Investing in the production of gravure cylinders and embossing rollers

A&R Carton Graz GmbH celebrates its 150th anniversary

Ansgar Wessendorf

Austrian-based A&R Carton Graz GmbH is one of Europe's leading packaging manufacturers for the international tobacco industry. Rising production requirements and dramatic changes on the market in this area have forced A&R Carton to invest extensively in modernising and extending its capacity for manufacturing gravure cylinders and embossing rollers.

In many parts of the packaging sector, A&R Carton Graz is probably better known by its previous names MWV Graz GmbH and Alfred Wall GmbH. Alongside tobacco, which is its biggest business area, accounting for some 75% of sales, the company also makes packaging for chewing gum and textiles. Its customers include leading manufacturers of branded goods in the international tobacco industry and makers of confectionery. "Our team of 430 staff generated record total sales of approximately EUR 100 million in 2017. Our site in Graz spans 58,000 m² and has 36,000 m² of production and logistics space that is kitted out with a wide range of machines and equipment for manufacturing packaging materials," explains managing director Peter Szabó.

The gravure presses at A&R Carton are used exclusively to manufacture cigarette packaging.

Source: Ansgar Wessendorf

Everything in one place

A&R Carton Graz is one of the few companies that covers the entire value added chain in packaging production. That includes working with customers to develop packaging, taking care of prepress (including in-house production of gravure cylinders and offset printing plates), printing the packaging (sheetfed offset and gravure), and undertaking post-press operations such as die cutting, embossing, hot-foil embossing, and window patching. "We also make the formes for our flatbed die-cutting in-house," adds Szabó. "The rotary dies are the only things we buy in, and that's from suppliers we've been working closely with for years." Furthermore, A&R Carton Graz is the only packaging manufacturer operating in the tobacco sector across the whole of Europe that has an in-house gravure cylinder production department.

The longest printing press in Austria

"When it comes to achieving high-quality and consistent results on paper, cardboard, and flexible plastic substrates, the only processes we would consider using are offset and gravure," says Szabó. "The relevant presses are configured in different ways and equipped with a huge range of modules for inline converting operations."

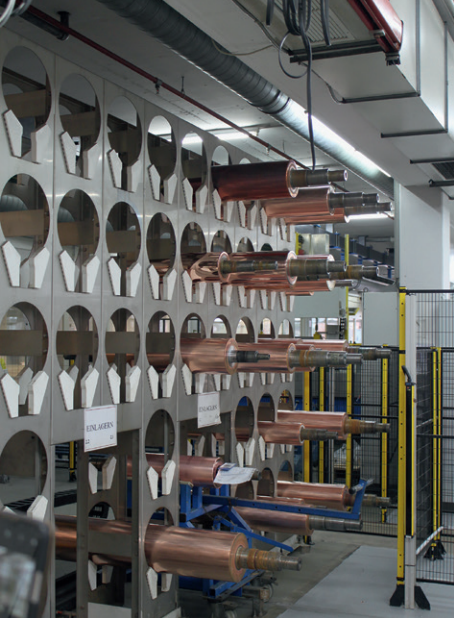
The three gravure presses from Bobst and Cerutti are used exclusively to produce cigarette packaging and are fitted with inline die-cutters (two of which are rotary while the other is a flatbed type). A&R Carton Graz also has four sheetfed offset presses for folding carton production (one Roland, two from Rapida, and a Heidelberg).

A special highlight of the company's machinery and equipment is the longest printing press in Austria. It is a 3B format (700 x 1000 mm/27.56" x 39.37") Speedmaster XL 106-10 dual-coating sheetfed offset press which was commissioned in 2014. Installed on a foundation that is 875 mm (34.45 in) high and incorporating UV equipment, the press has been specially configured for high-quality packaging printing. Thanks to increasingly complex and demanding designs, often very short product lifecycles, ever shrinking batch sizes and, last but not least, the mandatory illustrated warning notices, printing can require up to ten colours.

