Can Solutions

Technology & high standards in quality printing and drying for beverage cans
Solutions for beverage cans
Next-level solutions for 2p decorating

With KBA-CanSolutions, the comprehensive printing expertise of KBA-MetalPrint is now also made available to specialist beverage can decorators, complementing the company’s product portfolio for the 2-piece market. New, highly advanced printing technology is combined with established products such as pin and belt curing ovens and brought together under the name KBA-CanSolutions.

Print quality from the inventor of the printing press
KBA has been serving the graphics industry as a strong partner and customer-oriented innovation motor for 200 years. Responding to the changes in the printing industry, KBA has also evolved into a system supplier of integrated solutions, not least for packaging printing. This process is now to be carried into the segment of “2-piece decorating” with KBA-CanSolutions.

The comprehensive printing know-how of Koenig & Bauer AG has fuelled the development of the ground-breaking CS MetalCan, and sets new standards for yet another branch of the industry.

Drying technology from the experts
Our expertise is based on almost 90 years of experience. The company LTG developed the first drying ovens for metal sheets. The established drying systems CS PinOven and CS BeltOven have also been a subject of constant further development over the past few years. Energy efficiency has been raised another notch, and the overall performance of the drying systems has been perfected.

Networked systems
With KBA-CanSolutions as a system supplier covering the entire print production process, it is now for the first time possible to obtain equipment for the decoration and drying of beverage cans from a single partner. In addition, the stepwise networking of several CS MetalCan systems is also possible. In this way, users can at last guarantee constantly high printing standards anywhere in the world.

Safety and savings
Previously hazardous work steps, such as job changing in the vicinity of rotating machine parts, have been fully automated. The operator is thus able to concentrate on the essential task of maximising print and product quality.

The introduction of state-of-the-art solutions for processes such as plate and blanket changes, as well as for pressure, register and inking settings, achieve dramatic makeready savings in connection with job changes.

KBA-MetalPrint GmbH
KBA-MetalPrint is a subsidiary of the Koenig & Bauer group, one of the largest printing press manufacturers in the world.

Over 100 years of experience, building upon the know-how of the renowned companies LTG, Mailänder and Bauer + Kunzi, make KBA-MetalPrint the market leader in the fields of metal decorating, coating machines and drying ovens for the metal packaging industry.

www.kba-metalprint.com
The first 10-colour print section for beverage cans with keyless inking units and state-of-the-art drives

Quality with keyless inking technology

Quality
The CS MetalCan enables a new level of production stability from the first to last can of a run. The keyless inking technology minimises the variations of the ink transfer which are practically inevitable over the course of a run when using a conventional inking unit, even during acceleration and deceleration processes. The settings for register and printing pressure for the CS MetalCan can be entered conveniently via the operator touchscreen, and are then realised by the relevant control motors during production. The display provides the operator with a constant overview of the current machine settings and facilitates exact adjustments as and when necessary.

Productivity through automation

Productivity
The motors of the CS MetalCan are engineered for a maximum speed of 2500 cpm. It is not least the keyless inking technology which enables this extremely high speed, as the thickness of the ink layer on the inking unit rollers is reduced and there is thus less tendency to ink splashing. The use and interaction of specially developed plate and blanket changers, which allow for either selective or complete job changes, reduce changeover times to an absolute minimum.

Safety
The significantly enhanced automation and the defined interactions of individual machine modules relieve the operator of many work steps in and around the printing unit. This automation establishes a safety-oriented working environment for the operator. Furthermore, the CS MetalCan implements a specially developed guard concept to eliminate all possible hazards from the operator’s workplace.

The CS MetalCan answers market demands relating to increasingly frequent job changes and product variability. The perfect interaction of all components serves to maximise quality, productivity and safety, as the basis for highly profitable beverage can decoration. Possibilities to prepare forthcoming makeready during on-going production, along with parallel makeready processes and simultaneous plate and blanket changing, lend a previously unknown boost to efficiency. The keyless inking technology developed by KBA achieves ultimate print quality.
CS MetalCan
Next-level printing

The CS MetalCan guarantees high-performance printing based on a sophisticated drive concept and keyless inking technology— all developed specifically for beverage can decoration. Save time with simultaneous changing of the plates and blankets, and prepare forthcoming makeready processes while the current production is still running.

