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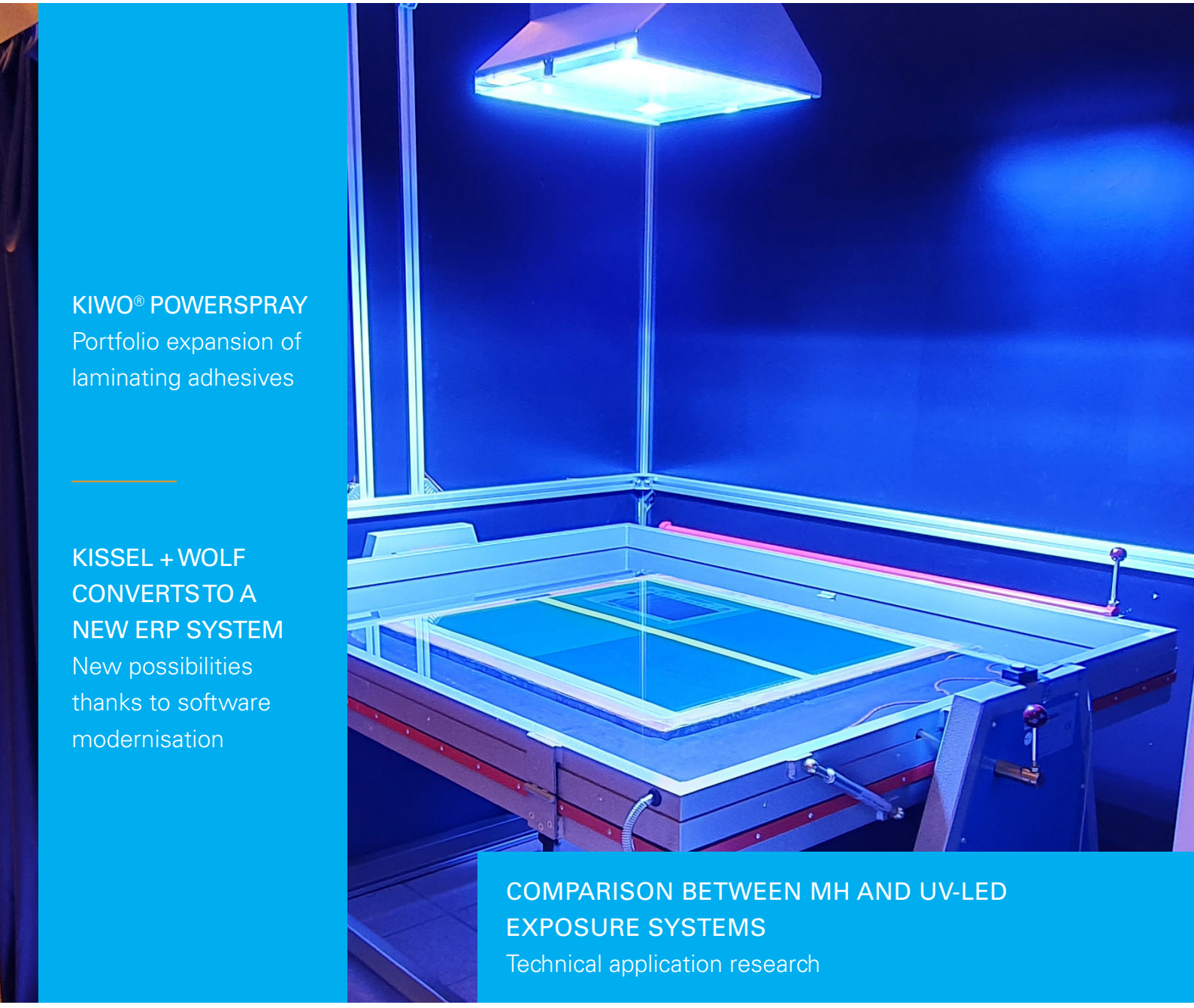
Newsletter



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Kissel + Wolf

COMPARISON BETWEEN MH AND UV-LED EXPOSURE SYSTEMS

No longer just confined to the private domestic sector, the whole topic centred on LED („light emitting diodes“) has now also emerged as an especially interesting technology in the field of industrial screen printing.

