In pad printing, it is increasingly important to produce goods of high quality and process stability “just in time”. Advantages and chances of UV inks are unambiguous and allow the user a high flexibility as well as competitiveness.

The origin of pad printing leads back to the printing of faces within the clock and watch industry. Other industrial applications as known today have been started in the early 70’s and perfected since then.

The technology is based on an indirect gravure printing process where the motif is put in the print form (cliché) in a deepened position for then being flooded with ink. After squeezing, the ink is taken up from the pots by a printing pad made of silicone rubber and transferred to the substrate. The ink transfer is due to a change in the adhesive behaviour of the ink which results from the evaporation of solvents.

There is no other printing process able to realize the decoration and marking of three-dimensional goods - no matter whether concave, convex or having a structured surface - with such an excellent definition and great versatility in colours and effects = a unique selling point in pad printing.

Strength of pad printing
- printing of 3D-parts
- realization of finest details
- extremely versatile colour range as well as special effects
- high opacity
- excellent mechanical and chemical resistances
- little space required as easy integration in production lines
- great variety of substrates

For printing processes such as screen, offset, flexo or gravure printing, UV inks have proven to be reliable for many years already.

What about pad printing?
Is it possible to transfer the experiences and advantages of other printing processes to pad printing, too?
To answer this, it is important to have a closer look at the differences between solvent-based and UV inks.

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<th>Solvent-based inks</th>
<th>UV inks</th>
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<tr>
<td>additives</td>
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<td>pigments/fillers</td>
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In the case of a solvent-based ink, a resin or a combination of resins is dissolved in a solvent. The result of this process is a printable binder which is the basis for a printing ink and defines adhesion as well as resistance.

A UV ink mostly consists of highly viscous prepolymers and achieves a press-ready adjustment by adding monomers. Due to UV irradiation, the prepolymers and the monomers are chemically cross-linked. This reaction actually originates the typical ink and its quality. The cured ink layer is, therefore, a newly developed, chemically cross-linked resin film.

The essential difference to UV screen printing inks is that UV pad inks usually contain a reduced percentage of solvents necessary for the ink transfer.

Compared to traditional inks, UV inks display a high stability in viscosity during the printing process. This is why the colour shade remains almost constant what leads to a reduced labour input and an increased time-saving. The prompt drying via UV light gives the additional possibility to post-process the printed parts immediately.

Industrial users have soon recognized that using UV curable inks does not only save time but also offers a higher quality and process stability.

Advantages of UV pad printing inks
- increased chemical resistance compared to 1-component solvent-based inks
- significantly better chemical resistance than solvent-based inks mixed with hardener
- higher gloss compared to solvent-based inks
- great variety in substrates

Which UV-dryer?
Well-priced “stand-alone” UV dryers with a power of 80-120 W/cm can already be used for the UV pad printing technology. Depending on the kind of application, e.g. if different parts require a UV-dryer adjustable in height or if the drying must be carried out “in-line”, the dryers can be conceived accordingly.

Tampacure TPC

The high-glossy Tampacure TPC covers a wide range of substrates and enables a cost-saving storage. Besides a comprehensive range of basic shades, high-opaque colour shades, as well as transparent 4-colour process shades, Tampacure TPC offers everything what a modern UV pad printing ink must have, together with an excellent chemical and mechanical resistance.

Abb. 1: Electronic component, a typical UV application

Abb. 2: Applications with UV pad printing inks
Pad Printing with UV-Inks – an Investment in the Future
Gianni Robertazzi, Product Manager at Marabu, explains in the following article the possible fields of use for UV pad printing inks.

Summary
In conclusion it is to say that pad printing with UV inks not only plays a particular role for the high-quality printing of end products which must be post-processed immediately, but it is increasingly gaining in importance. The low content of solvents common to UV pad printing inks not only allows for an increased environmental consciousness but safeguards at the same time a process-safe production run as well as high-quality and reproducible print results.

The crucial question if this investment is actually profitable can easily be answered seen the long-term advantages: A fast implementation of print jobs, immediate post-processing and therefore reduced drying times and storage costs clearly stand for an investment in the future.

So the question is not if but when you want to start working with UV inks in pad printing.

We are pleased to assist you at any time!

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