10 inking units
The CS MetalCan possesses 10 keyless inking units, which opens up a whole new spectrum of colour options for beverage can designers. Furthermore, the individual modules can be exchanged in next to no time whenever necessary.

Keyless inking technology
The inking units of the CS MetalCan are modern, keyless inking units which have been developed specifically for beverage can decoration. They comprise a temperature-controlled anilox roller, an ink forme roller and different combinations of rider rollers to enable the reliable application of critical colours. The inking units are modular in design and thus easily exchangeable. Furthermore, the individual inking units are compatible with all mounting positions and can thus be removed and rearranged with a minimum of delay.

Unique drive concept
Drive concept
The drive concept of the CS MetalCan is unique. Each inking unit, and similarly the blanket wheel, possesses a dedicated drive and is thus driven separately. A digital drive shaft guarantees 100% synchronisation of the inking units.

Stable inking unit with 3 frame walls
Stable inking unit design
To accommodate the high loads and demands arising during production, the precisely machined cast-iron inking unit is designed with three frame walls.

Plate changer
The plate changer – again designed specifically for beverage can decorating – is a modular system geared to fast plate changing. The plates for a new job can already be placed in the loading channels while the current production is still running. When the command “Plate change” is given, the full set or any selected number of plates is changed automatically. The old plate is first drawn off the plate cylinder and slides into an ejection channel, making way for exact mounting of the new plate. The change process takes approx. 1 minute, whether for a single, several or even all plates.

Makeready during production
With the CS MetalCan, it is possible to prepare the plates and inks for the next job on those inking units which are not currently in use – while production with the other units continues! Makeready processes can thus be handled parallel to on-going production, and job changes are accomplished faster than ever before.

Ink tray
The ink reservoir is similarly a separate modular system and completes the overall concept of the CS MetalCan. Comprising an ink tray, a chamber blade beam and a quick-action mounting facility, the whole reservoir can be exchanged in a matter of seconds. That eliminates all need for cleaning processes with the ink reservoir in place during job changes.

Blanket changer (option)
The blanket changer is designed as a fully automatic system. The ready-prepared blankets are supplied to the blanket changer in a convenient box. When the command “Blanket change” is given, the currently used blankets are first removed into a separate ejection box. Subsequently, new blankets are mounted on the blanket wheel. The blanket change process takes approx. 4 minutes. In addition, plate and blanket changing can be performed simultaneously!
**CS MetalCan**

**Benefits at a glance**

**Operation**
The CS MetalCan implements technological developments geared to future-oriented beverage can decorating. This is also reflected in the ease of operation. All significant machine commands can be viewed and entered conveniently via a 24” touchscreen display.

**Inking unit characteristic curves**
To ensure stable ink transfer even through speed changes, it is possible to create and save speed-dependent characteristic curves. The predefined, temperature-related parameters are automatically maintained by the control system and provide for stable ink application and constant print quality on the can even during acceleration and deceleration processes.

**Pressure and circumferential/lateral register**
The current settings for the printing pressure as well as the circumferential and lateral register in each individual inking unit can be checked at a glance on the display. An intuitive touchscreen menu permits the operator to perform any required adjustments to the inking units. These adjustments are realised immediately by the integrated motors, and settings are also possible while the machine is running.

**Spiral images**
Where a spiral image is to be applied to the can, the diagonal offset can be compensated through direct adjustment at the plate changer. Any chosen settings remain effective after renewed mounting of a printing plate.

