Gravure package printing under pressure

Above the roofs of Graz/A, ERA European Rotogravure Association presented their 2011 »Packaging Gravure Awards«

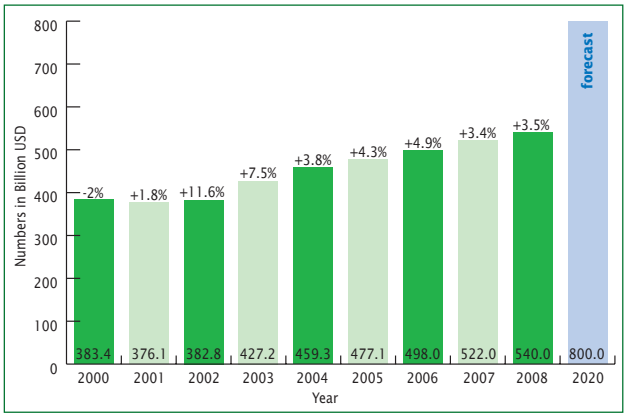
Ansgar Wessendorf

Last November, the European Rotogravrue Association held its annual, two-day Packaging Conference in Graz, Austria's second-biggest city and hometown of Arnold Schwarzenegger. Under the motto »The future of gravure printing in the booming packaging markets« a total of 15 presentations covered a broad variety of topics. Not exclusively addressing gravure package printing they also provided indepth views into other topics which enabled the 110 attendees to draw personal conclusions about the future viability of gravure package printing. However, in addition to technical solutions and developments the focus was on self-marketing and public image.

ERA Innovation Award

The highly prestigious bi-annual »Packaging Gravure Award« may be considered a good indicator of performance and innovation strength of the European gravure package printing industry. In addition to the five prizes awarded in six categories, eight »Special Commendations« were handed out. Again the »Innovation Awards« aroused the highest interest from the audience. Both awards from this category went to Italian companies. Perched on a mountain and residing over the city, the »Schlossberg« restaurant offered the festive frame for the Awards dinner.

Continuous growth of the packaging market. Source: Pira International; Courtesy of Windmöller & Hölscher.



The Lainate near Milan/I-based package printer *Rotoprint Sovrastampa* has won an award for its patented register-accurate overprinting or imprinting process for pre-printed web-based flexible packaging materials such as Polyester, Polypropylene, paper, or self-adhesive labels.

This process is used to change information concerning price, weight, best-before dates, company names and personalisations, and to support promotional activities. *Rotoprint Sovrastampa* has gained a USP among package printer by perfecting and focussing on this process. This service is much appreciated by global brand owners to »save« misprinted reels, and to save the costs for new production from scratch.

The second »Innovation Award« went to *Cerutti SpA* for its *R1060* gravure package printing line, which was honoured for to its convincing flexible concept. Efficient dryers facilitate faster drying of the applied ink film and thus contribute to lower solvent retention. Furthermore, the shorter drying hood allows a shorter web path which subsequently reduces waste. Sturdy doctor blades and a rubber roller improve the inking of the gravure printing cylinder at high production speeds, whereas a sophisticated trolley system reduces times required for job changes.

Influencing factors and symbiosis

Dr Helen Karmasin (*Karmasin Motivforschung*) opened the presentations with a lecture on »Sociocultural influencing factors on packaging«. The symbiosis of product and packaging has to create consumer identity and transport messages. Each packaging has a respective colour and form code appealing to a certain clientele, industry, or group of persons (i.e. »masculine« or »feminine«, respectively »meditative« packaging for people with interest in yoga). Other huge influences on packaging design are current trends (i.e. organic) or social changes. The increasing number of single-person households, the rising number of elderly people, and the high mobility increases the demand for small size convenience packaging (»packaging-to-go«).

Growth market Southeast Europe

While the global packaging market compromised USD 383 billion in 2000, it increased to USD 540 billion in 2008 and is forecast to reach USD 800 billion by 2020. In 2008 the consumption of packaging materials in Western Europe was USD 338 per capita, in North America USD 383, and in Eastern Europe USD 108. According to Bagdan Breazu (*ISM*) these numbers impressively illustrate the growth potential of Western Europe-based packaging producers on markets in Eastern Europe and especially Southeast Europe.