Postpress work on the printed folding cartons and cigarette packaging takes place on a total of five die cutters from Bobst, three hot-foil embossing systems, and a huge range of folder gluers and window patchers.

Millions invested in gravure cylinder production

The Rotoform department at A&R Carton Graz has brought all its prepress services and cylinder production in-house. Its total of 80 employees are responsible for manufacturing gravure cylinders, embossing formes, and die-cutting formes. The production facilities serve internal customers and pro-



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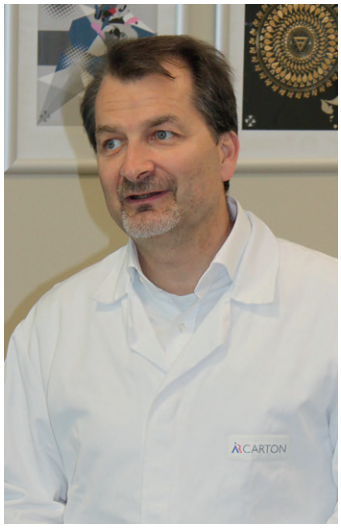


Source: Ansgar Wessendorf

Left: The gravure cylinders are produced on two fully automatic electroplating lines from Kaspar Walter. A cylinder buffer is also integrated.

Right: Arnold Granig, business manager printing formes/rotogravure at A&R Carton Graz

duction sites belonging to the A&R Carton Group as well as external customers that manufacture packaging for the pharmaceutical, confectionery, and dairy industries or produce decorative paper and giftwrap.

"Every year, we manufacture approximately 15,000 gravure cylinders in three-shift operation. About 30% of them are for our own needs and the other 70% are delivered to external customers," explains Arnold Granig, the printing forme and gravure cylinder manager. "Three proofing presses are available to check the quality of the engraved and chrome-plated cylinders. One is equipped with a system for curing UV coatings."

The gravure cylinders are produced on two fully automatic Kaspar Walter electroplating lines. These consist of electroplating baths for copper and chrome plating, degreasing and de-chroming baths, systems for machining copper and chrome surfaces, and laser finishing systems. Three K500 engravers from Hell Gravure Systems are integrated into the first production line. "Both lines are connected by a shuttle system, which gives us even more flexibility when manufacturing gravure cylinders," adds Granig.

