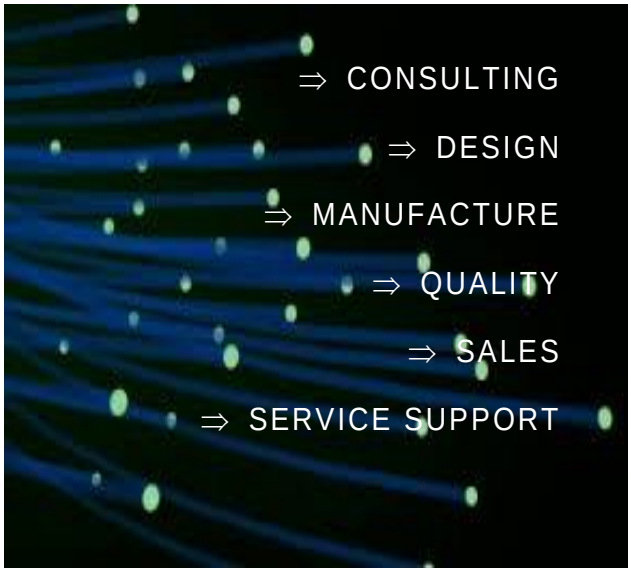
LED UV PRODUCTS AND SOLUTIONS

TruSpectra

Enable Spectrum Productivity

UV LED Product Series

AUTOMOTIVE UV CURING SYSTEMS FOR GLASS/PLASTIC SUBSTRATES



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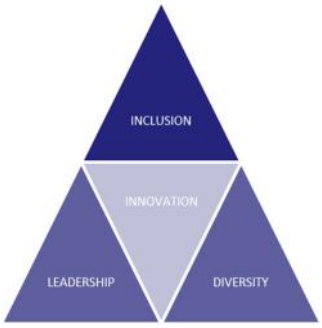
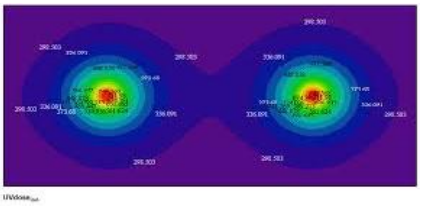
ADVANCED CURING SOLUTION WITH CONTEMPRORARY DESIGN

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 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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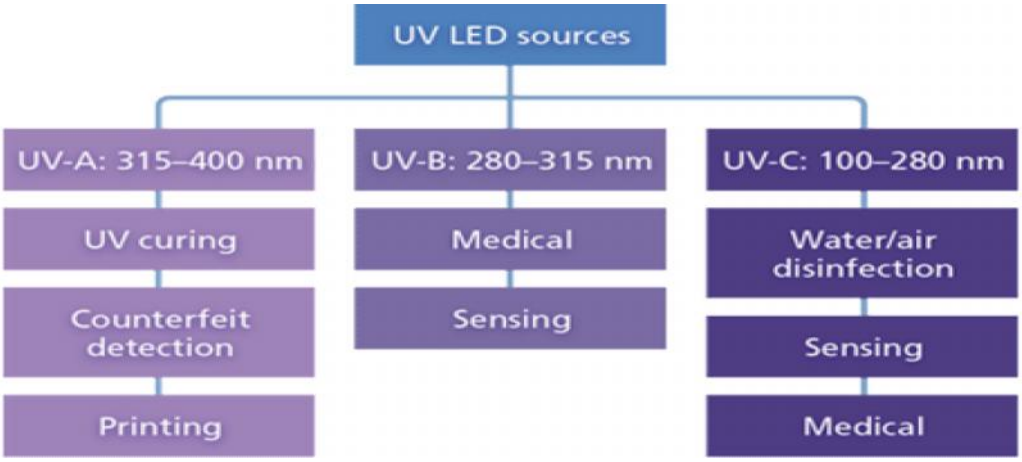
APPLICATION OF UV LED IN INDUSTRY, BIO SCIENCE AND DISINFECTION

