

CODING AND MARKING

REPORT

PRINT-APPLY

Linerless labels offer materials savings

Linerless label technology has been around for a few years, but up to now has not made a notable impact on traditional die-cut pressure sensitive paper and film labels using siliconised backing paper.

In the past, the theoretical savings on liner and die-cutting as an additional converting process were offset by the particular combination of adhesive and thermally receptive qualities required in the linerless substrate used. The technology for unwinding, handling and cutting the reel also had to be more complex, and therefore was more expensive.



But are these unfavourable assumptions about cost set to change?

Martek Industries has just bolstered its Delta range of print-apply systems with the Freeline, produced by Irplast in Italy. Irplast is better-known as a plastics supplier, but it has developed the Freeline in order to open up – it hopes – a new and potentially massive market for its polypropylene films. In this case, the material used is PMR, which Irplast describes as a 60 micron BOPP material specially formulated to suit thermal transfer printing, and using an acrylic-based adhesive.

Scott Paynter, managing director at Martek, explains: "We have been encouraged to supply this system because of a shift in the price of the



Linerless print-apply: Above: 3M's Matic SA 2000 machine, which was introduced at last year's PPMA Show. Right: The Irplast Freeline from Martek Industries

material, and Irplast's ability to produce this at the right cost compared with die-cut paper labels." He puts the material saving from linerless labels at 30-40 per cent.

On the other hand, Mr Paynter says, the price of the equipment itself is higher by a

similar proportion of between 30 and 40 per cent, depending on the print-apply system being compared.

High volume producers

For this reason, Martek expects potential users to come from the high-volume producers turning out, say, a million outer case labels per labelling machine a year. On this basis, he says, payback would come at between 12 and 18 months.

The original tamp/blow applicator has now been extended by other options, says Martek. These include roll-on flap application, trailing edge corner wrapping and front/back pack application for product coming out of a shrink

tunnel, for example. The system uses a Sato print engine and gives speeds up to 50 cycles a minute.

Martek admits that, given the relative newness of the technology and the complexity of cost and payback calculations, it will not be easy to move even high-output food and toiletries manufacturers in this direction. Consequently, it is encouraging long-term trial installations.

However, a further benefit to be considered, compared with traditional technology, is said to be the system's ability to combine two different label lengths on the same reel, simply changing the applicator programme to set a different cut length.

Over the past year activity in the linerless print-apply market has certainly accelerated with last year's PPMA Show, for example, seeing the launch of 3M's Matic SA 2000 machine which operates with Scotch linerless pressure-sensitive tape. Labels of variable length – between 50 and 200mm – can be produced from the same roll, eliminating reel changes for different size labels and reducing inventory

CODING AND MARKING

costs. Speed is up to 15 labels a minute.

3M points out that as well as reducing material costs, the absence of a liner also allows much longer reels to be used, diameter for diameter, providing longer periods of uninterrupted running.

The Matic SA 2000 is now being distributed within the UK by Sussex & Berkshire Machinery, which is also offering the applicator as part of custom designed labelling systems with the necessary software integration into existing lines.

Not everyone is so sanguine about the short-term prospects or viability of linerless print-apply. Pago UK's Swiss parent company introduced its own direct thermal linerless system some five years ago, says managing director Mike Cooper, and some of the material and systems have been sold in Switzerland.

"But the material is very expensive," he says, adding that although Pago looked into the practicalities of combining coding and handling with a guillotine and an applicator, the technology has not moved on.

Environmental reasons

A key benefit of linerless systems, Mr Cooper points out, is the avoidance of siliconised paper for environmental reasons. "But up to now, the environmental penalty has not been such that end-users felt they had to get rid of the liner," he says. Pago is also sceptical about the total cost equation, where the liner is an integral part of the application process engineering.

As Mike Cooper notes, end-users who cut corners by using cheaper ribbons and label stock on traditional print-apply machines will often end up paying out in new printheads more than they have saved in materials.

Similar considerations are likely to apply with linerless costs, he argues, even before the issues of downtime and roll changeover are addressed.