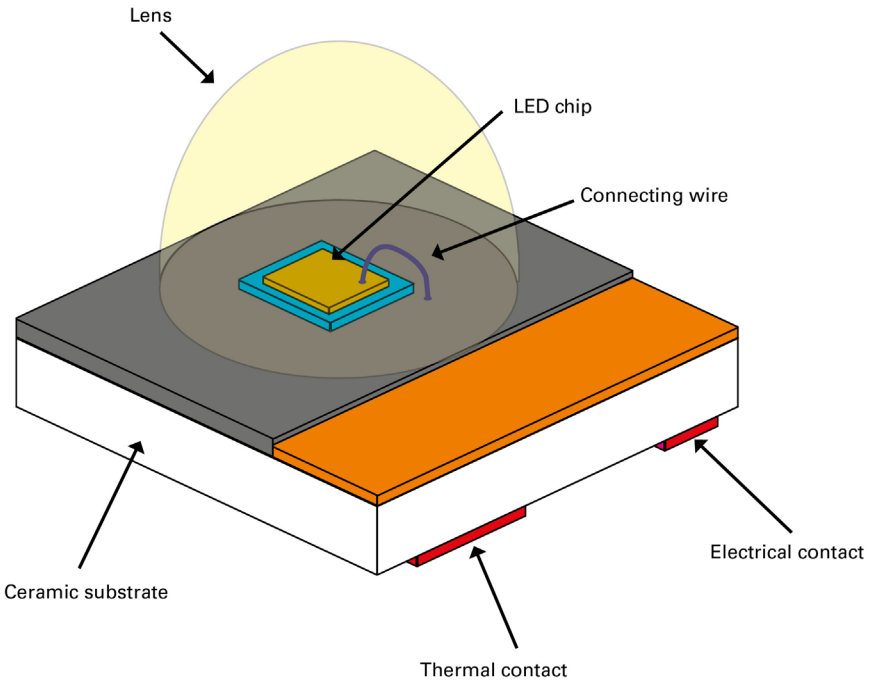


Fig 1: Structure of a light-emitting diode

This has led to more and more UV-LED exposure systems being installed and used for the exposure of screen-printing stencils. This paper highlights our own research concerning the respective fields of application for screen printing stencil production.

There are several types of UV-LED exposure for screen printing stencils: conventional and UV-LED exposure via a computer to screen (CTS) system.

In conventional UV-LED exposure, a distinction is made between an all-over illumination (LED rows) and moving UV-LED bars. These conventional UV-LED exposure systems are supplied in a compact closed construction with a vacuum table, which is already common for all MH (metal halide burner) systems. For UV-LED bar exposure systems, we recommend a very reactive SBQ emulsion (e.g. POLYTEX BETA, POLYCOL Z 542 CTS etc.), as the brief energy output over the surface to be exposed is relatively low. With each individual pass, this results in only achieving a pre-cross-linking of the top coating layers, whereby the in-depth curing to the squeegee side of the stencil becomes difficult.

In UV-LED CTS systems, a distinction is made between masking systems (wax or water-based imaging / inkjet imaging, followed by conventional UV-LED exposure) and systems with direct digital stencil exposure (CTS projection).

All of these LED lighting systems (LEDs 385-405 nm, power output conventional LED 10-15 W/LED), as well as conventional MH systems (1000 W - 6000 W and more) have their advantages and disadvantages, decided by the kinds of application and requirements for the individual stencil exposure process.

UV LED versus MH systems in conventional exposure

The conventional UV-LED area exposure systems (rows of UV LED distributed over the entire exposure area) have the advantage that correspondingly high energy is available due to the large number of LEDs and short distance to the stencil. Stencil resistance, especially for water-based print media, is comparable to conventional MH exposure in this UV-LED exposure system.

With regard to exposure quality, however, there is a significant difference: between the rows of UV-LED there is an overlap of the respective cones of light (energy potentiation), which can adversely affect resolution of the finest structures in the layout.

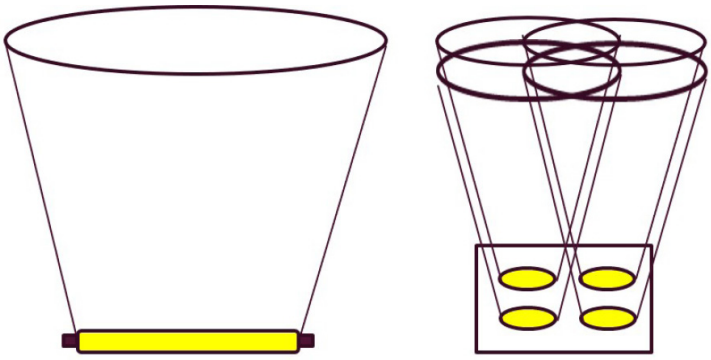


Fig 2: MH burner vs UV-LED

Due to the resulting light cone within the UV-LED rows, the imaging edge starts to blur and the finest details tend merge into each other. For many less demanding imaging applications and coarse layouts, this disadvantage is not quite so critical. But when it comes to difficult jobs, such as in technical screen printing and in the field of high-end electronics, then this is an important criterion.

