

### **New Expertise in UV Technology**

**Innovation: UV LEDs also for large-surface exposure**

**Boosted productivity and high-quality finished products through simplified production processes and immediate further processing: Those are the key benefits of UV technology. With Panacol AG Dr. Hönle AG – one of the world's leading system suppliers on the UV growth market – has brought a further specialist on board its group and has expanded to become a unique European supplier of trend-setting UV and LED UV technology.**

For an increasing number of industry sectors industrial UV technology is an effective way of achieving faster processing and shorter cycle times, with the resulting cost and energy savings providing a decisive competitive edge. Through the ongoing development of new systems – such as UV LEDs – the possible fields of application of this technology are ever increasing and becoming attractive for a growing number of sectors.

With the merger of industrial UV system supplier Hönle and industrial adhesives supplier Panacol on 1 January 2009 two leading companies within their respective fields have repositioned themselves in this growth market. Bundling the two companies' expertise in the UV sector, the group is now able to develop solutions that are matched even more precisely to the industry's needs as well as offering tailored solutions.

### **UV technology allows simple, rapid curing**

UV technology has many advantages over other curing methods: The adhesives are always single-component and solvent-free; they can be directly processed, making them easy to handle. They have no pot life, so that only the amount actually needed in assembly is used. In addition to cutting costs this has obvious environmental benefits.

UV adhesives are cured mainly with UVA medium-pressure lamps, and this is where the biggest benefit of UV technology lies: its extremely short curing time, which makes the method ideal for highly automated processes.

**Environment-friendly: UV LED is mercury-free**

For a short while now, UV LED technology is being used in UVA – the most commonly used waveband. Unlike conventional UV lamps, UV LED lamps are small, mercury-free semiconductor components that take up little space and can be incorporated in a wide range of systems. Because of their energy-efficiency UV LED lamps can also be used with temperature-sensitive substrates. In addition they can be switched on and off any number of times in quick succession and without loss of power, making them ideal for use in most processes. As a rule, UV radiation is needed for only a short time in the production process. The lamps must therefore be lit for only a short time and can then, in theory, be switched off again. With conventional UV lamps this is not possible, since they require a warm-up time of several minutes before reaching their full output and have to fully cool down before being switched on again. As a result, UV lamps usually remain lit for the entire production time, even when they are not actually used. In shift operation, they may never be switched off at all. In this case the UV lamps' lifespan must be calculated over the lamps' entire operating time.

The advantages of LED technology are obvious: UV LED lamps need to be switched on only when needed, so that its lifespan – which is inherently much longer than that of conventional UV lamps – can be calculated according to its actual usage time. In On-Off operation, UV LED lamps therefore save both energy and cost.

In terms of their short curing times, UV LED lamps can hold their own against conventional UV: Curing with LED lamps takes only marginally longer. Fluorescence inspections to check for a complete, uninterrupted coating can be performed with both LED and conventional UV.

### **With Panacol on board, the Dr. Hönle Group offers the widest available range of UV LED products**

Where monochromatic UV LEDs are used, a suitable adhesive is essential to achieve outstanding results. System technology therefore plays an even more important role with new developments than it does with conventional UV applications. Together, Hönle and Panacol have extensive know-how and experience in this technology and offer a unique range of matched products. With its new UV LED system products – such as lamps and adhesives – the Hönle Group covers both the high-energy range for the small contact areas in the electronics sector as well as larger-surface applications with comparatively low energy.

New on the market is Hönle's bluepoint LED UV point source, which has been developed for applications that require intensive UV exposure. Especially in fully automated production lines the source's high intensity and the possibility of programming complete process sequences – such as exposure sequences with varying intensities and waiting times – help minimise cycle times.

Up to four separately controllable LED heads can be connected to the lamp unit. By fitting special lenses, the focal length of each LED head can also be changed. The UV power output is controllable and its wavelength is adjustable to 365, 400 or 460 nm  $\pm 10$  nm. The bluepoint automatically recognises the LED type and changes its settings accordingly.

In 2007 Hönle presented a further high-performance product: the LED Power Pen. The successor of the proven LED UV Pen features a much higher UVA point source intensity of 3500 mW/cm<sup>2</sup> compared to its predecessor's 800 mW/cm<sup>2</sup>. A further advantage over its predecessor is the possibility of adjusting the focal length with a range of different optics. The compact dimensions and low weight of both pens allow their use even in places that are hard to reach.

### **UV LED systems for curing larger areas**

In Summer 2007 Panacol revolutionised the market with a new UV LED system for curing larger surface areas. With its experience and a wide range of products that also cover low-cost applications,

which are interesting, for example, for bonding glass, Panacol is market leader in UV LED technology. Its programme includes the Panacol UV LED flood lamps with adjustable wavelengths of 365, 395 and 455 nm.

With the UV LED 2000 upstream device up to three LED lamp units can be controlled from a PC connected through a USB port. Another novelty is the Panacol UV LED array. Available in different lengths (280, 500, 750 and 1000 mm), it offers exceptional flexibility, especially in the field of glass bonding. With the arrays, surfaces from 250 to 950 x 10 mm can be exposed. The wavelength of 395 nm is ideal, for example for edge bonding glass panes.

For all UV LED products Panacol develops special adhesives for use in combination with monochromatic LED lamps.

### **Summary**

The number of UV applications is steadily growing and the technology is being adopted in ever more fields of application. The acquisition by the Hönle Group of specialists Panacol and the resulting further development of the bonding systems portfolio through the combination of adhesives and technical equipment further boosts both companies' effectiveness.

