & QUALITY

Verentia relies on high-quality materials and precise workmanship to produce high quality UV systems be it for Bio Science, Curing, printing or Disinfection market. Verentia has developed an innovative UV LED dryer for curing all types of UV coating and adhesives. Depending on the material requirement, the system is available with UV LED curing lamps. Thanks to its compact design, the system can be adapted to suit any production environment



HIGH STANDARDS IN DESIGN, MANUFACTURING AND QUALITY



Industrial and medical fraternity at hospitals encounter various tasks, surgeries, examinations and treatments. Hygiene in the workplace is almost constantly challenged. Disinfection Performance and reliability of medical equipment is therefore especially paramount., at the same time, the subject of economic efficiency gains in importance. Intelligent and high quality disinfection solutions help to reduce ongoing operational costs significantly at the same time improving customer trust significantly.

PROUCT DESIGN AND FLEXIBILITY

The use of UV LED technology permits high Irradiance, optimized thermal design allows low heat build-up, a maintenance free service life, high efficiency, high Fluence and thus maximum economic viability. We do more than just design, develop, manufacture and supply electronic power supplies and UV lamps, we specializes in tailoring our UV/LED equipment to our customers' unique technology needs and business environments

HIGH IRRADIATION, DIFFERENT WAVELENGTH & COMPACT DESIGN

TruspectraUV comes with inbuilt high performance LED with high Irradiance factor to suit individual needs of the customer from 230nm to 405nm. TruspectraUV offers unparalleled ease in controlling different wavelength through specially designed electronics which is integrated inside the compact and aesthetic housing at the same time thermal engineering support long life and ease in maintenance.

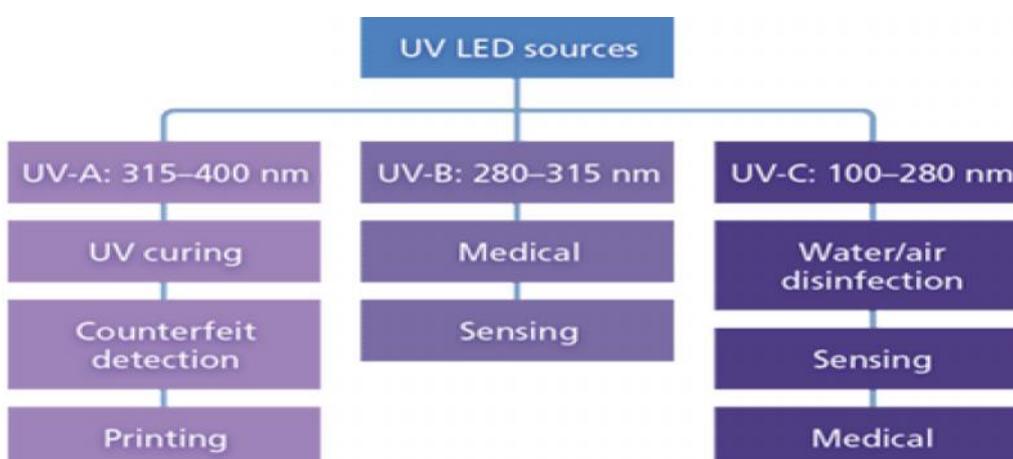


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APPLICATION OF UV LED IN INDUSTRY, BIO SCIENCE AND DISINFECTION

INDUSTRY APPLICATIONS

Visible-spectrum LEDs have penetrated into TV and mobile backlighting, automotive, general lighting, signage, and other markets, ultraviolet (UV) LEDs are just beginning to replace incumbent UV sources in diverse applications, including curing, counterfeit detection, medical, sensing, printing, and water/air disinfection.