In contrast, through their selective light source, MH lamp exposure systems emit a single / uniform beam of light, which in combination with a suitable reflector, the energy of which decreases somewhat at the edges of the exposure surface, but achieves a correspondingly good and homogeneous imaging result.

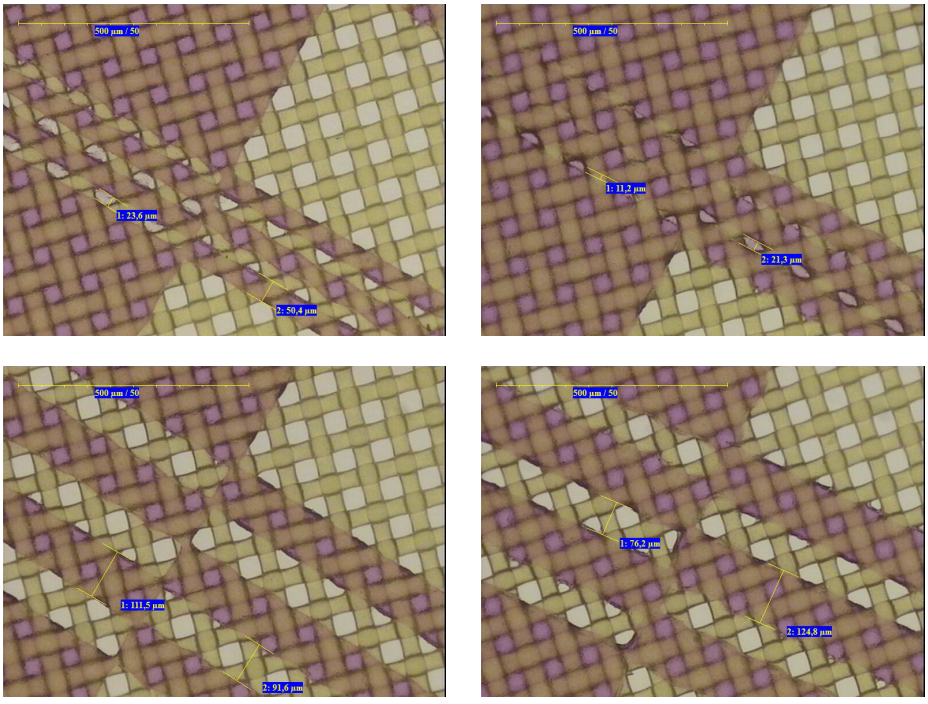
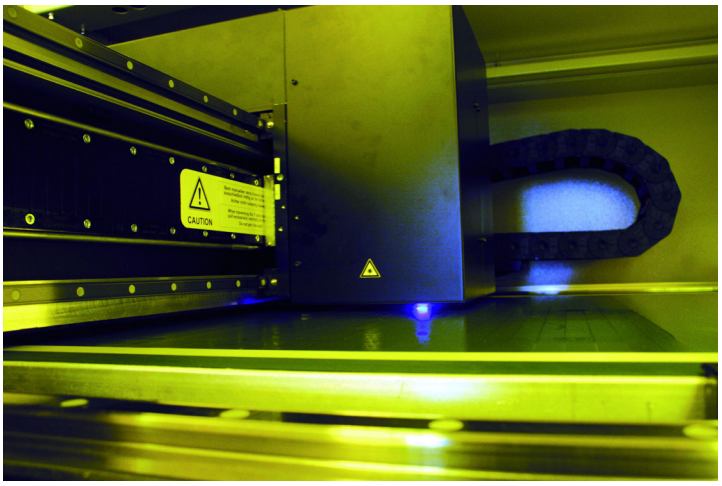


Fig 3: Coated with POLYCOL S 270 CTS Violet. Top: 40 µm exposed with a conventional MH system (left) vs a conventional UV-LED area exposure system (right). Bottom: 100 µm exposed with a conventional MH system (left) vs a conventional UV-LED area exposure system (right).

On this subject, in correlation with our photoemulsions, we maintain close support liaison with manufacturers of UV-LED exposure systems. The joint aim is to determine best possible optimisation and further development of UV-LED technology, which had not always been fully developed for screen printing stencil manufacture.

A major disadvantage of MH lamps in contrast to UV-LED systems is the relatively rapid aging of the arc burner. A MH lamp produces energy in the right wave-length through gallium (Ga) and iron (Fe) doping which rapidly degrades, following each consecutive ignition and cooling process. Moreover, some MH lamps, which are too old have been used for too long (over several years), and, even disproportionately extending the exposure time via a light metering device, cannot achieve optimum emulsion hardening. With up to 10,000 operating hours, UV-LEDs have a much longer life than MH systems.