Pago itself scored a recent success in more conventional print-apply with the delivery this April of 11 case labellers and one pallet labeller to a "leading multi-national toiletries company". The traded unit labellers use Pagomat



Print-apply installations: Above: Logopak 920PF pallet labeller at Hibernia Food Bakeries. Right: Pago has delivered 11 of these Pagomat 15/120E heads to a major toiletries company



15/120E heads and offer coding and application speeds up to 300mm/sec.

One key benefit of the 300dpi printer was that it is able to generate a 2D matrix code. "The customer wanted to get internal line data into as small an area as possible," says Mike Cooper, adding that the use of a 2D code as opposed to a standard bar code helped to distinguish internal from retailer data.

But he identifies the question of labelling software as being the one which really clinched it for Pago. "This customer was being quoted large amounts of money by other line integrators which did not have the software. As a basic rule, if you're only talking to mechanical engineers, the price can be at one level, but once you bring in IT people, the figures are totally different."

Pago's proprietary Pagowin labelling platform allows it to keep software costs down, Mr Cooper explains, since it avoids the need for a complete customer-specific set of codes to be developed every time. Access to databases of order numbers and product codes is built into the standard package.

The pallet identification system installed was the Pagosystem 428, an automatic print-apply unit which uses the Pagoxpc (extended pallet control) software.

Elsewhere, new print-apply installations include a pallet labelling system at Hibernia Food Bakeries, where a Logopak 920PF is

printing and placing labels on to two consecutive sides of a pallet. The system uses thermal printing across a 216mm-wide area, and bar codes are automatically scanned after being applied by a telescopic vacuum pad. Single labels are applied at speeds up to 180 an hour.

In fact, at last year's PPMA Show, Logopak gave details of a new system to extend the working life of the ceramic print imaging plates in its print-apply labelling machines by up to five times, compared with the industry standard of about 500,000 labels 100mm long, or 50km.

With replacement costs for a conventional

print plate in the order of £500 each, depending on print engine width, the new Logopak SFB system (Superfine Glas Bedampft) is expected to save a high volume user over £2000 a year on each machine, despite its slightly higher cost. The system uses an additional microchip in the print plate control to regulate

the heating elements in such a way that their life is extended.

In one recent installation of seven Logopak print-apply machines, print plates are now lasting 175 to 279km with no change in the normal cleaning procedures. "In effect this means that the user will be replacing print plates once a year, rather than once every two months," points out Logopak general manager Wilson Clark.

Validating the code

Code validation is increasingly important, whatever the product type. A system installed by Codeway at one multi-national food processor receives batch data at the PC controlling the labelling operation. After case and pallet labels are printed with EAN data and the labels applied, a Checkrite barcode scanner ensures that the bar code is correct. If not, the case is diverted.

In a quite different product area, Woolworths company Entertainment UK has been using ALX 2038 modular print-apply units from Advanced Labelling Systems. To date, the company has had three systems delivered, and is

awaiting a fourth which will increase the operation's case-labelling options.

The systems use Zebra PAX3 print engines, and produce up to 100 labels a minute, with a print resolution of 300dpi. Key for Entertainment UK was the flexible applicator, which allows top, side or base application of labels.

Similar versatility is offered by the Little David LS-800/DT multipurpose print-apply system supplied by ITW company Loveshaw Europe. Here, though, the options are: corner wrap, dual tamp and single tamp. The particular application can be selected via the micro-processor-driven controller, says Loveshaw.

Cobalt introduced the new Power 2000 print-apply labeller at the Ipack Ima exhibition in Milan during March, claiming that "exceptional performance, versatility and Italian styling has never been so affordable."

The machine is said to run at speeds in excess of 300 printed and applied labels a minute, even with a typical label size of 102 x 51mm. With smaller labels even higher speeds are achievable.

Models are available for front-of-pack application, round corner, adjacent sides and application to curved or round surfaces and fragile products, using interchangeable labelling tools.

In primary pack food labelling, new technology includes the Series 620 from Delford. Designed for bakery, meat and ready meal applications, the 620 is available in 60-pack-a-minute and 200-a-minute versions, free-standing or mounted above or below a given line. Thermal or thermal transfer coding gives print resolution of 12 dots/mm, says Delford.