230 to 400 nm: optical sensors and instrumentation

230 to 280 nm: UV ID verification, barcodes

240 to 280 nm: sterilization of surface areas and water

250 to 405 nm: forensic and bodily fluid detection and analysis

270 to 300 nm: protein analysis, drug discovery

300 to 320 nm: medical light therapy

300 to 365 nm: polymer and ink printing

375 to 395 nm: counterfeit detection

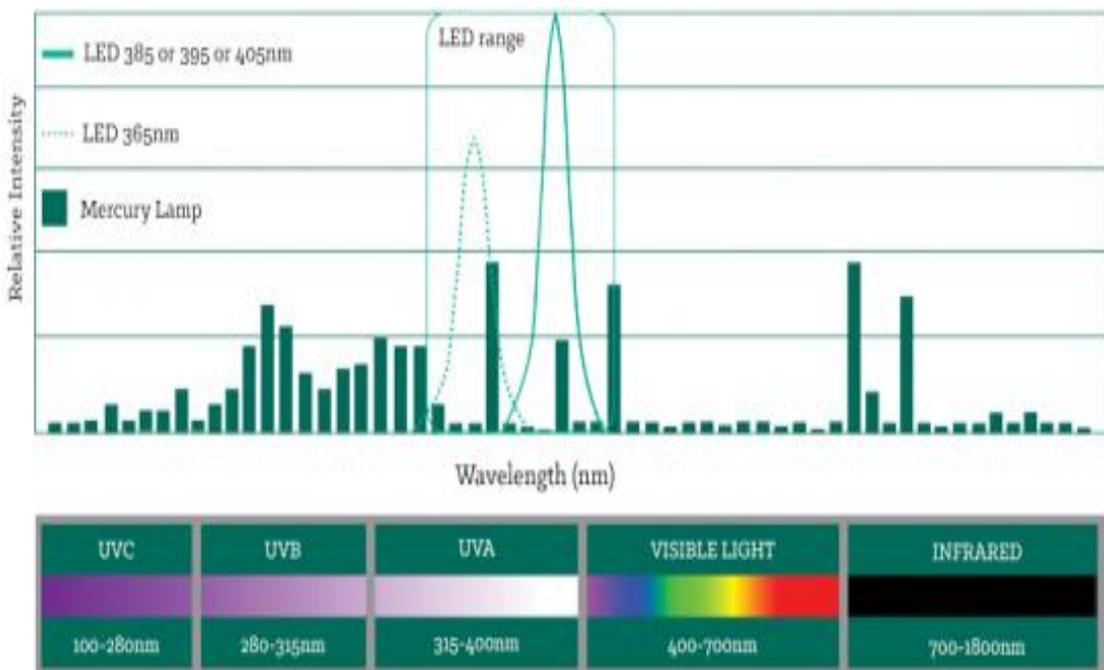
390 to 410 nm: superficial / cosmetic sterilization



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EXPERIENCE THE FUTURE OF UV LED CURING SYSTEMS

UV curing is a process in which ultraviolet light and visible light is used to initiate a photochemical reaction that generates a cross-linked network of polymers. UV Curing is adaptable to printing, coating, decorating, stereo lithography and assembling of a variety of products and materials owing to some of its key attributes, it is: a low temperature process, a high speed process, and a solvent less process., cure is by polymerization rather than by evaporation.



The typical light source spectrum wavelength ranges from Ultraviolet Light (UVC 200-280nm, UVB: 280-315nm, UVA 315-400nm) to Visible Light (400-760nm) and Infrared Light (760-3000nm).

UV LED sources have a concentrated narrow spectral emission. LED sources are typically described by their peak emitting wavelength, but in practice UV LED sources emit in a distribution that is typically +/-20nm from the specified peak. For example a “395nm” LED source typically emits 96% of its energy between 380nm and 420nm with the distribution being essentially Gaussian.



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ADVANCED UV LED CURING CORE SYSTEM STRENGTH

CORE STRENGTH AND CUSTOM SOLUTIONS

Verentia is leading manufacturer of UV and LED based solutions. With solid core strength in designing custom solutions, we understand that our customer need tailor made solutions suiting their process with quality, performance and timely



delivery. Our expertise and experience means that we can rapidly deliver the most precise, efficient and cost effective solution, ensuring that our customer gets maximum performance and value from our systems.