With 21.5 million inhabitants, Romania is by far the most populated country in this region. In this country, flexographic printing of flexible substrates has a market

share of 66%, while the share of gravure printing is at a low of 7%. Approx. 27% of flexible substrates remain unprinted.

Straight talk and criticism

The capacities of *Constantia Flexibles* Austrian sites – *Constantia Teich* in Mühlhofen and *Constantia Platz* in Loipersbach – are designed for the annual production of 15 billion platines (joghurt lids). »Two thirds of the platines are flexo printed (6% solvent-based inks, 60% UV inks) and one third is gravure printed«. Flexo is mainly used for shorter job runs; 79% of the jobs are shorter than 9000 sqm (96,876 sqft) which adds up to 48% of the total production. Compared to this, 14% of jobs printed with gravure totals 50% of the total production, whereby 60% of the jobs are smaller than 9000 sqm (96,876 sqft). This means a share of just 19% of the total production.

Due to the ongoing trend to smaller print runs, *Constantia* puts high emphasis on reducing time required for job changes. To achieve this goal shorter reaction times are essential. In this regard, gravure is outmatched by flexo printing by far. Whilst gravure cylinders have an average delivery time of five days, flexo printing formes are available within 24 hours. According to Harald Huber (*Constantia Flexibles*) the costs for a photopolymer flexo plate are approximately 49% below a gravure printing cylinder. This example is based on printing formes with a printing repeat of 450–500 mm (17.7”–19.7”) and a printing width of 600 mm (23.6”). Gravure printing forme production is a complex process, requiring much effort to keep production steps stable and accurate (mechanical preparation, electroplating, surface treatment, engraving). Also transport, handling and logistics of heavy forme cylinders are difficult. As a general rule, gravure printing cylinders are designed for one specific press, they can’t be used in different printing presses. Availability and price trends of Steel, Copper, and Chrome and controversial issues about the metal Chrome cause uncertainties within the industry.

Against this background, Harald Huber draws three essential conclusions: As in flexo printing, to reduce makeready times and ease cylinder handling a lightweight, sleeve-based printing cylinder with a press-specific mandrel must be available for gravure printing. Feasible solutions include gravure printing sleeves (supplied by *Saueressig*) or lightweight standard size gravure printing cylinders (supplied by *Bolz*). However, the disadvantage of such solutions is the low number of respective suppliers and a lack of compatibility of such closed-loop systems.

He also demands the development of an alternative direct laser engravable mono-layer to reduce the number of process steps in electroplating and surface treatment. Unfortunately, a functional layer, offering the engraving characteristics of Copper and Zinc combined with the excellent print characteristics of Chrome, is still not available on the market.

Research by *IPT* on Nickel or solutions by *Schepers* and *Hell Gravure Systems* for direct laser engraving in Copper might be regarded as the first steps in the right direction.

Huber considers radiation curing ink systems as viable alternatives to water- and solvent-based inks. UV and EB inks consist of 100% solids and require low cell volumes. Another benefit of radiation curing compared to solvent-based inks is a shorter web path resulting from eliminating the drying hood. Furthermore, there is no need for ex-protection zones and air purification systems. Moreover, UV cured ink layers are characterised by high gloss and extraordinary chemical and mechanical properties.

Per capita (USD)	Region	Population (Million)
338	West Europe	400
383	North America	380
108	East Europe	330
38	Latin America	580
43	Asia/Pacific*	3800
31	Africa/Middle East	1190

** Japan: 450 USD per capita*

Packaging materials consumption (2008). Source: Pira International; with courtesy of Windmöller & Hölscher.

Concluding his presentation, Harald Huber addressed some criticism towards *ERA*, as in his opinion the association should be a lot more visible on the market and put more effort into promoting possibilities and benefits of gravure package printing. As positive examples he mentioned activities of the German Flexo Technical Association (*DFTA*) like seminars and training courses. In addition, flexo suppliers are currently launching numerous innovations onto the market. Naming only a few, solutions like *HD-Flexo*, *LuX*, *NExT*, *Flexcel*, or direct engraving into Elastomer (undercut) are all pointing in the same direction of making reproducible high resolution flexo formes with high print run stability. The high potential of flexo printing is already recognised by companies like *Fujifilm* and *ContiTech*, which are traditionally suppliers to the offset printing industry.