UV-LED CTS exposure

In the meantime, UV-LED technology (with wave-lengths of 395 nm and 405 nm) has also established itself in „Computer to Screen“ systems for stencil production. As with conventional stencil imaging, the main advantage here is the longer life of the LEDs.

Because of DMD (Digital Micro-mirror Device) optics, the imaging result is comparable to an identical system using a MH burner. A disadvantage is that the power output is lower in direct comparison to MH lamps. Since the power output energy is also absorbed by the optics, this plays a major role in particular when a high rate of stencil production is required. The requirement for a relatively high head speed plays the major role, but high head speed also reduces the energy input to the area to be exposed. Therefore, only reactive SBQ photoemulsions with correspondingly high exposure reactivity, are suitable for this purpose (POLYCOL S 285 CTS Red, POLYCOL S-HR or POLYTEX BETA etc).

An exception is the so-called UV laser diode (405 nm), which must not be confused with a conventional UV-LED unit. These have much higher energy output (fibre-linked UV laser diodes -120 mW/ laser diode – module 16 – 128 laser diodes), with an even greater operational life (over 20,000 operating hours). Certain CTS systems in the market utilise this source of exposure, either controlled by DMD optics or by direct projection via a fibreglass cable and raster plate optics. With this laser technology, efficiently concentrated exposure energy enables complete hardening of all types of photoemulsions and at relatively high exposure head speeds.

Summary

Light source	Energy output	Exposure quality	Stencil resistance	Life span of light source
MH-Systems	●●●	●●●	●●●	●
UV-LED (full area illumination)	●●	○	●●●	●●●
UV-LED (bar illumination)	○	○	○	●●●
UV-LED CTS	●	●●●	●	●●●
UV Laser diode CTS	●●●	●●●	●●●	●●●

●●● =very good ●● =good ● = satisfactory ○ = Not optimum

UV-LED technology has arrived in the screenprinting stencil-making field. Customers should, however, consider the pros and cons for each individual application in order to make best use of exposure systems available for screen production.

Before deciding on the use of a UV-LED system or a conventional MH exposure system, this should be tested and evaluated with appropriate test stencils for that particular area of application. Only when all the evaluations have been done, can the right decision be made.

Our Screen Printing Application Centre is more than happy to help you and answer technical questions on the trending topic of UV LED exposure, when being used with our photoemulsions: info@kiwo.de.

Portfolio expansion of laminating adhesives

NEW: KIWO® POWERSPRAY

Today, we are delighted to introduce KIWO® PowerSpray, our new spray adhesive for contact bonding, which extends our MECOTHERM® range. This is designed for bonding a wide variety of materials such as plastics, metals, wood and wood fibre composites, leather, synthetic leather, textiles, spacer fabrics, polyether, polyester and polyurethane foam and much more.

In addition to excellent initial adhesion, this contact adhesive is also characterised with its high temperature resistance. Thanks to simple and practical processing direct from the spray can, KIWO® PowerSpray is particularly suitable for tradesmen, in saddlery, as well as for use in industrial fields.

Product benefits

- Easy to use thanks to practical spray can application
- Very good adhesive properties on different substrates
- High initial tack and temperature resistance
- Suitable for many applications

For further information or sample requests, please contact: adhesives@kiwo.de

New possibilities thanks to software modernisation

KISSEL + WOLF CONVERTS TO A NEW ERP SYSTEM

Dear Customers,

As you may have heard in conversations with your contacts at Kissel + Wolf, we are facing a major change in 2021: We will convert our Enterprise Resource System. With this step we are replacing an ERP software which we have been using for over 20 years. Even though the current system is still working reliably, we have realized over the past few years that there are numerous restrictions, specifically in the connection to other contemporary software products or the option of comprehensive data analysis.

A team of key users has been working on the configuration and adjustment of the new ERP system to our needs for around 1.5 years. We have now reached a point in the project where we are sure to be able to fix a final start date and to inform our customers.

The start of the new system is scheduled for July 14th, 2021. On July 12th and 13th, the technical changeover from our old to the new system takes place. Our office will be open, you can reach us during this time, however, we will be able to work only to a limited extent. New orders or changes to existing orders cannot be entered during these days.

From July 14th, 2021 your orders will be registered in the new system and the first deliveries will be processed with it. We are very well prepared for this day and do not expect any major difficulties. Nevertheless, we cannot rule out the possibility of teething problems. Due to the complexity of modern, integrated merchandise management systems, it will take a certain period of time until all processes run smoothly to their full extent. We therefore ask you to consider these dates when scheduling your orders with us. The last regular shipping day before the changeover will be July 9th, 2021. Orders that have not been dispatched by then will be processed with the new ERP software from July 14th, 2021.

Your usual contact persons will be happy to answer any questions you may have about the changeover.

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