

Metal Decorating

The control of coating thicknesses being applied to tinplate sheets using a closed-loop system that relieves operators from having to monitor the process has been under development in a collaborative project between Germany's Koenig & Bauer and US-based SpecMetrix.

Driven by demands from the market, customers and suppliers, such close relationships propel innovation, says head of product management Damian Pollok.

"We need to know what the coating supplier needs, how it needs to be applied, how it needs to be cured. The coating supplier needs to know how their coatings react to the curing. The end customer needs to be on board as well because they have to make cans or closures out of it. You can drive the technology forward only when you're working closely together," he says.

That collaboration is shown on the testing of coatings on the Metalcoat 483, with support from the SpecMetrix Systems team, brought in for their expertise in taking



Koenig & Bauer's latest metal decorator, the MetalStar 4

Raising the bar

precise measurements in real time of the coating thickness on the coating line.

Pollok explains: "SpecMetrix systems measure the film thickness at high speeds and feed the real time results back to our machine, which adjusts itself to apply the coating within the specifications. It's a closed loop process, so the operator does not have to check and manually readjust the machine, it does it all automatically taking the operator skill and variability out of the equation."

Following successful field tests, Koenig & Bauer are preparing the machine and code for the customer, who will carry out further testing to have it completely integrated into production. "From the results we've seen so far and the feedback that we got, it looks very promising," says Pollok. The amount of coating for the security layer could be reduced to 5%.

The results are expected at the end of the year, and Koenig & Bauer aims to offer retrofitting to existing MetalCoat 483s, and the upgrade as an option for all new MetalCoat 483s.

*Coating and decorating aluminium beverage cans and tinplate sheet is becoming much more sophisticated with tighter process control, quicker label changes and more customisation. **Nisa Ali** reports*

Saving energy

Koenig & Bauer is also developing processes for the UV-curing of coatings and inks, and the use of LED lamps, under the Metalcure brand, which was announced at Metpack.

The technology, also being developed in Brazil by canmaker Brasilata and coatings firm Actega, offers the potential for huge energy savings compared with thermal curing.

"We have a machine here in Stuttgart for testing, customer demonstrations and trials and we are doing a lot of testing for customers with UV LED inks and coatings," Pollok says. "There's a lot of development happening right now in UV LED coatings, especially in the area of cationic coatings."

He adds the company and its suppliers learned a lot during the trials, with remarkable results: "For the comparison

of UV to UV LED we can see a reduction in energy consumption by up to 70%."

Energy consumption is one of the biggest concerns for users of metal decorating presses. Koenig & Bauer's energy management system, called VisuEnergy X, collects data on energy consumption and gives the customer user-friendly and easy-to-understand analysis of the energy consumed and carbon dioxide emissions. The software can collect data from various sources, which can be installed in any kind of machine – not limited to Koenig & Bauer equipment.

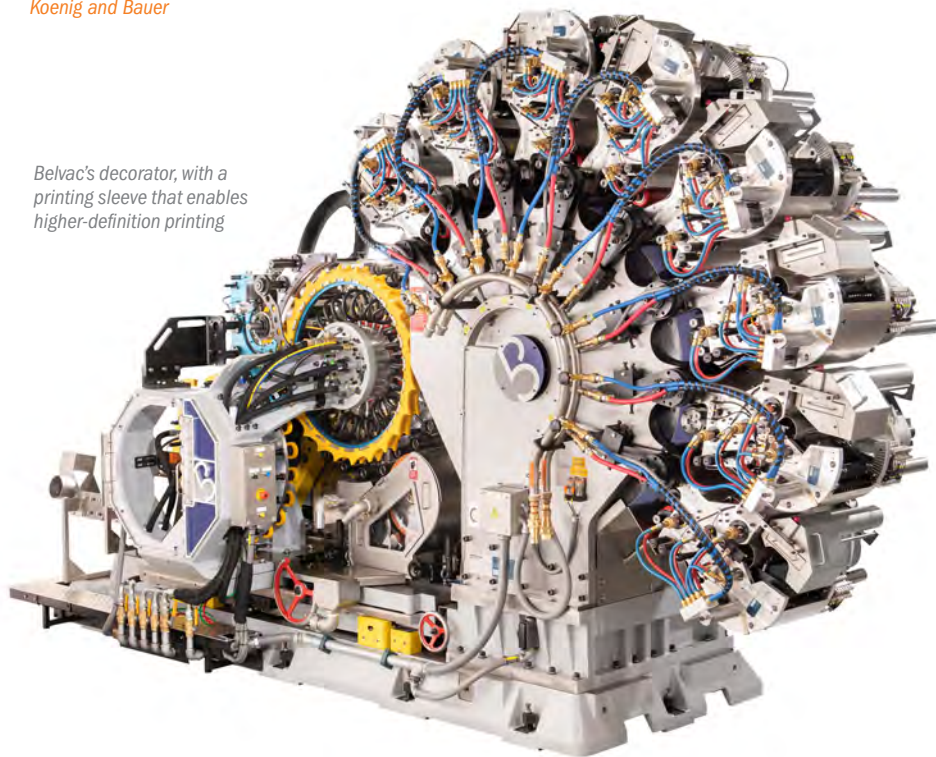
"This is really useful in trying to understand how much energy we consume," he says. "If you want to make decisions, you need details. And this is what VisuEnergy X is about: cross-site and independent capturing and visualisation of energy-dependent figures."