Bizerba's latest weigh-price labeller is the GLM-I which, again, can be configured to label the top or bottom of a pack. Data can include fixed price, fixed weight, variable weight/price, logistics, declaration and traded unit labels. The three variants available label at speeds of up to 70, 100 or 150 packs a minute, with a coding resolution of 12 dots/mm.

For further information:

3M
Advanced Labelling Systems
Bizerba
Cobalt
Codeway
Delford
Logopak
Loveshaw Europe
Martek Industries
Pago

enter 167
enter 168
enter 169
enter 170
enter 171
enter 172
enter 173
enter 174
enter 175
enter 176

INK JET PRINTING

Quality rests on case handling and ink throw

Perceptions and applications of outer case ink jet coding appear to have undergone a significant shift since the e-centre's Barcode Users' Group began to study – and publish – best practice in this area.

Views are still mixed on the relative reliability of print-apply and direct ink jet coding for outer case bar codes, with most end users still preferring not to risk direct-printed codes in an increasingly automated and unforgiving retail environment. The fact that recent advice from Tesco is said to have included the application of two bar codes to different sides of the traded unit does betray a certain lack of faith in this approach.

But the e-centre guidelines have made it clear that, despite the theoretical risks, there is no reason why direct ink jet cannot be used to apply fully scannable bar codes. Crucially, the coding technology itself is seen as having passed some notional test: the emphasis is now on how that coding capability is used.

Technical manager at Imaje UK Paul Ellison explains: "Ink jet has come on considerably over the past five years in terms of producing high-resolution bar codes. But when you talk about coding, the case handling and throw distance are both critical, and even atmospheric conditions can influence the result."

Four jetted version

Imaje has its S8 range of ink jets, including a four-jetted version particularly well suited to non-porous cases. For lower-specification needs, it has the MCP drop-on-demand system, which uses an oil-based ink, and the low-resolution Crayon X-tra large character printer.

According to Martek Industries managing director Scott Paynter, many of the e-centre recommendations such as printhead positioning, monitoring of code quality and regular maintenance were very much common sense. "And a number of companies have been encouraged to look at positioning systems in particular," he says.

CODING AND MARKING

Martek is a supplier of Marsh ink jet systems, among others, and the US company has contributed to this focus with its own slide bracket, which tracks the print head backwards and forwards. Scott Paynter believes that end users wanting to use direct coding on to outer cases have also been helped by the increased use by case and liner converters of paler substrates, to provide an improved scanning contrast for bar codes.

For its part, Martek has just launched the Marsh Encore in the UK. This drop-on-demand large character ink jet manages a resolution of 300dpi by 150dpi, says the company. It also has the lower-cost, but still high-resolution, EBS-1500 from Germany, as well as the EBS-200, designed for fast-drying inks on non-porous substrates.

In fact, the EBS-1500 is available with a choice of seven dot matrix printheads giving a range of resolutions and is also able to print up to ten lines of print. Micro-nozzles can also be employed to reduce the size of each printed dot, so allowing codes as small as 3mm to be printed in restricted space and with minimum ink.

But the real evidence of renewed interest in the direct case coding market comes from new

entrants. Linx Printing Technologies has moved into outer case coding for the first time with its IJ600 printer which, it says, manages to combine reliable performance with a low cost of ownership, unlike either print-apply or drop-on-demand. The single jet array can achieve a resolution of 7 dots/mm, says Linx, on characters, images and barcodes up to 70mm high.

Signs of a shift in the market are also coming from end users. According to Markem, GlaxoSmithKline (GSK) first trialed ink jet printers for direct coding on to outer cases in 1998. At that point, the poor bar code definition convinced the multinational to stay with print-apply labels. But when GSK's case supplier, Smurfit, suggested trying Markem's 5000 series touch-dry ink jet, the results met with the pharmaceutical company's approval.

