

LED UV

ADVANCED UV SOLUTIONS WITH
CONTEMPORARY PATENTED DESIGN
FOR WATER, INDUSTRY, MEDICAL
AND BIOSCIENCE



UV LED PRODUCT SERIES
WOOD COATING UV CURING APPLICATIONS

- ⇒ CONSULTING
- ⇒ DESIGN
- ⇒ MANUFACTURE
- ⇒ QUALITY
- ⇒ SALES
- ⇒ SERVICE SUPPORT



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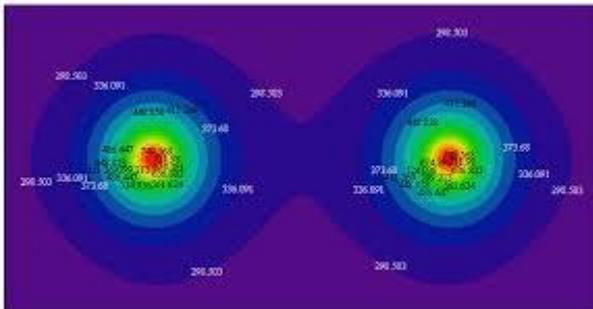
ADVANCED UV LED SOLUTIONS WITH CONTEMPORARY DESIGN

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



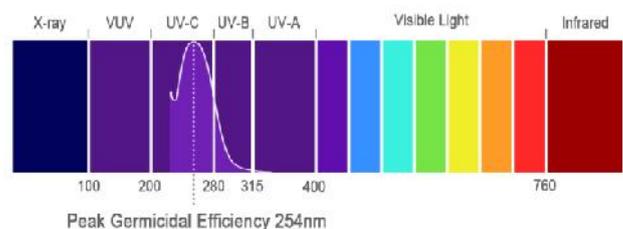
Industrial and medical fraternity at hospitals encounter various tasks, surgeries, examinations and treatments. Hygiene in the workplace is almost constantly challenged. Disinfection Performance and reliability of medical equipment is therefore especially paramount., at the same time, the subject of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

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 unparalled 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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ADVANCED UV LED SOLUTIONS WITH CONTEMPORARY DESIGN

CHALLENGING APPLICATIONS

For the most challenging applications, off-the-shelf lighting solutions cannot deliver the performance you need to optimize your system. Often designed for a wide range of applications, these off-the-shelf products simply cannot deliver the same results as a custom LED solution that is designed specifically to meet your requirements

CHIP ON BOARD TECHNOLOGY

At Verentia, we utilize Chip-on-Board technology to create compact, high intensity and uniform LED light sources. We design and manufacture products, from intricate LED arrays to complex turnkey solutions, integrating custom optics, electronics, mechanics and software to provide the best possible solution.

CUSTOM SOLUTIONS

Verentia strengths in LED engineering and related technology allow us to offer the widest range of wavelengths available on the market. We specialize in creating custom LED solutions that utilize multiple wavelengths or non-visible wavelengths such as UV & IR solutions. The strength of our relationships with LED suppliers means that we are always up-to-date with the latest in LED technology.

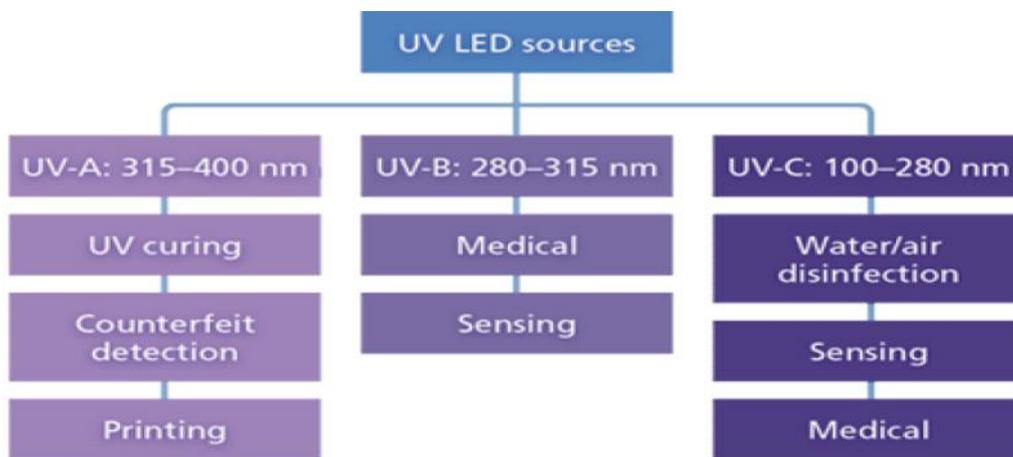


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APPLICATIONS OF UV LED IN DISINFECTION, INDUSTRY AND BIO-SCIENCE

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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UV CURING PRINTING SYSTEMS SALIENT FEATURES