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Damian Pollok
Koenig and Bauer

Belvac’s decorator, with a printing sleeve that enables higher-definition printing



Basic RTO Operation

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Above Koenig & Bauer’s MetalStar 4 in action on a demo line in one of their assembly halls in Stuttgart. The MetalStar 4 performed tests from May 2023 until the end of August, including using cationic UV-LED inks and overprint coatings on metal sheets, for example, for 3-piece-cans

Pollok adds: “We did a lot of tests. We learned a lot. I think our suppliers learned a lot. Having made all of these trials for the last few months, we really got good feedback from the suppliers and the market, so our customers understand what is possible and our coatings suppliers learned what they need to improve and how their product is performing.

“I think we really have a good impact on the market, having all the suppliers here, all of the customers here, and working together to see what the technology is capable of.”

Quieter operation

Developments on Koenig & Bauer’s MetalStar 4 sheet decorating press include making it quieter and more stable.

However, there were a few hurdles on the way – on the feeder and infeed, with air management and with coatings. The only way around such issues was testing at customer sites.

Pollok says: “Air management is a very critical point for the feeder. With the MetalStar 4, we have all the settings controlled by touchscreen, so I can type in the numbers, how much blast air I need, how much carrier air I need, and save these settings. If I run the same material, let’s say in three weeks, the operator can load the saved settings and is pretty much good to go.

“We spent a lot of time on customer sites, testing to see if it works with different materials. Right now, we are very happy with the results.”

Operators at one company with a MetalStar 2 and a MetalStar 4 told Koenig & Bauer that the new iteration was noticeably quieter during operations.

“Operators really like to have this faster and quieter machine, with good results,” says Pollok. “It was really nice hearing from the actual operator because they are working every day with the presses.”

The MetalStar 4 comes with the latest upgrades for the feeder and infeed. There are also upgrade packages on the earlier MetalStar 4 for the most critical parts, and for the MetalStar 3.

Operator friendly

Higher productivity in high-speed printing of beverage cans is being developed at Belvac Decorating Systems, part of the US-based Belvac group, through faster plate changes.

Aditya Pelluri, product specialist for decorating at Belvac, said its printing sleeve offers higher-definition decoration, and a quicker turnaround during label changes.

“The Belvac Printing Sleeve allows up to eight colour label changes in a third of the time versus conventional magnetic cylinders using printing plates,” Pelluri says. “The locator pin facilitates an accurate, consistent, and repeatable registration alignment that results in a lower spoilage for each respective label change.”

The design means there is no longer a need for plate alignment on the magnetic cylinder for label changes which results in more sellable cans per label change. ▶

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“The laser etching system is similar to plate engraving and is readily transferable knowledge. Additionally, if desired, the decorator can switch between conventional magnetic cylinders with plates or the Belvac Printing Sleeve.”

Improvements to the performance of Belvac’s Rutherford-style decorator have focused on structural stiffness to improve “overall print quality, machine performance and reliability,” says Pelluri.