UV LED technology will be a key focus of the group's R&D departments. The development of innovative products is set to yield many new possibilities in future. Our new centre of excellence will also develop tailored solutions for specific market needs and for specific industry sectors.

With Panacol on board, the Hönle Group already has Europe's largest range of UV and UV LED products. And that is only the beginning.

### **Box I: Advantages of UV LED technology**

- Usable UV energy without heat generation
- Mercury-free
- No ozone emission
- Long service life – more than 10,000 hours
- Switching on and off without waiting time; no standby time
- Wide range of applications, including low-cost applications

### **Box II: Hönle and Panacol UV LED lamps**

- High-energy UV LED point sources for small-area applications
- Low-energy UV LED flood lamps for large-area applications
- Bonding or fixing components in electronic (LED UV Pen/LED Power Pen), optical and medical (bluepoint LED) applications and in glass processing (LED flood lamps)
- Rapid curing of matched UV products in just a few seconds
- Fluorescence stimulation for materials testing and image processing
- Intensive, virtually monochromatic UV exposure of about 365 nm (LED UV Pen/LED Power Pen) and high-intensity UV exposure (bluepoint LED) for chemical, biological and pharmaceutical fields
- UV LED flood lamps (250 to 950 × 10×mm at 395 nm), for example for bonding glass edges
- Processing of temperature-sensitive materials possible

Illustrations:



Fig. 1) : Hönle LED Power Pen



Fig. 2): Hönle bluepoint LED

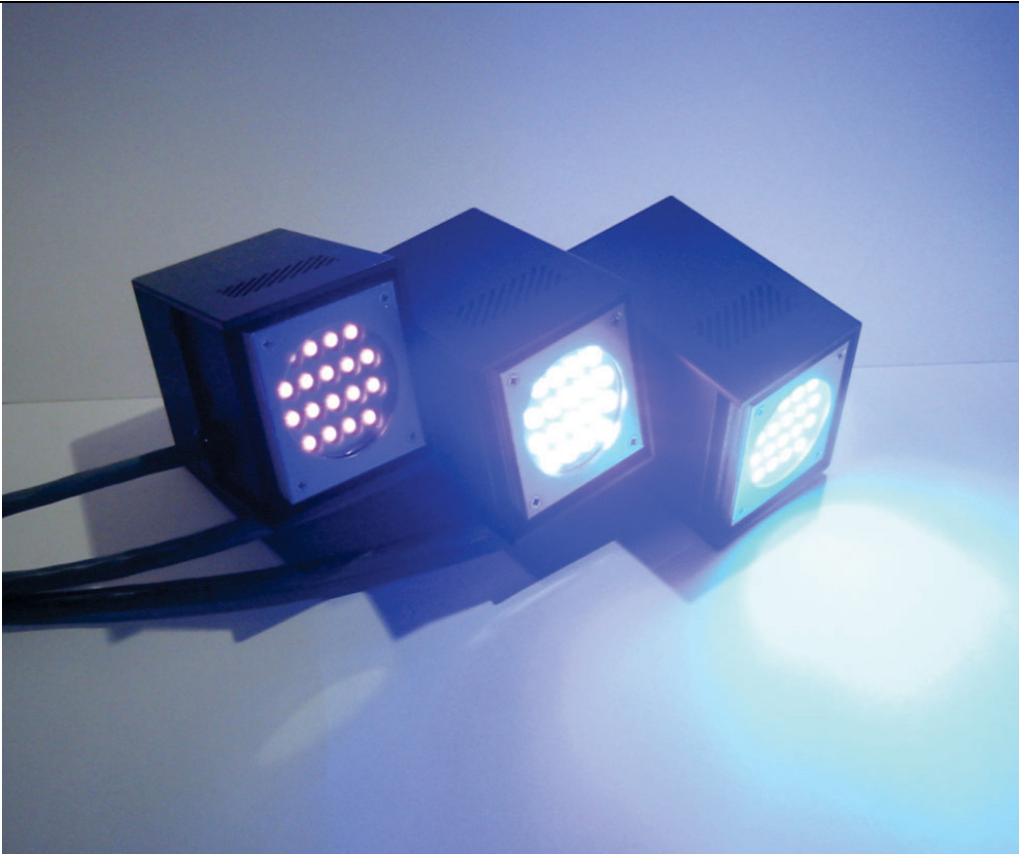
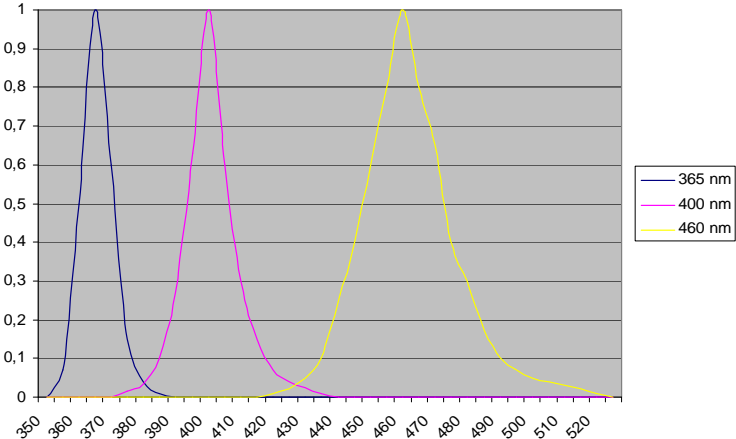


Fig. 3): Panacol UV LED flood lamps



Fig. 4): Panacol UV LED arrays

Fig. 5): Spectral distribution of the bluepoint LED



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