---

**Quality**
- Ink stability over the whole can height thanks to keyless inking units
- Exact pressure setting permits extremely fine printing of linework elements
- Remote register adjustment while the machine is running
- Fewer ink splashes at high speeds
- High colour stability over the whole production run

**Drive concept with dedicated drives**
- 100% synchronisation for absolute register accuracy
- Settings and adjustment while the machine is running
- Inactive inking units can be disengaged and prepared for coming jobs

**Keyless inking unit technology**
- Highly dynamic ink transfer with fastest possible attainment of the target film thickness
- Freely configured characteristic curves to maintain high inking quality through any changes in running speed

**10 inking units**
- More inking units in a single machine than ever before
- Increased product design flexibility
- Ink for standard colours can remain in the inking units

---

**PressNet**
- Production planning and reporting
- Intuitive console operation via a touchscreen monitor
- Possibilities for machine presetting to further raise production efficiency

**Productivity**
- Significantly reduced set-up and makeready times
- Significantly reduced spoilage
- Higher speeds thanks to improved processes

**Labour safety**
- No simultaneous work steps while machine elements are rotating
- Automation of makeready processes
- Enhanced safety for the operator

---

**Technical data CS MetalCan**

<table>
<thead>
<tr>
<th>Inking units</th>
<th>10 keyless, inking units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plate changing</td>
<td>10 plate changers approx. 1 min./plate change for all inking units</td>
</tr>
<tr>
<td>Maximum production speed</td>
<td>2 400 cpm</td>
</tr>
<tr>
<td>Maximum motor speed</td>
<td>2 500 cpm</td>
</tr>
<tr>
<td>Can formats</td>
<td></td>
</tr>
<tr>
<td>– min. diameter</td>
<td>52 mm 2.0472”</td>
</tr>
<tr>
<td>– max. diameter</td>
<td>84 mm 3.3071”</td>
</tr>
<tr>
<td>– max. can height</td>
<td>185 mm 7.2835”</td>
</tr>
<tr>
<td>Blanket changing</td>
<td>manual or automatic (as an option) approx. 4 min./blanket change for all segments</td>
</tr>
<tr>
<td>Console interface</td>
<td>24” touchscreen display</td>
</tr>
<tr>
<td>Temperature control</td>
<td>Control of the anilox roller temperature</td>
</tr>
</tbody>
</table>
Advantages and benefits of the CS MetalCan

**Coordinated workflow and production environment**

A carefully coordinated workflow embracing the whole machine environment is an important prerequisite for efficient production. From handling of the ink trays and preparation of the printing plates through to CS PressNet and the associated facility for remote service via a VPN link, KBA-MetalPrint offers cutting-edge solutions for all fields of application.

<table>
<thead>
<tr>
<th>Increase line capacity</th>
<th>Print quality</th>
<th>Spoilage</th>
<th>Smaller jobs</th>
<th>Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed</td>
<td>Increase color</td>
<td>Massive spoilage reduction</td>
<td>Decrease job size</td>
<td>Decrease staff costs</td>
</tr>
<tr>
<td>Keyless inking units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label change time</td>
<td>Job preparation during production</td>
<td>Fast job change</td>
<td>Network &amp; job database</td>
<td>Job reporting</td>
</tr>
<tr>
<td>10 inkers</td>
<td>Save cost of material</td>
<td>Craft beer</td>
<td>Other products</td>
<td>Operations</td>
</tr>
<tr>
<td>Quality</td>
<td>Stability</td>
<td>Accuracy</td>
<td>Reproducibility</td>
<td>Safety</td>
</tr>
<tr>
<td>Stability</td>
<td>Accuracy</td>
<td>Accuracy</td>
<td>Reproducibility</td>
<td>Safety</td>
</tr>
<tr>
<td>Reproducibility</td>
<td>Accuracy</td>
<td>Accuracy</td>
<td>Reproducibility</td>
<td>Safety</td>
</tr>
<tr>
<td>Loss complaints</td>
<td>Accuracy</td>
<td>Accuracy</td>
<td>Reproducibility</td>
<td>Safety</td>
</tr>
</tbody>
</table>

**Control console**

The control console of the CS MetalCan is the printer’s principal workplace and stands out by way of its functional, ergonomic design. A 24” touchscreen monitor provides an intuitive interface, with screen keys to enter all the desired machine commands, settings and adjustments, for example printing pressure, register and inking. The visualisation software supports machine-oriented operation on the basis of clearly arranged screenforms. Individual functions and line sections are presented separately. Online language switching, furthermore, permits operators to view the control interface in their own native language.