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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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 CONTEMPRORARY 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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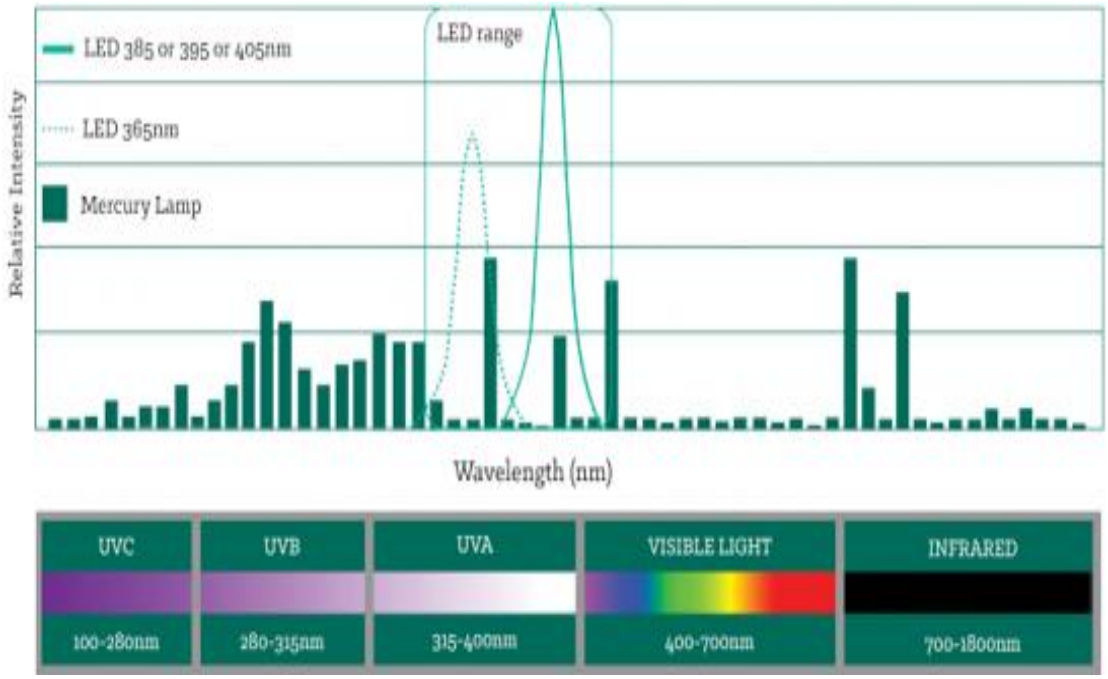
EXPERIENCE THE FUTURE OF UV LED CURING SYSTEMS

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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BOOST PRODUCTIVITY WITH UV CURING ADHESIVES

UV CURING IS SLOWLY OCCUPYING ITS MUCH NEEDED SPACE IN SOLAR PV MANUFACTURING

UV curing of polymers is well-known for many applications, including wood coatings, graphic arts, electronics and optics. When many people think of UV-curable formulations, images of hard, scratch-resistant, inflexible and highly cross-linked coatings come to mind. The properties required for new UV markets, such as adhesives, photovoltaics and many electronics applications, have driven raw materials suppliers to develop products that are outside the traditional range of highly cross-linked UV materials

What benefits could there be for adopting a UV-curable process in solar panel production? The photovoltaics industry faces constant pressure to reduce cost per watt, and UV curing provides an avenue to achieve cost reductions. Production time could be greatly reduced – the UV process is an instant-cure, no-postcure, solvent-free process that can be done at hundreds or even thousands of linear feet per minute. In addition, the energy needed to process is much lower than conventional heat-cure systems. Compared to the first-generation photovoltaic panels using a heat-lamination step that can take 15 to 45 min, the UV process is much faster and cheaper.

Performance properties also can be improved with a UV-curable formulation. New raw materials and formulations exhibit much better moisture vapor barrier properties than materials such as ethylene vinyl acetate (EVA). Hardness, flexibility, adhesion, toughness and weatherability all can be tailored by formulation techniques and the selection of raw materials.

New products also are taking aim at extreme exterior weatherability and freeze/thaw/humidity performance. Adhesion to glass, plastics, metals and other substrates can be achieved and maintained through stringent testing such as 85 °C/85 percent relative humidity. Better-performing components can extend the life cycle of solar panels and possibly enable simpler designs by eliminating some protective components such as edge seals in first-generation panels.