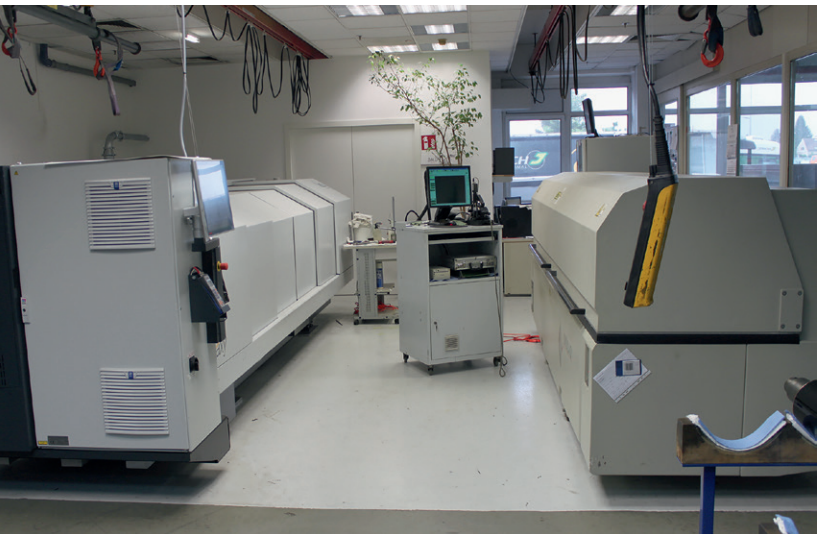
Logistical masterstroke

"In December 2016 the decision was taken to invest some 2.5 million euros in modernising our gravure cylinder and embossing forme production," says Granig, referring to the start of this major project. "We ordered a second Slimline electroplating line from Munich-based Kaspar Walter and the new Cellaxy direct laser from Hell Gravure Systems in Kiel. The conversion and installation work took from January to September 2017. The first step was to dismantle the old Acigraf electroplating systems right down to their foundations, then make the necessary structural changes. The major logistical challenge was to keep cylinder production running during this changeover period. We were working at full capacity at the time and we absolutely had to meet our customers' deadlines," says Granig, recalling the difficult period. "One of the ways we managed was by moving electroplating down to the cellar. We really owe a debt of gratitude to our staff, who showed huge commitment in keeping production up and running, including on weekends and through night shifts."

The baths for the new electroplating line were delivered in May and the Cellaxy in July 2017. "July and August were particularly difficult months for us," says Granig. This was when the new line was installed and the baths that were in the cellar were dismantled and reassembled. Both production lines had to be run in and coordinated with each other. On top of that, there was the Cellaxy system to install, which was adapted to the requirements of A&R Carton in test runs. "Cylinder production was operating at full capacity in September," adds Granig. "The fact we completed this major project to plan and without any delay is also down to the service and support we received from Kaspar Walter and Hell Gravure Systems."

Additional production systems

The laser-etching system from Schepers consists of a 100-Watt Digilas laser, a coating and etching system, the new Cellaxy C500 (600 Watt) and a Schepers laser (250



Source: Ansgar Wessendorf

Watt) for direct engraving in copper. The laser-etching plant is predominantly used for linework and manufacturing special rollers and embossing rollers, while the Schepers direct laser is used to engrave micro-embossing. Two Daetwyler Polishmasters and two CNC machines from Acigraf are used for geometric machining, i.e. turning, grinding, and polishing the surfaces of cylinders and rollers.

Cellaxy – a universal tool

"We have predominantly used the Cellaxy to manufacture embossing formes, but we're making more and more gravure cylinders with the direct laser, too. The first cylinder set was engraved just one week after installation," says Granig. "Thanks to developments in the gradation range, we can also simulate engravings for repeat jobs."

Contour definition and printing density requirements are often equally challenging in the case of high-quality gravure cylinders for flexible packaging, cigarette boxes/cartons, and packaging for the cosmetic and pharmaceutical industries. The Cellaxy is therefore the ideal complement to the HelioKlischograph systems for this job mix.

In comparison, the Cellaxy allows users to adjust the laser's screen definition and write resolution independently of each other. For example, text can be reproduced with very sharp edge definition at a resolution of 2540 dpi and images with a 60 l/cm screen with soft vignettes. What's more, due to its geometry, the laser-engraved cell transfers a large volume of ink. Thanks to these two effects, gravure cylinders lasered using the Cellaxy satisfy exacting demands for both contour definition and high printing density.

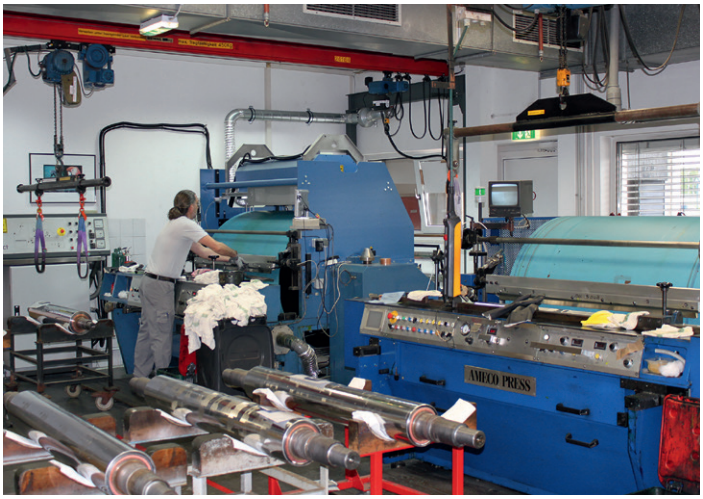
The burn-off generated on the cylinder surface during laser engraving is removed in the Kaspar Walter laser finisher, which is integrated into the new electroplating line. This standardised procedure takes little time and is essential to ensuring perfect chrome adhesion.