REACH: Chromium trioxide

Josef Bernard (*ERA*) referred to the current state of the ongoing registration process of Chromium trioxide according to REACH. There is no doubt that Chromium trioxide is a hazardous and toxic chemical substance, and that its REACH listing

The ERA Packaging Conference took place in the impressive conference room of the Minorite Convent at Graz/A.

was reasonable and inevitable from a scientific point of view. Not only the gravure printing industry, but also other important industries like automobile and aerospace depend on Chromium trioxide. *ERA* is negotiating with the competent EU authority on an authorisation of Chromium trioxide for gravure printing under controlled conditions. *ERA* also has constant exchanges with other industries.

Simple and effective counterfeit protection

Integrating *Cryptoglyph* technology into package manufacturing results in counterfeit protection of products. According to Roland Meylan (*AlpVision*), using *Cryptoglyph* microdots invisible security elements can be applied with inks or varnishes by using flexo or gravure technology and thus is easy to integrate into the production process. To differentiate original products from counterfeits a photo taken with a mobile phone or a scan is sufficient. The image has to be transferred to a secure server via the world wide web or mobile phone network. This server detects, analyses and decodes the *Cryptoglyph* marking and sends a text message to the mobile phone whether the product is an original or not. This solution enables field service inspectors to check pharmaceutical and chemical products in shops to identify grey marketeers and fraudulent re-imports.

Slowly but steadily

During the conference, the manager of a highly reputed package printer with a repro department admitted his initial refusal against using *PaC.Space*, but would not miss it since its implementation. The idea of *PaC.Space* is to provide a general gravure packaging colour gamut, to achieve a defined interface of supplied data to specific process and printing conditions. In his presentation, Lothar Roth described in detail the pros and cons of *PaC.Space*, admitting that there is still much work to do to convince the market. After seminars with brand owners and agencies in 2010, workshops had been held at print and media universities and engineering schools in 2011 with more to follow in 2012. *Packaging & Label Gravure Association* (USA) features *PaC.Space* in its handbook »PLGA Global Gravure Specifications & Tolerances«.

Region	2004 (1000 to)	2010 (1000 to)	Growth 2007–2010 (% p.a.)
USA	3000	3600	3.1
Canada	450	550	3.4
Europe	3534	4528	4.2
Asia/Pacific	2400	2750	2.3
China	1000	1700	9.2
India	300	600	12.2
South America	1100	1650	7.0
Others	600	740	3.6
Total	**12,384**	**16,118**	**4.5**

Flexible packaging: Consumption and growth Source: Pira International; courtesy of Windmöller & Hölscher.

Intelligent management systems

Next-generation artwork management systems were the topic of Bertin Sorgenfrey's (*Dalim Software*) presentation. Advanced modular software solutions for information exchange and approval via the internet, tailored to customer requirements and environment, enables an increasing number of prepress serv-

Winners of the ERA »Packaging Gravure Award« 2011

Films and Laminates

Award
»Nua Juicy Fruit Candies«, Ukrplastic/UA

Award
»Stater Bros. Extra Juicy Shrimp«
Print Master Co Ltd/TH

Special Commendation
»Kraft Food Alpengold«
Huhtamaki Deutschland GmbH & Co.

Shrink-wrap Sleeves

Special Commendation
»Christian Audigier Vodka«, Sleever International/F

Paper/Film Laminates and Metallised Films

Award
»Beyers Koffie Authentics«
A. Hatzopoulus SA/GR

Special Commendation
»Unox Snelle Knaks«
Huhtamaki Deutschland GmbH & Co.

ice suppliers to speed up their complex processes. Such management systems have become an inevitable tool for communication, proof and approval. Depending on administrative authorisation, users can look at, check, edit and approve every document – location-independent and without downloading the file.