The linear spindle disk has been upgraded to replace bushing style disks, reducing runout to less than 0.01mm and wobble to 0mm, reducing vibration and enabling cans to smoothly load onto the mandrels at up to 2,200cpm for higher quality print.

The infeed has also been upgraded to the vertical style with a vacuum starwheel, which increases speed by eliminating can gapping during loading.

Improvements have also been made to the inking units. “Our easy maintenance inkers reduce misting and ghosting while also offering an efficient ink wash up feature,” Pelluri says. “The colour kit is upgraded utilising class zero bearings on the main shaft, the wobble on the blanket wheel and bull gear is zero, which optimises print quality.”

Furthermore, the over varnish unit has been upgraded to a reverse-style, which reduces misting and spillage issues.

Easier and safer

Stolle Machinery has introduced improvements to its Rutherford beverage can decorator to make the changing of printing plate cylinders easier and safer.

The use of a tapered shaft, which comes as standard on all new Rutherfords, makes the fit more precise as it is drawn onto the taper by a captive retaining bolt.

This makes side-lay adjustments of the cylinder easier after installation, and it releases more readily, says Rutherford deco product manager Mark Santos, adding that this makes label changes quicker.

Stolle offers a special installation and removal tool which keeps the technician’s hands out of the blanket wheel area. This includes an integrated wrench that will loosen and tighten the cylinder retainer bolt.

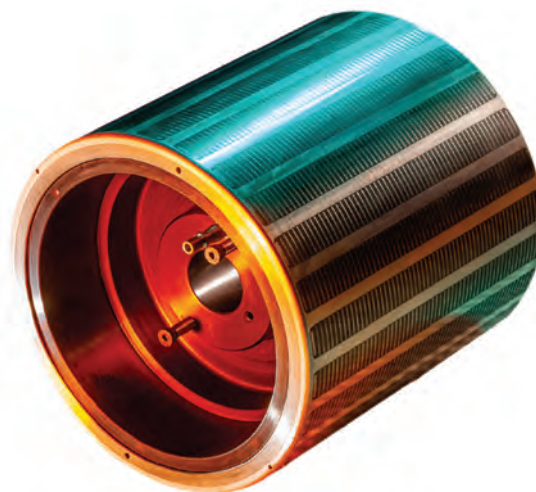
The tapered shafts are available in three models to fit different versions of inker units: a standard shaft, a water-cooled shaft, and a rear lubrication shaft – and are available as a retrofit for all existing units.

In a collaboration that was announced earlier this year, Stolle is now the sole distributor of UK-based Sandon Global’s pneumatic plate and roll mounting systems, for use on Stolle’s Concord and Rutherford decorators.

Changing the plates, and gravure and applicator rolls in the



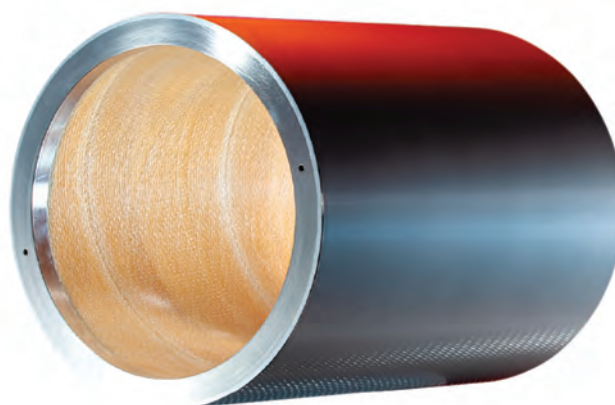
Above Installed as standard on Rutherford Decorators, the tapered shaft plate cylinder is designed to enable a precise fit



Above The MagPro system is claimed to be the only pneumatic plate mounting system in the world



Above The GlidePro offers reduced varnish consumption



Above The GravLite System is said to ensure cleaner engravings on the sleeve

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overvarnish unit is safer, faster and easier for the operator, says Andy Layden, Concord deco product manager.

Three systems – MagPro, GravLite, and GlidePro – have special mandrels that mount in the same way as the standard plate cylinders, gravure roll and applicator rolls. The difference is that the mandrels have an air fitting that compresses an internal air membrane, which enables the interchangeable sleeves to easily slide on and off the mandrels. The mandrels do not have any moving parts and do not need maintenance.