**Another step closer to Industry 4.0**

**Presetting**

The presetting of various machine parameters for subsequent jobs contributes to fast makeready and minimised spoilage, while at the same time enhancing the stability and quality of production. A multi-stage presetting system saves appropriate PressNet data for selected jobs. Optimised values can then be pre-loaded for identical or similar jobs to further raise production efficiency. The operator can review the presetting data in the corresponding screenforms at any time.

**Reporting**

The detection and analysis of errors, as a basis for corresponding corrective action, is an important factor when it comes to increasing productivity and reducing costs. The reporting system permits comprehensive documentation of the entire production, with additional detailed production reports for each individual job. In addition, statistical evaluations can be performed over several production reports. Analysis of the saved speed diagrams is similarly a tool to support production optimisation. In this way, you maintain a clear overview of current performance at all times.
Fan housing
For efficient fan operation, the impeller wheel must be mounted in a spiral housing. The CS PinOven possesses four directly driven fans in spiral housings to facilitate targeted setting of the oven and thus operation at maximum efficiency. With the four fans, it is also possible to connect the motors directly, i.e. without couplings or belt drives, without the risk of bearing damage and overheating.

Exhaust air measurement
According to European safety regulations, an exhaust air volume must be measured. Technically, a volume in a duct can only be measured with differential pressure on an orifice, temperature and duct diameter. The exhaust air volume will be calculated and shown on the digital pressure switch. By reaching the minimum exhaust air volume, the digital pressure switch will send a signal to the safety PLC to stop the production.

Shaft seals
Equipped with two-piece-shaft seals designed for easy replacement. The seal change is possible without disassembling the bearing or shaft. Therefore, an adjustment of shaft / sprocket after the change is not necessary. The change could be done during a short stop of the chain run, e.g. during a label change.

Keyless inking unit
Keyless inking units always supply the required quantity of ink for each plate revolution, irrespective of the image to be printed. All otherwise necessary ink metering settings are eliminated.

Keyless inking technology
Keyless inking technology is the significantly reduced thickness of ink which must be carried on the rollers to achieve the desired ink application on the can. The risk of ink splashing and mist is considerably lower, as a result of which higher production speeds are possible.
The new generation of 2-piece drying ovens improve both curing quality and energy efficiency. Energy efficiency is the key focus of the new development. By optimisation of the oven thermodynamics, KBA-MetalPrint has produced a range of high efficiency low maintenance ovens.

By studying the specific requirements of the customers, KBA-MetalPrint has developed a new generation of 2-piece ovens which are setting industry standards for speed, production economy, energy efficiency, curing consistency and reliability.

Via advanced air flow technology, it has been possible to reduce the energy consumption by up to 30%. KBA-MetalPrint has also paid particularly attention to reducing condensate accumulation in all oven heating zones resulting in much lower maintenance and product spoilage.

Achieved energy savings up to 30 %

Features
- Intelligent exhaust and fresh air management
- Symmetrical exhaust ducts
- Individual zone air flow optimisation

Advantages
- Large energy savings
- Constant air pressure over belt width
- Reduced pressure drop to save fan power

Technical details
- All fans are direct driven with VFD drive
- All motors have energy efficiency class 1 (EFF1)
- High efficiency fans
- Reduced contamination by optimised fresh air intake
- Fully-welded gas-tight oven body
- 150 mm thick insulation panels
- Thermodynamically optimised recirculation fan air intake section
- Air mixture by Venturi-Jet-System design
- Built to CE standards

Features
- Intelligent exhaust and fresh air management
- New design of air delivery plates
- Optimised infeed and discharge areas

Advantages
- Optimised heat transfer to the can with large energy savings
- Easy maintenance
- Reduced cold air intake at the oven infeed and less oven fuming at the discharge

Advantages
- Consistent curing quality at high production speeds
- Optimised energy efficiency combined with advanced air circulation and nozzle design ensures perfect curing of the products
- Extremely low condensate accumulation
- Absolutely consistent temperature distribution in longitudinal and transverse direction (+/- 2°C)
- Venturi-Jet-System design ensures thorough mixture of fresh air and recirculation air
- High can stability for all can sizes
KBA-MetalPrint – service and upgrades for existing ovens of any design and manufacturer

Increase the operational availability and productivity of your line

Upgrades

To reduce rising energy costs, we have developed a series of upgrades to make production more cost-effective:

- Quick Purge System
- Short Purge Cycle
- KBA Air Management

Quick Purge System for IBO and pin ovens (KBA patent)

The purpose of the “Quick Purge System” is to minimise the energy consumption for dryers at production start-up and during production breaks (label change, set-up times and stoppages of upstream systems) and to speed up the start procedure in accordance with the safety standards defined by EN 1539.

