SIEGWERK

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Which inkjet technology has the greatest potential in packaging printing?

Digital printing is advancing as it addresses the growing short run demand driven by brand owners looking for regionalization and personalization of their packaging. Markus Klügge, Sales & Technology Manager BU Inkjet at Siegwerk, about the most promising inkjet technologies for packaging printing and the company's own digital printing activities.



Q: In which inkjet technology do you see the most opportunity?

A: From our perspective, the most promising technologies are UV and water-based inkjet, the two areas where we already focus our activities today. UV inkjet fits with narrow web printing on relatively thick material such as labels & direct-to-shape. Water-based inkjet is the most promising technology introduced for single pass large width printing on flexible packaging and corrugated applications. We don't believe in "one fits all" solutions as packaging and label

markets include diverse sub-segments each one requiring different ink characteristics. Therefore, we offer customized ink solutions to the users' needs – this means for the final application and not only for a given printing equipment. For us customization goes beyond classical color matching, it also covers optimization of adhesion, mechanical and chemical resistance as well as assessment of migration risk.

Q: You say, choosing the right inkjet technology depends on the final application purpose of the packaging. So, what are important characteristics of UV inkjet inks when printing packaging?

A: First of all, both technologies – UV and water-based inkjet – exist for very good reasons. At Siegwerk, we divide the market into narrow and wide printing widths. For narrow web single pass applications we believe in UV inkjet inks as they offer clear benefits: They cure fast and thus can be processed immediately. They are scratch- and abrasion-resistant and create high-gloss prints ideal for example for label application. UV inks include photoinitiators that ensure ink curing but also imply higher migration risks when it comes to food applications. That is when low-migration comes into the game. So, the most important prerequisite for using low migration UV inks is that final application and processing really work with the use of the UV curing technology.

Q: What does this mean concretely?

A: The question here is, could it for example come to a set-off migration or is the barrier effect of the printed packaging material safe enough. When talking about glass packaging, the barrier effect is high enough but in regard to plastic containers this is not necessarily the case. You see it depends on things like wall thickness, potential barrier layers and material properties if UV inks are a suitable choice for printing packaging. Another aspect is the kind of UV curing. The more molecules react during the curing process, the less can migrate. It depends on the used radiation energy as well as the exact match of ink and radiation source.

Energy-saving LED lamps for example emit only one wavelength and not a whole spectrum like conventional metal halide lamps. However, it's important that the UV radiation really penetrates the whole ink what could be difficult when using highly absorbent substrates like corrugated board. In this case it might happen that the entire ink soaks so that the UV radiation can't reach it anymore.

Q: And when do come water-based inkjet inks into play?

A: When looking at corrugated board as an example for absorbent materials with porous surfaces it is a clear application area for water-based and not UV inks. Very thin films are also critical for the use of UV inks as they have a low barrier effect. Besides, with UV technology the ink layer is often as thick as the film itself. This is absolutely undesirable as it could lead to marginal so-called curling effects at the film web.

Q: Are there any limits for the inkjet technology when it comes to certain substrates?

A: By classical understanding, it is generally hard to use the inkjet technology for highly absorbent as well as non-absorbent substrates – especially when talking about water-based inkjet inks. In the one case, the ink drop over-spreads leading to a blurred print, and in the other case, the ink gets soaked in so strongly that no color stays on the surface. Therefore, a pretreatment with primer or corona is key when using inkjet technology for this kind of substrates. For water-based inks you particularly need to consider the crucial interaction between primer and drying to make it work. On the one hand, the inks should dry quickly on the substrate, but on the other hand, should also not already dry on the printing head – a technical challenge. Therefore, using primers is no evil, it rather guarantees flexibility and productivity. Drying without primer, no matter if using hot air or infrared radiation, would definitely limit the choice of substrates as well as the printing speed. Primer could also help to balance potential varying quality of the printing substrate.

Q: Where does Siegwerk's inkjet business stand today?

A: Since our move into the inkjet ink area a few years ago, we are today offering analog inks to printers and inkjet inks to equipment manufacturers both for packaging and label applications. We have continuously invested in the expansion of the digital printing segment and created a solid base for significant commercial success. Over the last 3 years we have invested several million euros to specially build up our development, production and testing capabilities in inkjet technology. After inaugurating a dedicated inkjet laboratory in 2016, we introduced our first designated inkjet ink production facility in 2017. Going forward, we will continue to invest significantly in new equipment transforming our site in Annemasse (France) to the driving force for our future inkjet ink solutions. With this year's acquisition of AGFA's UV inkjet ink business for labels and packaging we further extended our global reach in this young market segment.

Q: Which inkjet ink solutions is Siegwerk offering so far?

A: Our inkjet offering today focusses on UV technology - covering conventional UV to full LED curing. With Sicura NutriJet we for example provide inkjet ink series for sensitive food and pharma packaging that works with different inkjet printing head technologies. With Sicura Jet low-odor we also offer the only non-CMR UV inkjet inks that are designed for printing labels for household, hygiene and industrial packaging. Our inkjet inks are suitable for a wide range of label applications like for example self-adhesive labels for cosmetics, wet-glue labels for food and beverages, direct printing on 3D-packaging objects, blister packaging as well as aluminum lids for food products. For packaging applications like flexible packaging, tissue or corrugated board, we are currently working on water-based inkjet inks that will follow at a later stage.

Q: What are your future expectations for the inkjet market?

A: Going forward, inkjet inks for labels will gain strong traction while inkjet inks for packaging will further progress. We strongly believe that UV inkjet will become a mainstream printing technology for label applications. We also expect some long-term opportunities for UV inkjet especially in the direct-to-pack printing market where we are still in an early stage of the adoption curve. Water-based inkjet inks are naturally offering great opportunities for corrugated printing applications. We expect this technology to also become the technology of choice for digital printing of flexible packaging. Even if there are some significant technology barriers that still need to be overcome, we expect first developments of water-based inkjet inks for flexible packaging to be announced around Drupa and Interpack in 2020.

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