Less inventory necessary

Besides direct cost saving on labels, packaging, origination and in cleaning the machinery, using the 5000 series touch dry ink jet coders meant less inventory was necessary in the warehouse while management time spent ordering, handling and storing corrugated



Coding vials: Searle is using ultra-violet inks and a Domino ink jet to apply data matrix codes



Low cost system: EBS-1500 ink jet from Martek uses a choice of printheads



Egg coding: Imaje S8 Egg Master provides up to four lines of text

cases and labels was significantly reduced.

There were also many instances where elements of GSK's packaging process would be more efficient.

Dates and codes could be programmed in and easily changed, as could artwork origination, of which many different variations could be stored indefinitely. This offered a number of benefits since cases have to be printed in over 190 different styles and languages.

Meanwhile, the Infineon ink jet printer, launched by Interactive Coding Equipment (ICE) at last year's PPMA Show, is reckoned to be the first fully self-cleaning case coder, overcoming the effects of factory dust and vibration on print quality.

ICE says that with the new machine's arrival, "high resolution on-line printing has finally become a realistic alternative to printed labels and pre-printed outer cases, offering users significant cost savings while guaranteeing high print quality."

The self cleaning system operates automatically every time the machine is asked to print,



Six lines of text: Metronic alphaJETc can be equipped with up to four heads

purging the heads and repriming the system. However, unlike manual purge systems employed on some ink jet coders, the ICE system avoids risk of wasted or spilt ink. As the heads are purged, an air knife diverts the ink to a catchment slot, maintaining cleanliness and allowing the ink to be filtered and recycled for further use.

The 180dpi print heads have 500 addressable jets, allowing bar codes, logos, time and date fields to be reproduced directly on outer case packaging. Print area is 70 x 400mm for

each of up to four print heads at a maximum print speed of 33 metres a minute.

"Typical print costs are one tenth that of an equivalent printed label giving a typical return on investment of under 12 months," says ICE. A central ink management system allows up to four heads to be operated per machine. Ink replacement is by a sealed ink bottle, with no need to stop the line.

U-V coding on vials

Of course, ink jet is still proving popular in applications other than outer case coding.

One niche role for the technology has been in marking product with covert u-v readable codes. US pharmaceutical producer Searle R&D now employs Domino ink jets and u-v readable inks to code its vials which are sent all over the world. The data matrix code used also has the advantage of being sufficiently compact to fit on a 2ml vial. Scanning equipment from Systech is used to check every vial for correct identification.

Coding solutions have to be responsive to changing legislation, and the introduction from January 2004 of new EU legislation for egg producers is forcing small to medium-size businesses, as well as the larger ones, to invest in cost-effective direct coding for individual eggs. Imaje says its S8 Egg Master combines with food-grade inks to provide four lines of text from a single printer, integrating with egg-graders to code up to 150,000 eggs an hour.

With its eye more on the mainstream, Metronic Printing & Coding is targeting specific industries with its in-line alphaJETc continuous ink jet system. The coder, which can lay down up to six lines of text can be specified in single, twin or four-head versions, and is aimed particularly at the food, dairy, pharmaceutical and electronics sectors.

The alphaJETc can also be integrated into Metronic's off-line UDA150 carton over-printer. Use-by and sell-by dates, as well as price and other data can be applied to carton blanks, fed from a magazine, using ink jet, hot foil, thermal transfer or laser.

For further information:

Domino UK	enter 177
Imaje UK	enter 178
Interactive Coding Equipment	enter 179
Linx Printing Technologies	enter 180
Markem Systems	enter 181
Martek Industries	enter 182
Metronic Printing & Coding	enter 183

LASERS

Attention turns to mid-speed applications

After much hype when dot matrix laser first appeared, initially seen in some quarters as a direct competitor to continuous ink jet, and then more recent interest in the higher quality achievable with the new generation of scribing lasers, suppliers appear to have settled back into a rather resigned silence over this section of their coding portfolio.

Now that all of the big names in ink jet also have a laser alternative, the more expensive technology has largely been sidelined to the high-cost, niche solution that – rhetoric apart – it was all along. The international suppliers have all staked a claim in this area, and will be positioned to respond should mainstream markets genuinely begin to shift. But for now, this is certainly not where the majority of their – or their customers' – investment is going.