- ◇ High Performance UV LED **Peak Irradiance** 27W/cm² (365nm) and 34W/cm² (405nm)
- ◇ Industry is preferring over traditional drying methods as the results are much better, rejection rates are low, superior bonding and the entire process improves the solvency and scratch resistance of the product.
- ◇ UVA led is especially used in paper and wood coating industry as it is more energy efficient, losses very little heat and can be manufactured with much smaller foot print with far better optical design then traditional UV lamps.
- ◇ The **Truspectra UV** has an electronic with an option for modulation of power supply for effective UV discharge with a maximum power output of 0.1KW to 7.5KW.
- ◇ **Advanced thermal solutions** provides long land maintenance free life of UV led module.
- ◇ Precise control allows the system to modulate the performance in accordance with customer product curing and printing requirements.
- ◇ **Small and compact environmentally friendly (no mercury) solutions** with reduced footprint is ideal for space constraints
- ◇ Flexible and scalable to suit process and production requirements.
- ◇ Continuously variable power/Irradiance control. Service-friendly due to pluggable connections
- ◇ Applications in curing of Adhesive, coatings, inks, wood curing applications, UVA flexographic printing, counterfeit detection, forensics applications, fluorescence, sterilization





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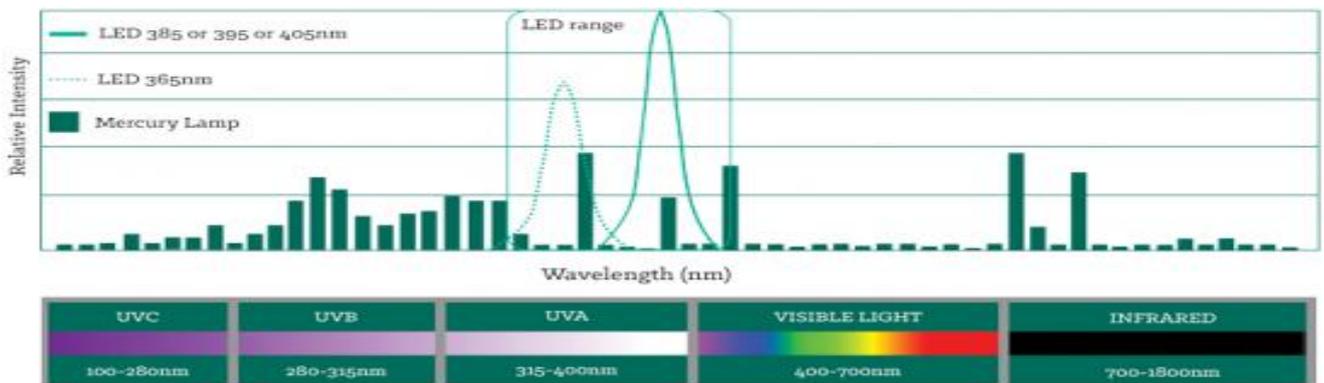
EXPERIENCE THE FUTURE OF UVA LED WOOD COATING CURING SYSTEMS

Business today must cope with global competition, soaring labor rates, and increased regulations associated with air emissions, waste disposal, and safety and health. Managing an industrial wood finishing operation is demanding, and survival in today's business climate is not possible by ignoring these issues. For the wood finisher, it is essential to use finishes that are less labor intensive and are applied and dried fast to facilitate high-production speeds. They must also have a low impact on the work and natural environment. New technology is making a dramatic impact, but the transition to new finishes and their associated processes can be costly to implement and time consuming to learn.



The industrial wood finisher has essentially three options in types of UV-curable coatings to use —

- 100% UV,
- water-reduced UV and



Each type of UV-curable coating can be applied by virtually any method of application. The selected method of application is dependent on the surface structure/property to be finished, the finish quality desired on that surface, and the production rate that finishing must conform to. The selection of the UV-curable coating type applied by any method is really a matter of finish build or thickness, the ease to achieve certain finish subtleties (gloss, leveling, etc.), and the ease of use of the coating system.

100% UV-curable coatings can be used to produce the desired finish quality, it is best to set a course of action to use them. Costs, operation expenses and reporting requirements will be most advantageous with 100% UV-curable coatings. If very thin film builds are desired, less than 100% actives may be necessary and the use of **water-reduced UV-curable coatings** is most preferential. Water-reduced UV-curable coatings present significant advantages vs. solvent-reduced forms due to potential safety and air reporting



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UV CURING SYSTEM—VARIED APPLICATIONS FOR PRINTING

WOOD UV CURING OPENS UP DOOR TO NEW MARKETS

100% UV Curable

UV-curable coatings are liquid coatings that do not contain any evaporative solvent or water. Their nature is entirely active chemistry that converts directly to a solid finish upon exposure of the applied coating to ultraviolet energy. Since there is no requirement to dry the coating, the wood surface can immediately exit the application section of the finishing line and enter the UV-curing zone or UV “oven.” Cure is instantaneous and parts exit the UV oven ready to be handled in the next stage of production. A very significant advantage with 100% UV-curable coatings is the fact that the excess coating may be re-used. Overspray, overflow from roll and flow coat operations, doctored excesses and other collected UV coating from other methods of application all may be captured for re-use .