Verentia strength in LED, optical, thermal, CFD and related technology allows us to offer wide range of wavelength available in the market. We specialize in creating custom solutions with multiple wavelength. High Performance optics provides **Peak Irradiance** 27W/cm² (365nm) and 34W/cm² (405nm). **Advanced thermal solutions** provides long land maintenance free life of UV led module

At Verentia we utilize **Chip-On-Board** technology to create compact, high Irradiance and uniform light source. Product Design encapsulates LEDs, arrays, optics and cooling to maximize curing performance. We also specialize in thermal, optical and PCB engineering to manufacture intricate LED arrays to complex turnkey solutions. **Small and compact solutions** with reduced footprint is ideal for space constraints. Flexible and scalable to suit process and production requirements.





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UV LED BASED SMC CURING SYSTEM ADVANTAGES

CONNECTING YOUR BUSINESS TO THE TECHNOLOGY RESOURCE YOU NEED FOR YOUR SMC/COMPOSITES CURING APPLICATIONS

LED is reliable and mature technology, LED lamps reliably provide reduced downtime, long lifetimes, and low costs of ownership

Flexible form factors, LED technology is fundamentally a more compact technology than traditional lamps due to the LED packaging densities. Chip-on-Board (“COB”) LED technology describes the mounting of bare LED chips in direct contact with a substrate to produce LED arrays

Multi wavelength capability, LED sources provide users with greater opportunity to optimize their curing system by designing a multi-wavelength system that closely matches the absorption spectrum of the media being cured leading to greater production efficiencies

Precise control each of the LED in circuit can be individually controlled by dedicated driver circuitry. This localized control of LEDs allows for more precise adjustment of the LEDs to improve overall stability and uniformity

Stability and efficient, electronic control allows the light-output & intensity of the LEDs to be kept stable for a long time. further this level of control is scalable from a couple of LEDs to thousands of LEDs.

Reduced downtime: the UV LED lamps windows are routinely cleaned to remove the cured material. Apparently Verentia UV LED can be specified with a removable window where the window can be quickly exchanged for a new one reducing downtime



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ADVANCED CURING SOLUTION WITH CONTEMPORARY DESIGN

CONNECTING YOUR BUSINESS TO THE TECHNOLOGY RESOURCE YOU NEED FOR YOUR SMC CURING APPLICATIONS

Heat Sensitive substrates, Very little heat is generated from the LED output onto the substrate being cured. This characteristic of LEDs is important for applications where heat sensitive substrates are utilized

Instant switch on, LEDs are instant-on, and can be configured to output light in continuous, flashed or pulsed modes across a wide dynamic intensity range while maintaining the desired spectral distribution.

Real time monitoring, To ensure stability across the lifetime of the lamp, various monitoring functions can be built-in to the lamp such as thermal monitoring of the LED substrate temperatures, short circuit monitoring, or in-rush voltage protection.

Environmental friendly, LEDs are more environmentally friendly than traditional technologies because they emit no harmful UVC or contain toxic heavy metals, such as mercury. LEDs can also tolerate higher ambient operating conditions than traditional lamp technology.

Ease of installation & cost benefit, LED systems offer significant benefits over the life of the lamp. Mercury lamps have short lifetimes and require frequent replacement. LEDs do not require ancillary components such as filters and venting system. Operating costs of LED based systems is also lower due to instant-on/off. Thus supports extended lifetime of the LED over mercury UV lamps..



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SMC UV CURING APPLICATION NOTES



Verentia TruSpectra UV cure systems can be designed for various wavelength to suit the requirement of the coatings. TruSpectra also features inbuilt optics designed to have uniform Irradiance and Fluence over SMC which enables TruSpectra to cure the coating efficiently within the designed dwell time. One critical aspect to using or adopting UV-curing technology for composites manufacturing is the need to match the type, power and intensity of the light source to the application.

Also important is an understanding of the best way to present the part to the UV light in order to optimize the process.

