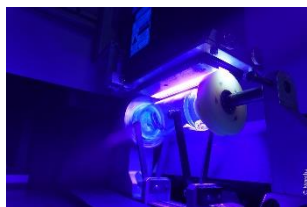


UV LED screen-printing technology with a focus on glass substrates

In recent years, screen printing has undergone a technological transition – from conventional UV to UV LED curing. Dual-cure screen printing inks make it easier for user organisations to manage this change, as they can be deployed both in traditional UV and in the newer UV LED printing systems. As a printing ink manufacturer with engineering industry partners, Marabu has extensive expertise in UV LED technology. This printing method offers a variety of benefits, especially for glass substrates.

Fresh impetus through UV LED curing technology



UV LED curing for screen printing has made great inroads. Printing-system engineers and ink manufacturers are increasingly making use of this pioneering technology. UV LED curing eliminates the need for a warm-up period, saving time. A further advantage is the greater printing speed, and therefore higher throughput, as there is no need for a standby mode when the printer is paused or when switching print jobs. Moreover, the UV LED lights have a far longer service life than conventional UV tube lights. The

greatest benefit is, however, the wavelength of the light. LED units operate in the UV A band, so no ozone is emitted. An air extraction system for the production area is therefore not required. Together, these factors lead to markedly lower electricity consumption and significantly reduced costs. As a result, there is rapid payback of the initial capital outlay. Overall, LED technology leads to more sustainable business operations and is an attractive alternative to conventional UV-curable printing.

Increasing number of UV LED curing inks on the market



To make full use of the strengths of UV LED curing, inks must be formulated to match its attributes. Marabu, the ink manufacturer headquartered in south-western Germany, has made a name for itself in this field. The Marabu portfolio comprises premium-quality ink ranges, in particular for glass substrates. Pascal Iffland, Key Account Manager for Packaging, explains: "UV LED-curable inks, such as Marabu's Ultra Glass LEDGL line, contain photoinitiators. These absorb light in the UV A band, and ensure complete curing at the speed required for the corresponding print jobs." In the printing industry, wavelengths of between 385nm and 395nm have proven to be ideal, and Marabu's inks were

developed accordingly. Moreover, UV and UV LED-curable screen printing inks do not, in contrast to ceramic thermoplastic inks, have to be heated within the screen. The use of polyester fabric, and the smaller-sized particles of the ink's raw materials, allow the printing of extremely fine details. As a result, both large images and precise details can be created. UV LED curable inks produce an abrasion-resistant film that adheres firmly to the substrate. They do not require a further coating, unless this is to deliberately produce a particular look and feel. And compared with the ceramic thermoplastic baking inks, UV LED curables do not require oven drying, and so consume far less energy. Industry experts consider a 56% reduction possible. Additionally, there is no need for the oven itself within the production area, saving space.

UV LED curable printing is taking the world of glass decoration by storm



The UV LED process has been successfully employed to decorate plastics for many years. Beginning some five years ago, the process has been applied to glass. Glass containers for personal care items must avoid contaminating their contents in any way. For the decoration of cylindrical containers, such as drinking glasses, the priority is dishwasher safeness. UV LED screen printing complies with both requirements, and offers further strengths. Inks printed directly onto glass items, such as bottles for beverages, have greater colour fastness and brilliance, communicating enhanced quality and achieving competitive advantage over conventional labels.

Marabu's premium ink range for screen printing of glass decorations with UV LED curing



In association with glass manufacturers, Marabu fine-tunes ink formulations in line with specific use cases. The makers of printing systems, too, consider how to best create decorations on certain shapes and materials. These collaborative activities led to Ultra Glass LEDGL. This UV LED-curable screen-printing ink combines excellent initial adhesion with superb opacity, sheen and reactivity. The product line includes brilliant, glossy colours and high-opacity tones for dark substrates. Marabu offers its customers the broadest choice of high-opacity ink colours on the market. With appropriate printing systems, it is also possible to perform pinning:

this is a form of curing to allow the 360-degree decoration of cylindrical items, such as tubes and bottles. Depending on the exact scenario, the substrate may require pre-treatment. Ultra Glass LEDGL is a two-component system that requires the admixture of an adhesion promoter (bonding agent) for effective use. It also permits flexibility with regard to the chosen printing method, as LEDGL is a dual-cure screen ink. Following its successful deployment by customers and in response to growing demand, Marabu is extending the range of LEDGL colours available. The company is soon to launch a bronze binder for special metallic colours. Furthermore, Marabu is cooperating with an engineering partner to test a primer suitable for UV LED curing. This would allow the subsequent decoration of glass substrates with hot-stamp foil. Equipment capable of this production method is already established in the marketplace.



Further applications thanks to tailored ink formulations

UV LED-curable screen printing has been employed successfully to decorate plastics for many years. It has primarily been used for personal care items, e.g. tubes and bottles that must meet stringent requirements. Recently, a further use case has gained attention, namely metal. Inks for glass offer extremely good adhesion for this substrate, as well. As a result, UV LED-curable screen-printing systems are already being deployed to directly print metal packaging. Pascal Iffland is confident: "This technology is certain to be rapidly adopted in other fields of application where it can play to its strengths."

Marabu GmbH & Co. KG



Marabu is a leading global manufacturer of liquid coatings and screen, digital as well as pad printing inks with headquarters near Stuttgart, Germany. Marabu's track record of innovation stretches back to 1859, featuring many industry-first solutions for both industrial applications and graphic design. With its 16 subsidiaries and exclusive distribution partners, Marabu offers high-quality products and customer-specific services in more than 90 countries. Exceptional technical support, hands-on customer training, and environmental protection are core elements of its corporate philosophy. Sustainable business practices are also key to Marabu's vision. These have been implemented through a number of initiatives, with concrete results. Marabu will continue to pursue these activities with commitment in the future and is certified according to ISO 9001 and ISO 14001.