Large Processing Speeds can be achieved to process Large 4' x 8' panels and doors by UV-curable coatings via reciprocating, rotary, and stationary spray guns at process speeds between 0.120—0.20 m/s

Water Reduced UV Curable

The demand for water-reduced UV-curable coatings is predominant in high-volume door and panel finishing operations. These surfaces typically have a low-build appearances comparable to that created with traditional or conventional solvent borne coatings. UV-coating manufacturers offer water-reduced UV-curable coatings that are between 30-45% solid or active. The coatings are easily applied, dried and UV cured to provide excellent finish appearance, durability and resistance

Water-reduced UV-curable coatings permit excellent gloss and viscosity control and, therefore, apply easily with minimal or no process issues with VOCs/ HAPs. Pigmented versions are available, and the use of many universal type colorants offer the capability of custom color matching. Any method of application can be used, although it is most common to see spray and vacuum coat lines in operation

Solvent Reduced UV Curable

The finishing process associated with conventional solvent-based coatings is well established and understood by most industrial wood finishers. Therefore, it is a simple transition for finishers who wish to make the switch to solventreduced UV-curable coatings. The same process equipment can be used including pumps, applicators, and drying ovens, and the addition of a UV -curing oven will complete the process change

UV-curable coatings perform similarly to thermoset coatings offering maximum durability and resistance to chemicals and water. The action of UV curing, however, is exceptionally rapid and very desirable from a wood finisher's perspective. Solvent -reduced UV-curable coatings offer the wood finisher the easiest means to reduce labor and maximize productivity, but do not offer the most optimum system from a regulatory point of view

The use of solvents enables effective viscosity reduction, especially in the use of very viscous UVsensitive components that may be present in the coating formulation. Therefore, monomer content can be minimal and issues associated with wood penetration and incomplete UV cure can be avoided. Leveling, flow, atomization, coating uniformity, surface film build control and other properties can be controlled by using reduced forms of UV-curable coatings. Compared to water-reduced forms, solvent usage enables more rapid drying and thereby faster production rates with lower energy consumption



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ADVANTAGES OF UVA LED FOR PRINTING AND LITHOGRAPHIC INDUSTRY

CONNECTING YOUR BUSINESS TO THE TECHNOLOGY RESOURCE YOU NEED FOR YOUR CURING AND PRINTING 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

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.

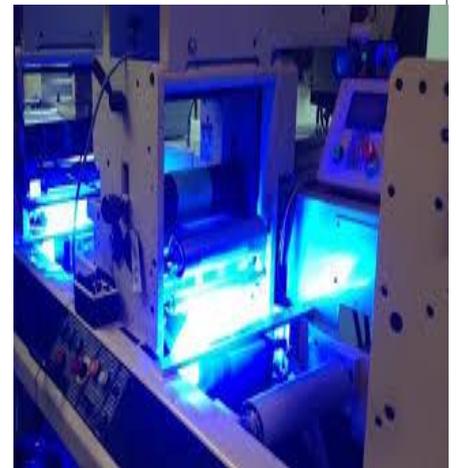
Ease of installation & cost benefit, LED systems offer significant benefits over the life of the lamp. Mercury lamps have short lifetimes and require frequent replacement. LEDs do not require ancillary components such as filters and venting system. Operating costs of LED based systems is also lower due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



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UVA LED PRODUCT VARIANTS FOR PRINTING AND LITHOGRAPHIC INDUSTRY APPLICATIONS

Irradiance values	1 - 7 W/cm ²
	8-17 W/cm ²
	18-26 W/cm ²
	27-35 W/cm ²
	36-50 W/cm ²
Emitting window length	25 - 100mm
	125 - 225mm
	225 - 350mm
	350mm - above
Cooling Method	Heat Sink
	Heat Sink with cooling fan
	Heat Pipes
	Heat Pipes with fan
	Water cooling
Wavelength	365nm
	385nm
	395nm
	405nm
Applications	Adhesive curing, Wood Curing
	Counterfeit, Fluorescence
	Lithography
	Printing (Ink)





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TYPICAL PRODUCT SPECIFICATIONS FOR CURING, PRINTING AND LITHOGRAPHY INDUSTRY APPLICATIONS



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 time	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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