In the UV-curing industry as a whole, however, the dominant trend is toward UV LED lighting. Although more expensive than lamps up front, LEDs offer several advantages. As semiconductor devices, they are more energy efficient and have a much longer service life than arc lamps: Useful life in excess of 20,000 hours, compared to a typical arc lamp life of 1,500 hours. LEDs also are monochromatic devices: they emit light within a narrow bandwidth at the UV spectrum's upper range (380-400 nm)



Photo initiators, and a variety of newer ones, are used in several applications, including cured-in-place pipe (CIPP), lamination winding, pultrusion, preforming, as well as gel coats. Although the majority of UV-curing composite applications employ unsaturated polyester or vinyl ester resins, a variety of resin-photo-initiator systems have been developed, and development work continues till date.

Although heat-curing and UV-curing composites are both employed in CIPP applications, the latter is experiencing a significant upturn. With either, the basic principle is to repair a damaged or corroded pipe by placing a pipe liner within a pipe. UV-curable resins for CIPP applications now own a large share of the market globally. Resin suppliers working in concert with pipe liner manufacturers have been able to optimize the initiator packages to successfully UV Cure liners at thicknesses 12.7-19 mm. Liners with thicker walls facilitate the repair of larger-diameter pipes with higher loading requirements, thereby enlarging the window of potential trenchless-pipe applications.



One unique benefit to the use of UV-cured liners is that they can facilitate pipe/liner inspection before cure, improving the chances of a flaw-free installation: Once in place, the liner ends are sealed, the tube is inflated with air, and a camera attached to a light train is pulled through the pipe. On the way, the camera is used to conduct an inspection of the liner's entire length. When the inspection is finished, the light train is pulled back through in the other direction, with a UV light activated for curing. In theory, a similar system could be used to inspect a *heat*-curable liner (sans UV light source), which is cured by flooding the tube with heated water, but the additional cost and extra step would be prohibitive

UV-curing technology is a best fit for high-value *and* high-volume applications, today, the changing dynamics in the automotive and aerospace markets especially the greater demand for lightweight materials, such as composites is and will undoubtedly create fresh opportunities for the inherent benefits provided by UV-curing technology.



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INNOVATIVE, RELIABLE AND EXCELLENT BENCHMARK PERFORMANCE



Wavelength	365	385 / 395	405
Peak Intensity	27 W/cm ²	27 W/cm ²	34 W/cm ²
Irradiance window	25 x 15	25 x 15	25 x 15
System Power	15.4W	15.4W	14.2W
Estimated head life expectancy			
Operating Ambient temperature	35 °C	35 °C	35 °C
Operating Ambient humidity	75%	75%	75%
Cooling method	Heat Sink / Heat Pipe / Chiller		
Chiller Capacity	250W to 550W		
Chiller Flow rate	1.5LPM—5 LPM		
Pressure Drop	0.0018-0.0022 Bar		
Connections	8" NPT		
Warranty	1 year		
Voltage and frequency			
Potential free error signal	Earth Fault, Total Error, Lamp Error, Phase Loss, Over Temperature, Output Signal UV Ready, Phase Loss, UV ON		
Finish	Matte black		



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INNOVATIVE, RELIABLE AND EXCELLENT BENCHMARK PERFORMANCE

Irradiance values	<ul style="list-style-type: none"> 1 - 7 W/cm² 8-17 W/cm² 18-26 W/cm² 27-35 W/cm² 36-50 W/cm²
Emitting window length	<ul style="list-style-type: none"> 25 - 100mm 125 - 225mm 225 - 350mm 350mm - above
Cooling Method	<ul style="list-style-type: none"> Heat Sink Heat Sink with cooling fan Heat Pipes Heat Pipes with fan Water cooling
Wavelength	<ul style="list-style-type: none"> 365nm 385nm 395nm 405nm
Applications	<ul style="list-style-type: none"> Adhesive curing, wood coating curing Fiber optic curing Counterfeit, Fluorescence Lithography Printing (Ink) curing Optical coating SMC coating curing

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VERENTIA

VerentiaSol India Private Limited

Gat 1101, Pune Saswad Road,

Behind Vatika Ashram,

Wadki, Pune - 412308

Maharashtra, India

Mobile +91-8169868690

Email: shree.katyayani@verentia.com

Verentia reserves the right to change the design and drawing in the best interest of the customer without any notice whatsoever