There are two aspects to the Quick Purge System for belt dryers and pin ovens: Fast oven start-up and an efficient standby mode.

Quick start: To achieve a faster oven start-up, we run the fan at the highest possible rate in order to complete the 5-stage air exchange as quickly as possible. With this system, we are able to reduce the purge time by approx. 30%.

Standby mode: Most of the savings can be achieved by the standby mode. Reduction of the burner and fan power, monitoring of all relevant volumes and provisions to maintain full explosion protection are the most important modifications.

The fans are controlled in accordance with the production status. This is only possible if all fans are equipped with frequency drives. Compliance with EN 1539 not only ensures safe operation of the ovens, but also permits significant energy savings.

Depending on production and frequency of label changes and downtimes, we expect an overall energy saving up to 10%.

A defined period of time is necessary for the system to return to production mode. This must be taken into account by the line management. During production, the exhaust air is monitored in accordance with EN 1539.

The feasibility of conversion must be confirmed by KBA MetalPrint for an individual case.

Short Purge Cycle for dry-off ovens (KBA patent)

The Short Purge Cycle function for dry-off ovens enables energy to be recovered from the exhaust air.

A proportion of the exhaust air is recirculated to the dry-off oven as pre-heated intake air. The consequent increase in relative humidity is countered by a 100% purge via the roof at defined intervals. The use of pre-heated air during the drying process means that energy requirements are reduced significantly.

- Energy recovery from the exhaust air
- Purging of the complete oven in fixed cycles dependent on humidity
- Possible savings between 30 and 100 kWh
- Savings dependent on individual production structure and set-up

Example

<table>
<thead>
<tr>
<th>Process cycle</th>
<th>Temperature range</th>
<th>Energy for heating</th>
<th>Cycle time</th>
<th>Energy consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purge mode</td>
<td>from 25°C to 160°C</td>
<td>44 kWh</td>
<td>5 minutes</td>
<td>3.6 kW</td>
</tr>
<tr>
<td>Save mode</td>
<td>from 160°C to 180°C</td>
<td>6 kWh</td>
<td>55 minutes</td>
<td>5 kW</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Original process</th>
<th>Short Purge Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry-off process temperature</td>
<td>180°C</td>
</tr>
<tr>
<td>Factory ambient temperature</td>
<td>25°C</td>
</tr>
<tr>
<td>Recycle rate</td>
<td>—</td>
</tr>
<tr>
<td>Recycle temperature</td>
<td>—</td>
</tr>
<tr>
<td>Total energy consumption for heating of fresh air per hour</td>
<td>44 kWh</td>
</tr>
<tr>
<td>Savings per hour</td>
<td>Approx. 35.4 kWh —&gt; approx. 3.5 m³/h of gas per zone</td>
</tr>
</tbody>
</table>

Installation example of short purge cycle

The conversion kit is designed and calculated to match the production and process requirements of your particular dry-off oven. To date, we have performed approx. 15 such conversions in Europe.
KBA Air Management System

This system enables energy recovery from the exhaust air (cooler and oven) and keeps the oven air separate from the factory ventilation. The heated exhaust air from the cooling zone is fed as secondary air to the combustion chamber and partially replaces the otherwise cold ambient air, which creates a substantial saving and reduces contamination to a minimum.

When clean exhaust air from zone 3 is supplied to the air recirculation of zone 2, the temperature delta is decreased significantly and the energy required to maintain the temperature is reduced.

Fresh air via combustion air fan. Not adjustable.