Imaje, for example, has its Lightjet Vector steered beam system which, it boasts, is still the most powerful laser tube on the market. Its 200W peak power contrasts with the 10W to 50W range into which most competitor systems fall, says technical manager Paul Ellison. Installations have gone into high-speed bottling and also food industry plants.

The company agrees that there is a potentially substantial market between the current £20,000 to £25,000 price tag on current laser systems and the £8000 paid typically for an ink jet coder. For the moment, though, Paul Ellison says Imaje has no plans to attack this lower-speed, lower-cost laser market.

But one company that is keen to be seen to



Small and light: Domino has introduced a 10W laser, the S100, which sells for around £12,000

innovate as much in laser as in ink jet is Domino. Rather than highlight the power of its tube, it claims to have the smallest and lightest laser coding head on the market. This is the S100, introduced earlier this year as the latest 10W addition to its S range, which already includes the S200. The 76 metres/min coding capability of the S range makes it suitable for low- to medium-volume production.

Closing the price gap

Previewing the arrival of its S100 last year, the company said it aimed to go a fair way towards closing the price gap between laser and ink jet, pricing the S200 at around £15,000 and the S100 closer to £12,000. Domino even estimated that, within five years, the new generation of laser technology may have replaced up to half the installed ink jet market.

Markem has also been extending its range of lasers, with the SmartLase SL130 CO₂ coder. Unlike Domino, Markem uses a 30W laser but, like its competitor, it is quick to claim that its new model is "surprisingly affordable". The variable position output lens makes it easy to integrate into existing lines, says the company.

Last year Linx announced that it had increased the character heights possible with its Xymark 10 and Xymark 10S dot matrix laser coders, giving the machines capacity to mark corrugated cases, trays and multipacks. A new optional articulated arm allows character heights to be increased from 10 to 16mm, with an overall message height range of 12-16mm and a maximum of four lines of 7 x 5 text.

Reduced spot size

In addition, the system codes at a reduced spot size to provide better print aesthetics for full-height characters while the range from print-head to product has also been increased to 180mm, to give greater installation flexibility.

Xymark laser coders are programmed using menu driven displays and special function keys. In addition, a full sized QWERTY keyboard is provided for message entry and a large back-lit display shows an exact representation of the message to be printed.

The Xymark dot matrix coding system itself is based on a high-speed, multi-faceted spinning mirror that deflects the laser beam sequentially through each dot position, from the top to the bottom of a character or vice versa, with the laser switched on for each dot required.

For further information:

Domino UK	enter 185
Imaje UK	enter 186
Linx Printing Technologies	enter 187
Markem Systems	enter 188

THERMAL TRANSFER

Specialist systems look for a product difference

As a technology, thermal/thermal transfer is holding its own in key markets, but remains a highly competitive area. Consequently, suppliers are eager to differentiate their ranges from the rest of the field, and the bigger names have worked hard to segment the market between lower-cost systems and the tougher industrial type of machine.

Imaje is among those who have been carving out a specialist niche for themselves. The launch of the MP Nova range earlier this year gave the company a series of machines designed for the harsh environment of transport, warehousing and logistics. They are said to be suitable for continuous use, and have the additional benefits of advanced connectivity.

As Imaje's thermal products manager Steve Ellison puts it: "The mainstream thermal desktop market has become a bit of a commodity area. We are not competing with the Satos and the Zebbras; we see our machines as being for specialist markets."

In particular, Imaje has been targeting mobile applications, such as forklift-mounted systems. This was an area that was already well-served by Markpoint, the company which Imaje bought two years ago. The two ranges now available are the Nova and the Compact, for low-to-medium capacity needs.

The company is dismissive of those suppliers which talk up the significance of high printing speeds. "Printing barcodes or quality text is simply not possible at the highest speeds," says Steve Ellison. Even where a thermal transfer coder is billed as being capable of printing at 12in/sec, he says, end users will still run it at 8in/sec for critical data.

