Hot right now

From interdeck pinning to drying full-colour digitally printed sheets, there's a technology out there to suit your application.

Given the work that is going into advancing inks and toners (see page 42), it is no surprise to find out that those involved in drying and curing such chemistries and solutions are likewise investing heavily into the future of their technologies.

An example put forward by Phoseon is the expansion of low migration inks, with the popularity of low migration UV LED curable inks driving the need to develop and introduce technologies that can deliver benefits such as enhanced food-safety and a more stable print process with greater control in crosslinking inks, coatings and adhesives. The rise of UV LED further facilitates continued expansion of the substrate range. More specifically, UV LED technology allows users to cure a variety of heat-sensitive substrates that have previously been unusable with traditional UV arc lamps.

This, in turn, necessitates deep and meaningful collaboration across the supply chain to deliver functional and appropriate technologies.

Stacy Hoge, marketing communications manager at Phoseon, explains, 'We have a systems approach that requires collaboration from the ink company, OEM and LED curing lamp supplier. We make sure that we stay involved with all the latest technology. All major ink suppliers have our lamps in their labs so most of the testing of inks and materials are done with Phoseon products. Phoseon also is involved with raw material suppliers to the ink industry as they further develop supporting components for LED inks, coatings and adhesives.'

PCT develops electron beam curing systems for a number of industrial applications

Karl Swanson, president at PCT Ebeam and Integration, states, 'An electron beam (EB) system is merely an awesome paperweight without the associated printing press, coating line, inks, coatings and substrates. Therefore, PCT works hard to cultivate long-term partnerships with key co-suppliers.'

Dr Kai Bär, managing director and president at adphos Digital Printing, affirms that drying and pre-post ink/coating processing must be seen in conjunction with ink coating application technology, ink recipes, substrates, and pre- and post-processes.

'Therefore close work – or even a network/partnership with the different parties – is mandatory for application, customer, market adapted drying solutions.'

adphos is active in a global network/partnership with most key players within the supply chain as part of its work to develop the next generation of NIR technology.

Its aNIR systems – advanced NIR – incite any polar molecule, such as water, alcohol or solvents, by mobilising them with high-energy density NIR light. The molecules start moving and evaporating. Whilst polar molecules absorb high percentages of NIR light, substrates absorb very little NIR energy. Transparent plastic films, for example, take around 1%, white paper less than 5%. This means the substrate stays cool whilst the ink evaporates.

Advancing technology

Alongside the benefits such performance brings, Dr Bär notes print quality enhancements, improved productivity, reduced energy costs, and production/process savings as furthering the need to develop aNIR technologies.

Another driver identified by Phoseon is that of digital/flexo integration in set-ups that leverage the benefits of both technologies (read more about hybrid printing on page 34). By combining two production tools in virtually the same footprint, it is ideal to have associated technologies installed on the press that easily support both processes, offering one technology for the whole print flow.

More generally, higher press speeds and wider widths feature highly in the development of drying and curing systems. 'Due to increased press

speeds, more power is required from the UV curing light source, as having enough power is crucial to the curing process,' explains Ms Hoge. 'This is where peak irradiance and energy density (dose) come in to play. A minimum threshold of irradiance is needed to start the polymerisation process, and then a dwell time of dose is needed to finish the curing process. Both high irradiance and energy density are required for a successful cure.'

Mr Swanson notes that PCT continues to optimise the design of its systems to align with new developments. 'For example,' he says, 'the width of our Core 100 model precisely matches the web width of the HP Indigo 20000 and 25K presses. By tailoring the specifications of our machines, we can reduce the price and thus broaden our potential market.'

Core 100 is one of PCT's latest developments, and is a compact system suited for either inline curing of inkjet inks or offline curing of overprint varnishes (OPVs). A maximum production speed of 183m/min at a width of 760mm allows the system to match and even exceed the press' capability, and allowing instant curing and converting of digitally printed flexible packaging.

adphos has introduced an aNIR-based system for inkjet applications running water-based inks and allowing the processing of thermally

The popularity of low migration UV LED curable inks is driving the need to develop and introduce new technologies

sensitive flexible packaging films.

Phoseon offers both air-cooled and water-cooled UV LED curing options, from small compact pinning to high powerful systems for full cure. Specifically, FireJet FJ240 and FireLine FL440, air- and water-cooled options respectively, are systems suited for single-pass inkjet applications.

Single-pass inkjet printing is a process being advanced for a number of applications, not least packaging in its many forms.. From sheet-fed corrugated to web-fed flexible packaging presses, the evolution of inkjet keeps progressing.

This is one area where Mr Swanson sees opportunities for EB in the future. Whilst the coronavirus pandemic has slowed the rate at which developments have been made to leverage EB technologies, he is confident of the technology's future, especially in digitally printed packaging. 'The use of EB cured coatings as a method of producing recyclable and compostable flexible packaging is now well proven and ready to expand. Second, inkjet printing with EB curing is a combination that has much to offer for flexible food packaging. The third promising application involves the use of inkjet heads to apply a clear coating. This allows for digital embellishment while retaining the benefits of EB including food-safe, solvent-free coatings.' •