The UV cure process benefits second- and third-generation panel makers in particular. With new production lines being set up that can closely mirror a printing process, UV curing is a fast, efficient and effective method for processing adhesives, coatings, dielectrics and even conductive silver pastes. In addition, the UV curing station's footprint is small compared with that of thermal ovens. As many second- and third-generation panels are constructed by layering a "sandwich," the instant-cure and no-postcure aspects of UV curing mean that articles are ready for use, shipping or further processing immediately.

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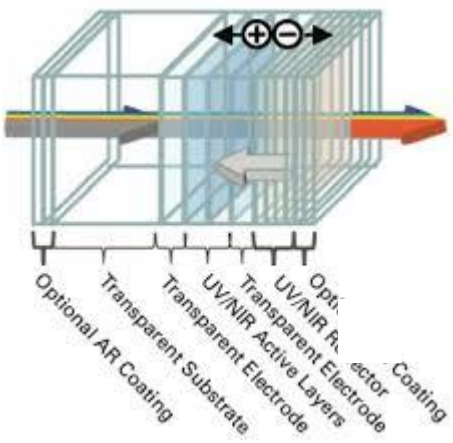
AUTOMOTIVE GLASS CURING AND PRINTING APPLICATIONS

AUTOMOTIVE SWITCHES UV CURABLE HYDROPHOBIC COATING ON SOLAR CELLS FOR SELF CLEANING APPLICATION.

A process for obtaining a low temperature, UV curable inorganic–organic hybrid coating having excellent photoactive properties which is suitable for glass surfaces such as solar cell covers, automobile rear view mirrors and several electronic devices is presented. Nano titania sol having an average particle size of 19 nm has been synthesized using the aqueous sol–gel route starting from titanyl sulphate and was made highly photoactive by crystallizing through a simple microwave treatment which is of considerable importance in the synthesis of hybrid coatings where conventional heat treatment is not possible. The photoactive titania particles were then partially covered by silica particles by optimizing the amount of the silane moiety. A multifunctional monomer composition was further prepared and coated on a solar cell cover glass followed by a second layer coating using photoactive titania particles by dip coating and was cured under UV for six hours. The coated substrate shows photocatalytic efficiency as well as transparency >90% and further, a water contact angle >90°. Titania particles were uniformly distributed on the surface of the top coating as revealed by AFM and the coating had a total thickness of approximately 2.5 μm. The appropriate ratio of organic silanes/acrylates imparts strong adhesion to the substrate, while the inorganic components composed of a hybrid mixture of silica/titania enhanced the self cleaning efficiency. Such multifunctional coatings on solar cell covers have considerable advantage in preventing surface contamination from the exposed atmosphere which decreases the efficiency of such panels in the 15–25% range.



PARABOLIC REFLECTOR UV CURABLE HARD COATING

All of the world's utilityscale parabolic trough systems use glass mirrors because of their high reflectance. However, glass mirrors are expensive, heavy and routinely fracture and break during high winds. The impact of broken mirrors can create a domino effect; that is, falling shards of broken mirror panels can damage other components such as the glass envelopes of receivers and/or other mirrors. Recently, advances in silvered polymer film technology have enabled the production of outdoor-durable lead-free mirrors whose performance is equal to or better than glass, while eliminating breakage and greatly reducing system weight and cost Mirror films provide several key advantages over glass mirrors; however, there is a market perception that the mirror surface should be more abrasion-resistant than the polymers typically used. Therefore, mirror film manufacturers have been faced with the challenge of incorporating an abrasion-resistant coating or similar treatment into their product. UV-curable technology outperforms the other coating technologies across-the-board in terms of post-abrasion reflectance retention. The inherent advantages of energy curable products over many other technologies (in terms of processing speed, overall cost and environmental friendliness) can and will be an important driver for reducing solar device costs

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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 ^{o}C	35 ^{o}C	35 ^{o}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	I 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	1 - 7 W/cm2
	8-17 W/cm2
	18-26 W/cm2
	27-35 W/cm2
	36-50 W/cm2
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 coating curing
	Fiber optic curing
	Counterfeit, Fluorescence
	Lithography
	Printing (Ink) curing
	Optical coating
	SMC coating curing

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