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Today's solutions for tomorrow's demands

SEBASTIAN REISIG

Comexi Group welcomed more than 200 visitors to an Open-house event, held from June 1-3 at their headquarters in Riudellots de la Selva, close to Girona/E. Since the event was organised together with Sun Chemical and ESI, its focus was clearly on promoting the Electron-Beam (EB) technology, alongside a new flexographic press based on the FlexoEfficiency concept.

More environmentally friendly? No EB-White commercially available? Gravure-like quality? Too high ink layer thickness? A lot of rumours exist about EB technology. This Open-house was held to inform and update the packaging printing industry about this technology.

EB has been in use in the offset industry for decades. For some years Comexi has tried to establish this technology in the flexible packaging printing market (see FLEXO & GRAVURE INT'L 3-2006, p. 66; 2-2007, p. 6; 3-2007, p. 46). Although the hype about EB eased off in the past couple of years, the press manufacturer confirmed its strong commitment to this technology by launching the FW 1508 EB series.

Demo job under production conditions

The CI flexo press can reach a top speed of 300 m/min (984 fpm) and print a maximum width of 1270 mm (50"). It is known that a Comexi machine, especially the eight-colour press prints very precisely, with a register accuracy of +/- 20 micron.

To demonstrate the performance of the press – and of course the EB technology – a realistic six-colour job was printed on a white BOPP film from Poligal. 20,000 metres were printed at a speed of 250 m/min (635 fpm) using DuPont Cyrel DFQ plates with a 60 l/cm screen (152 lpi).

The demo press has already been sold to a South European printer, more are set to follow. Comexi plans to install an EB press at their headquarters to offer customers the possibility of printing test jobs.

A specially designed chamber system comes with three blades, double entry and central exit, optimised flow chambers and magnetic blade position (no tools required).

What is EB and how does it work?

Electron Beam (EB) curing means the use of electrons to crosslink, at the molecular level, a combination of monomers, oligomers and other chemical compounds, forming a non-tacky, hard and cross-linked film. This means that it is possible to print »wet on wet«.

In EB curing, a curtain of accelerated electrons is emitted towards the web in an evacuated chamber. When the energised electrons hit an ink or coating, the curing process happens instantaneously without the need for a photoinitiator. This effectively instantaneous cure gives the printer the ability to post-process inline or ship immediately as the substrate comes off the press. This ability to respond quickly and to not have a lag time and inventory problems are additional financial and process management benefits. EB inks do not have the disadvantage of requiring any photoinitiator such as those needed in UV printing which also requires several degrees of post-curing. The process is performed in inert nitrogen conditions.

A wide range of substrates can be printed, usually with inline corona treatment to aid adhesion and laydown of ink. Typically, PET, PP and treated PE films give good results, but not every film is suitable and should therefore be checked before use. Some films fail for reasons other than poor adhesion, for example discoloration or odour when exposed to EB.

Selecting the best substrate, especially for food packaging, is important in meeting end-use specifications. Also some films can be affected by irradiation and their melt index can be raised slightly. At the doses used for curing, most films are not affected to the extent that they become unusable and sealing strength is maintained. However, it is essential to check if the film to be used can resist EB.

Sun Chemical offers several EB white ink solutions for reverse printing. For surface printing they offer UV/EB whites, containing a low share of photoinitiators, conform for food packaging. This commercial successfully used solution is offered since printing white as first colour wet-on-wet is not possible due to its different formulation and layer thickness.

Efficient and versatile

Comexi also presented an entirely new printing press. As a mid-web press, the F4 is fully adapted to short runs below 10,000 sqm (107,640 sqft). The company rate it as a ver-

Left:
Comexi's FW 1508 EB series.

Right:
The new F4 FlexoEfficiency press.



satellite solution for a variety of markets, such as short-run flexible packaging, shrink sleeves, wrap-around labels, and in-mould labels, but basically for the food market due to its print repeat length.

A new printing deck and a new drying tunnel were developed. The *F4* is available with eight colour decks for a 720 mm (28.3") or 920 mm (36.2") material width and a maximum repeat length of 600 mm (23.6"). Top speed is 300 m/min (984.2 fpm). Un- and re-winder are both shaftless single types, duplex shafted is optional. The new ink deck offers new bearing positions and a new linear guide position.

The *F4 FlexoEfficiency* system has been designed with comfort in mind; ease of use and maintenance. Easy access to the doctor blade, easy web threading, easy cleaning of the interstation driers, easy cleaning of the central drum and a vast array of ergonomic enhancements. The press can be adapted to print with conventional solvent- or water-based inks and UV inks for the label sector and with the *eComeri* technology for EB flexo printing.

The use of the optional *Cingular* technology module will allow a fully automatic adjustment of pressure and register just by determining the centre of each micro-dot with a simple mouse-click. After that, setting is done fully automatically.

The demo job was printed on a 12 micron PET with engraved *Ligum* EPDM sleeves (print repeat of 450 mm/17.7") on *Comeri's* carrier sleeves. The engravings with a 54 l/cm (137 lpi) screen were made by *DeSchutter Neroc*, solvent-based inks again were provided by *Sun Chemical*.

UV Curing	EB Curing
- Use of photoinitiators	+ No use of photoinitiators
- Costs	+ Comparable integral costs as solvent-based inks
- Food compliant ink series costly	+ Food compliant inks by nature
- Face restricted level of acceptance with brand-owners	+ No food scandal yet
- Several degrees of curing are seen	+ Fully cured
- No autocleaning possible (time and cost) due to press construction	+ Autocleaning possible (time and cost) due to CI construction
- Washup with solvents	+ Washup with water
- Very high viscosity (500-1000 mPas)	+ Viscosity like solvent-based inks (120-280 mPas)
- Sensitive to sunlight	+ Insensitive to sunlight
- Cooling system required	+ No cooling system necessary
+ Accepted and proven technology	- Still a »new« technology
+ Lower investment costs	- Higher initial investment costs
	- Requires inert curing environment (costs for Nitrogen)
	+ Much lower energy consumption (2-3 times less)

Pros and cons of UV and EB curing.

Converting

Proslit, Comeri Group's slitting and rewinding equipment brand showcased the established *Compack2* and the new *E-Turret*.

Compack2 is available for maximum web widths of 850/1350/1650 mm (33.5/53.1/65") and a top speed of 500 m/min (1640 fpm). Maximum unwind diameter is 1000 mm (39.4"), maximum rewind diameter is 610 mm (23.9").

The new *E-Turret* is available for 1350 mm (53") and 1650 mm web widths (65"). Maximum unwind diameter is 1000 mm (39.4"), maximum rewind diameter is 610 mm (24"), maximum machine speed is 500 m/min (1640 fpm). The complete machine is easily operated through a touch panel control. Its run lengths can be controlled by the mother reel diameter, linear meters or final reel diameter. Its memory can store a high number of job parameters.

Summary

Comeri's self-confident appearance shows how convinced they are of »their« EB technology and its chance on a bright future.

This technology still has its problems and disadvantages. But the company emphasised EB's advantages and eliminated a few prejudices during the presentations and demos, held to this topic.

The new *F4* press taps the pulse of the time by following the trend to evermore narrower and simplified presses for smaller jobs. It provides state-of-the-art technology for low cost per square meter, and high productivity printing. In addition to its lower maintenance costs, it is the most efficient solution for short runs.

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 → www.sunchemical.com
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