The optional embossing module gives the Cellaxy all the features it

The two lasers for the direct engraving of gravure cylinders and embossing formes – Cellaxy on the left and Digilas on the right

Milestones – 150 years of A&R Carton Graz

1868	Banker August Matthey establishes the company
1916	Takeover by pharmacist Alfred Wall
1960s	Industrial gravure printing is introduced
1980s	Large-format offset printing is introduced
1986	The first Bobst Lemanic gravure printing press for cigarette packaging goes into operation
1987	Cylinder and cutting die manufacture begins
1990s	The company expands across Europe – Germany, Poland, Slovenia, UK
2001	Acquisition by Westvaco – then MeadWestvaco MWV in 2002
2014	The company invests in a sheet-fed offset press, the Heidelberg XL 106-10
2015	Acquisition by ÅR Packaging AB
2016	ÅR Packaging AB is bought by CVC
2017	The company invests in printing forme production



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needs to produce 2D and 3D embossing formes and supports fully automatic multi-pass engravings with an engraving depth of up to 1000 micron. Embossing produced in this way can create haptic effects and precise reproductions on both large-area micro-embossing and background textures. In terms of quality, availability, and production speed, the Cellaxy is a highly advantageous alternative production method to conventional milling and laser technologies.

Embossing Disk software is used to parameterise the embossing job and also calculates the data layers needed for the individual engraving passes. It is normally installed on a separate computer and ensures embossing engraving work is prepared to the highest standard possible.

When directly engraving embossing formes, the engraving depths achieved with each pass on the Cellaxy vary depending on the material used. In the case of copper, the engraving depth is around 20 microns. Several engraving passes are required in the multi-pass process to achieve the engraving depths of 150 to 800 microns commonly encountered in embossing. Between the individual passes, both the feed direction and the cylinder's direction of rotation are reversed. The laser's focus position automatically adjusts to the relevant engraving depth and 8-bit greyscale TIFF data is used to control the system. The engraving depth tracks the greyscale data in the image signal with exceptional precision, generating three-dimensional contours in each individual pass.

The Cellaxy Embossing is equipped with a wet chamber that stops burn-off from adhering to the cylinder surface by continuously applying a release agent to this surface throughout the whole laser process.

The pinnacle of folding carton production

High-finish packaging is "in" – and that is particularly true of folding cartons, which are currently in strong demand. Like virtually no other company in the industry, A&R Carton Graz has mastered the cigarette packaging segment - generally regarded as the pinnacle of folding carton production.

The company has so far developed and implemented more than 2500 packaging products for the tobacco industry. This achievement can also be put down to its decision to focus the entire value creation process in-house. That includes packaging development, prepress, tool manufacture (cylinder production, embossing formes, and cutting dies), and a comprehensive selection of machinery and equipment for printing and finishing. "We want to meet the growing demand for high-quality packaging by investing in state-of-the-art equipment, such as the new Cellaxy direct laser and the new electroplating line," explains Szabó. "The fact we produce gravure cylinders for so many package print shops shows that our strategy is on course. Numerous awards are further evidence, such as the German Packaging Award 2016 and 2017, the Pro Carton 'Carton of the Year 2016' award, and the German Design Award 2018."

Source: Ansgar Wessendorf

Left: Three proofing presses are available to check the quality of the engraved and chrome-plated cylinders. One is equipped with a system for curing UV coatings.

Right: Thousands of gravure cylinders in storage at A&R Carton Graz.