But even if high speeds may not be a real issue for many applications, print resolution can be, especially where fault-free barcodes and exceptionally clear text or graphics are required. Sato says its new M84pro prints at over 600dpi (24 dots/mm). Since it also has an

interchangeable printhead, it can alternate between producing high-resolution print on better quality materials and 8 or 12 dots/mm on label printing, for example.

Sato says that the high print quality would make the M84pro ideal for very small bar codes, 2D codes and high quality point of sale labelling. The machine is based on Sato's M8400, which it says is its most successful industrial printer. But in the M84pro, the company has responded to what it says is a growing trend towards added versatility, where end users do not necessarily expect to have



Thermal transfer: Top: Sato M84pro desktop printer. Above: Imaje MP Nova industrial printer. Right: SmartTouch user interface for Markem coders

different printers to carry out different jobs.

Codeway is now supplying the Avery AP 5.4 thermal transfer printer, which is able to print labels up to 16mm wide at 8in a second in continuous production. Like Sato, Avery appears to have seen the benefit of offering different print resolutions from a single printer. If necessary, the industrial quality 200dpi printhead can be detached with a thumbscrew and a 300dpi retail standard head substituted, says Codeway.

High speed overprinters

High speed thermal coding is, of course, necessary in overprinting for web-fed packaging machinery and, last year, Thermo Allen Coding introduced a new range of high performance machines – designed particularly for applications in which the data varies on every image.

The machines are based on Allen's TT531M intermittent motion printhead, which has been modified to incorporate a PCB, and operate under Windows-based software.

Three models are available. The AC531M intermittent motion coder and the AC53CM continuous motion coder each offer a print area of 53 x 75mm while the AC 1071 M coder prints on an area of 107 x 75mm. All three are operated from a newly designed compact control box which, for flexibility in installation, is



connected to the coder via a 10 metre cable.

The print speed of the AC531M and AC1071M coders is up to 280mm/sec while the AC53CM coder can operate at 600mm/sec. Standard software allows print rotation and mirror printing and there is also an auto-diagnostics package.

For use in a damp environments, the units are rated at IP65. Also, they can be equipped with pre-heaters to provide consistent print quality



on different packaging materials when operating in cold factory conditions.

Finally, on the control side, for on-line management of its SmartDate thermal transfer coders Markem has introduced the SmartTouch unit. Measuring just 240 x 150mm, the system can be used to design and store new label layouts for one or more coders.

It is designed to work with SmartDate 2 and 3 coders, as well as with future models in the range and, being portable, also allows users to network a number of Markem printers without the use of a PC.

For further information:

- Codeway
- Imaje UK
- Markem Systems
- Sato
- Thermo Allen Coding

- enter 190
- enter 191
- enter 192
- enter 193
- enter 194



Validating materials: Claricom Scanpoint ensures the packaging is correct

CODE MANAGEMENT

Validation system checks the packaging is correct as well

Claricom has added The Scanpoint Packaging Validation Module to its Package Coding Management System – used to set up all the coding systems on a line – giving the opportunity to ensure that the correct packaging is being used for the product.

The new module uses portable handheld barcode reading equipment to confirm the correct use of packaging and materials for the selected job, without the need to modify current packaging artwork. For example, the software can be used to confirm that the promotional label is correct, or to check the correct correlation between lid and pot, or top label and base label for the given product. In addition, control can be automated to ensure not only the correct label, but also the correct version of the artwork.

Enhancements to the job selection procedure have also been made to prompt the operator to confirm each item of packaging is correct before the job is selected. For example, the operator can be prompted to scan the secondary barcode – the EAN128 barcode – as part of the line set up and the system will confirm both that the correct product barcode is selected, and that the durability date corresponds to the correct primary pack coding.

This EAN128 validation is especially relevant where case label printing is performed off-line or where labels are printed one or more days in advance, points out Claricom. "In these situations it is possible that, although the product code may be correct, the durability date is wrong. The new Clarinet module is designed to reduce the scope for errors of this type."

More information - enter 195

For further information on items appearing in Machinery Update, enter the appropriate number on the free reader service card in this issue.