Digital Technology – Adding Value to the Converting Process

The move to digital in today's world has become unstoppable and inescapable. We've all seen the statistics – Out of the world's estimated 7 billion people, 6 billion have access to mobile phones and by end 2011, 2.3 billion people (i.e. one in three) were using the Internet.[1]

Today's phone is now a watch, camera, disc player, radio, torch, GPS, and calendar (to name but a few) – all in one! Digital technology means we have access to music on our iPods, or mobile-phones – but we can now listen to whatever music we choose, in whatever order we choose, wherever we are, whenever we like – even when we're swimming, running, overseas or on a bus, plane or train. Remember, not so long ago, we had to listen to what was chosen for us and sold in the shops, on our static record or disc player, at home in the room we kept it! The entire supply chain has been disrupted.

Digital technology has meant its inevitable encroachment into the print and packaging industry is also upon us. When we look at the end-to-end processes, prepress is now almost completely 100% digital. The uptake of digital printing may be far less – but it's growing at a rapid 12% year over year. By 2018 digital printing will equal 50% of the global offset sector, higher in the more mature print regions[2]. It's only the post-press section which has remained analog, retaining the need for highly skilled employees, high expenses, and a time-consuming, complex supply chain. But that is about to change.

Market segmentation

Complementing the digital era is the advent of a wave of change in the way we buy things. Broadcast messages are proving to be less effective than targeted, customized messaging. This is shown in the "suggestions" we get when we search on the Internet, when we visit social media sites, when we stop at our corner store for a magazine or when we pick up a box from the shelf. We are now tempted by hundreds of variations of everything and look for the one that most fits our own self-perception.

The means to achieve this segmented, mass customized approach is short runs – of print, packages, deliveries, everything along the chain.

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[1] ITU report, Measuring the Information Society 2012.
[2] The Future of Offset vs Digital Printing to 2018 Smithers PIRA, 29th April, 2013

As we've just seen in the latest Coca-Cola advertising campaign – not only do we need our drink with labeling in our own language, but each country had labels with their own most common names. Market segmentation now, whether by region, language, season, age or gender requires ever shorter runs but at an even more demanding pace. Time to market becomes critical if your segmentation is seasonal for example. The product lifetime of packaging is shortening all the time. Kellogg's alone – a long-run brand owner if ever there were one – is reputed to be changing the graphics on its packaging every 12 weeks.

Responsiveness

Frequent – and often rapid – changes like these mean that converters are having to fight harder and harder satisfy and retain their brand owner clients and put up with their increasing demands for time to market, alongside last minute marketing driven changes.

The primary bottleneck in the packaging finishing process is the creasing and cutting because of the need for a die – this slows the whole process down. Window patching, cold foil, and folding and gluing can all be done in-house by the converter, but they lose control when they send out for the die. The price of the die, the timing of delivery, the transportation all depend on an outside supplier. And if you should need any changes to the die – which is frequently the case – you have to go through the whole cycle again. And once it's all completed, the setup time on the die cutting machine, not to mention the storage in vast warehouses, is both expensive and not very friendly to the environment.

Relief for squeezed converters

The answer is a digital solution which performs in-house, independent of an external supply chain, matches the quality of the analogue process, but will be faster, cleaner, greener, smarter, and more profitable.

The Highcon Euclid

The Highcon™ Euclid digital cutting and creasing machine was designed to solve just these issues. The Euclid was conceived out of an understanding of the need for digital technology for folding carton converting.

The first revolution incorporated into this machine is the separation of two processes of cutting and creasing. The conventional die covers both processes in one. But the different parts of the processes have different needs. In general the creasing does not have to change that often, but the cutting can and should. The limitations that caused them to be implemented together on the die are removed with digital technology, allowing each to shine in their own way.

By separating the processes, Highcon technology enables converters to offer the flexibility, creativity and responsiveness their brand owner clients are so strenuously demanding, while at the same time encouraging the brand owners to develop new packaging and marketing concepts.

Not only are they able to produce more creative designs, but they can also fine tune them by proofing without wasting time or money or materials. So how does it work?

Creasing

The creasing is carried out by the Highcon patent-pending Digital Adhesive Rule Technology, DART. This is an application of proven existing technology to a new process. The creasing data comes from the DXF file uploaded to the Euclid. Before starting the production the DART has to be written. The proprietary software translates the digital data and sends it to the special DART canister which releases the polymer onto a Highcon DART foil in the form of rules that once cured, will produce hard raised lines.

Cutting

The cutting is done by an array of high powered CO_2 lasers combined with scanners and advanced optics which perform the cutting design laid out in the software.

The process

In a production run, folding carton sheets of 0.3 to 0.6 up to a size of 706 x 1060 pass from the feeder along the conveyor to the DART station. Underneath the DART upper drum on which the foil has been wrapped and written, is a second drum, covered with a blanket-like counter. As the sheets pass through between the two drums, the crease is made.

Each sheet then passes automatically on, along the conveyor to the cutting station where a specially designed needle bed assists in the reduction of burnmarks as the lasers cut. The sheets then continue to the stacker to be collected.

Flexibility

But bear in mind that this digital process allows far more flexibility in editing, changing or correcting files.

Even before the crease lines are written on the DART foil the file can be proofed by performing partial cutting, or perforations to simulate the crease.

And once the crease lines have been finalized, the cutting parameters can be changed as we want, per sheet, to effect corrections, versions, or just last minute design changes. We can use the laser to produce marking effects, variable cutouts, perforations (like zipper tears) and numerous other effects. The fact that last minute digital changes are

possible means the operator of the machine can adapt the file to suit the correct cutting level for the specific board – impossible with conventional technology. This ability to control the depth of the marking or etching opens up a variety of new ways to customize packaging at the finishing stage rather than during the printing.

For example, partial cutting (scoring) is notoriously difficult and time-consuming to achieve, in fact we can double the make ready time of a standard layout just by having a simple half cut in there on a traditional die cutting process. Dual sided, folded blister cards are a good example of this with a half cut down the complete center panel, here a make ready on a 10 up blister card can go from 60mins to 120mins just because of the precise patching up required to level these half cuts. With a digital process we simply "dial in" the depth that we want, in fact all we do is run 1 sheet check it and adjust with the click of a mouse. Usually within 5 sheets the process is done and all cartons or blister cards have precisely the correct depth of cutting.

Adding value

In fact, the digitization of this stage of the process requires us to come up with a new name for the process. The term "finishing" demonstrates that this has traditionally been considered a necessary part of the process required to complete the job – but has not provided added value. By using digital technology we have put the value back into the converting of the cartonboard into attractive, differentiated, effective packaging.