Exhaust zone 1

Exhaust out of zone 1

120 °C

Exhaust out of zone 2

180 °C

Exhaust zone 2 and 3

180 °C

Exhaust out of zone 2

180 °C

Exhaust zone 3

200 °C

Cooler

(Up draft)

KBA Air Management System

- The heated exhaust air from the cooling zone is recirculated as pre-heated intake air to an oven zone
- A delta T of about 30 – 40 K compared to the factory ambient air is realistic
- Depending on the composition of the coating, a proportion of the exhaust air can then be fed from zone 2 into the combustion chamber of zone 1
- A gas consumption saving of 12 % is confirmed by customers after a retrofit on a competitor’s ovens.

2-piece shaft gaskets for pin ovens

The gaskets on the pin oven shafts are wearing parts, and if the seal is damaged, the ambient atmosphere comes into contact with hot air from oven. This results in contamination and oven leakages. If this circumstance coincides with over-greasing of the bearings, the excess lubricant represents a flammability risk. The replacement of standard gaskets is costly.

Belt conversion from steel to synthetic belt

Older ovens are equipped with steel belts which is a high maintenance and energy consuming component. State-of-the-art technology is to run the cans on a synthetic belt.

Advantages are:
- Improved can stability reducing spoilage
- Elimination of an energy consumer saving 90 kW per oven
- Higher production rate

Nozzle conversion for internal bake ovens and dry off ovens

By adjusting the geometry of the air delivery nozzles to the can diameter being run on the line allows you the maximal use of the oven tunnel resulting in a higher speed (10 – 15 %) and a lower energy consumption per can. It also reduces the number of fallen cans and so pushing down product outfall significantly, particularly on tall cans with small diameter.

Exchanging the perforated plates in the old washer drying sections for nozzles gives a much better heat transfer with the possibility of reducing the air temperature or increase the belt speed.
Audit – Modernisation – Optimisation

Process efficiency audit
We offer to inspect your existing ovens and on this basis to elaborate recommendations regarding the potential for possible productivity increases by maximising equipment performance and lowering your operating costs.

<table>
<thead>
<tr>
<th>Oven with unadjusted exhaust</th>
<th>Optimised setup reducing exhaust volume by 1000 m³/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust air temperature</td>
<td>180 °C</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>25 °C DeltaT 155 °C</td>
</tr>
<tr>
<td>Air density</td>
<td>0,77 kg/m³</td>
</tr>
<tr>
<td>Heat capacity air</td>
<td>1,02 kJ/kg k</td>
</tr>
<tr>
<td>Exhaust air volume</td>
<td>4000 m³/h</td>
</tr>
<tr>
<td>Mass flow</td>
<td>0,86 kg/s</td>
</tr>
<tr>
<td>Operating hours</td>
<td>8000 h/year</td>
</tr>
<tr>
<td>Energy requirement</td>
<td>135,51 kW</td>
</tr>
<tr>
<td>Energy requirement / year</td>
<td>1084061 kWh</td>
</tr>
<tr>
<td>Gas costs</td>
<td>0,056 €/kWh</td>
</tr>
<tr>
<td>Energy costs</td>
<td>60707 € per year for exhaust</td>
</tr>
</tbody>
</table>

Energy saving with setup change 15 176 € per year

Based on our vast experience in the business, we are able to audit your ovens and provide recommendations for speed increases, upgrades, repairs and spare parts.
Let KBA-MetalPrint be your expert partner, helping you to obtain maximum economic and product quality performance.

KBA-MetalPrint GmbH
Wernerstr. 119-129
70435 Stuttgart, Germany
Phone  +49 711 699 71-0
Fax     +49 711 699 71-670
info@kba-metalprint.de
www.kba-metalprint.com

© KBA-MetalPrint GmbH. Stuttgart. Texts and illustrations refer in part to special features not included in the basic price.
No parts of this publication may be reproduced in any way without the permission of KBA-MetalPrint GmbH or Koenig und Bauer AG.
The manufacturer reserves the right to carry out modifications without prior notice.

Exhaust settings for pin and internal bake ovens
The biggest energy saving is achieved by adjusting the oven exhaust to the minimum flow for safe operation. Most of the ovens are operating with between 2 and 3 times the air volume needed to conform with the EN1539 regulation. Optimisation results in large energy savings.
If you send us your production details, KBA-MetalPrint will be pleased to calculate and predict your potential savings.