For mounting the two printing plates on each Concord printing unit, the MagPro cylinder sleeve has magnets and pins. The operator has only to remove and install a light sleeve with the attached plates on the mandrel, without having to remove the heavy plate cylinder from the conical shaft. Once the plate sleeve is installed and air pressure is removed from the mandrel, the sleeve is locked in place to maintain precise printing registration of the plates. A version of MagPro is being developed for the Rutherford decorator.

The GravLite system is designed for use on the overvarnish gravure roll on Concord and Rutherford decorators and also makes changing them easier and safer.

Weighing just 2.4kg, the removable sleeve's engravings stay cleaner for longer, and this results in more efficient lacquer transfer. The gravure roll change takes two-and-a-half minutes, says Layden.

With the GlidePro system, the overvarnish applicator, mandrel and sleeve can be removed and installed when air pressure is connected to the roll.

Layden says the accuracy of the GlidePro sleeve reduces varnish consumption and slinging, and coats efficiently with a lower



Above Dantex's Richard Bunney: focused on reducing costs and enhancing sustainability

applicator roll pressure, which enables decorator speeds to be increased. He adds that the system does not require manual mandrel adjustment and offers enhanced control of the total indicated runout (TIR).

The GlidePro system is currently available for Concord 24MRT decorators, but Stolle is working on extending the system for the Concord 36MRT and Rutherford decorators.

Game changer

Printing plate specialist Dantex is celebrating 50 years in the industry, stating it now provides 85% of all photopolymer plates for

metal decoration. It is the largest distributor in Europe of letterpress and flexo plates and a supplier of water-wash photopolymer plates and processing equipment.

Managing director Richard Bunney, a former Ball Corporation executive who joined UK-based Dantex in 2021, outlined the central role his company plays in metal decoration for the canmaking industry.

"Printing plates are integral to decoration in direct to print, and ingrained in dry offset. When we released the new Marathon Processor, it was a game-changing machine and all about efficiency," says Bunney, who is focused on reducing costs for customers, and helping enhance their sustainability.

"Water is no longer a plentiful commodity, so we worked on a process to save up to 75% of water. We had a really fantastic response, and we've sold 23 new processors to the dry offset industry. We've had a good uptake and the feedback has been very positive."

The company's Marathon processors produce plates for dry offset printing in eight colours for beverage and aerosol cans.

"One of the requests we regularly get is that customers want the best print quality," says Bunney. "We can get about 120 lines per inch, but it depends on the plant. Our plates hold very good dots down to 1%."

Dantex offers a remote diagnostic service, which saves time and money both for its customers and themselves.

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*Richard Bunney
Dantex*



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The "game-changing" Marathon presses

"Previously we had to send our engineers across the world. Now we can [solve a problem] from Bradford in the UK. Having 10 minutes of downtime, instead of three or four days is a massive advantage. It's positive for the customer."

Partnerships have been key to the company's reputation and endurance such as with Esko in Belgium and Toray in Japan.

This reliability has also fostered strong relationships with large global canmakers such as Ardagh, Ball and Crown, and with independent canmakers such as Lion in Turkey and SGS in the US.

Demand for customisation

US-based tin mill service centre Reynolds Services Inc (RSI) is expanding into digital printing to provide a customisation service, says general manager of coating and decorating Brian Bates.

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Reynolds Services Inc (RSI)

For over a year, we've been running custom runs and prototypes for several customers who approached us with the need for highly customisable cans," Bates says.

The Greenville, Pennsylvania, firm has installed two digital UV printers for decorating flat sheets or formed tins that are able to apply 10 different inks, with sheet runs up to 250.

"It provides us with good size and colour gamut, typically gloss or matt. We did a good bit of testing to find the best solution that would give us the biggest colour gamut and print, and sharpest quality, and fit customer requirements.

"We have been getting good feedback from customers who are excited by performance and customisation," says Bates, who adds that the digital UV printer has made life easier.

"In future, I see this type of environment expanding as the technology expands to do larger ends and longer runs."

More information:

www.koenig-bauer.com
www.belvac.com
www.stollemachinery.com
www.sandonglobal.com
www.dantex.com
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