An additional challenge is the integration of several prepress solutions and workflows and planning, accountancy, and organising software and databases, all purchased bit-by-bit from different suppliers. This leads to inefficiency, mistakes and waste, since such products are not designed to communicate with each other. In the meantime, software solutions are available that are designed to bridge these communication problems at reasonable costs and with relatively small effort.

Expanding the portfolio

As global leader in the manufacturing of presses for illustration gravure and newspaper flexo printing, *Cerutti* has been particularly affected by the recent global financial crisis and the change in media landscape. Italo Busto stated that despite the situation those segments are still important for the company, *Cerutti* has shifted their focus even more to the prospering packaging market. In addition to *Flexotecnica*'s (a member of the group) gravure and flexo lines for package printing, *Cerutti* expands their product portfolio with lacquering and laminating lines for high-quality applications. This decision has already caused positive effects with the first installations of such devices (Flexo & Gravure Int'l 1-2011, p 70).

New old companies

Eric Serenius explained the reasons for renaming the former *Daetwyler R&D Corp* to *Ohio Gravure Technologies Inc.* Founded in 1978 as *Ohio Electronic Engravers*, in the succeeding 20 years the Miamisburg, OH/USA-headquartered company sold more than 800 engraving lines for gravure package printing formes production. In 2000 *Ohio* was integrated into *Max Daetwyler AG* as *Max Daetwyler Corporation Dayton Division*. Being the sixth company in the *Heliograph Holding*, *Ohio Gravure Technologies* will be the centre of excellence for printed electronics and devices for gravure package printing. Manufacturing of *Ohio* engraving lines will be completely outsourced from *Daetwyler Graphics*/CH to Miamisburg. In this context, Eric Serenius mentioned the engraving line *Gravostar Spectrum*, the latest product by *Ohio*. With regard to performance, this line is equal to *Hell Gravure System*'s *K 50*.

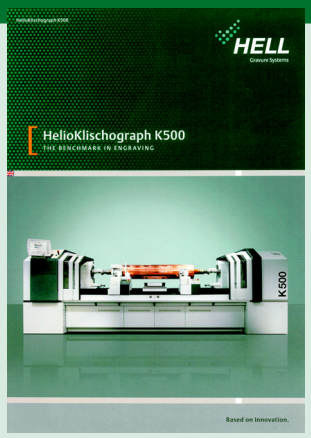
Christopher Graf introduced the North American company *Hybrid Software*, which recently founded its European subsidiary. As CEO Germany he is responsible for building up business activities in the German speaking world. *Hybrid Software* offers software solutions for automating and integration of systems, workflows, and modules for the graphic industry.

And what about flexo?

Even though Stephan Riechert (*DuPont*), didn't express it directly: *Cyrel FAST round* for solvent-less thermal processing of photopolymer sleeves can be classified as a

Innovation Prize

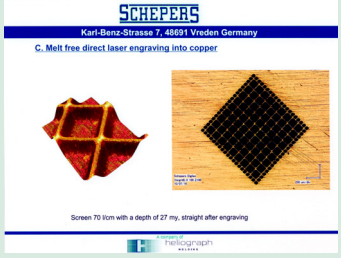
Award
»Packaging Gravure Press R1060«
Cerutti Packaging Equipment SpA/I



Special Commendation
»K500 Twain: Electro mechanical engraving of gravure cylinders with two engraving heads«
Hell Gravure Systems GmbH/D

Award
»Overprinting or imprinting of pre-printed web-based packaging materials«
Rotoprint Sovrastampa Srl/I

Special Commendation
»Melt-free direct engraving in Copper«
Schepers GmbH & Co. KG/D

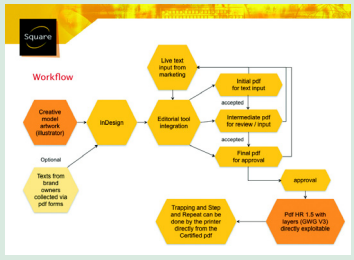


Special Commendation »Best Newcomer« entry

»Gut von Holstein Käsescheiben«
Wipak Walsrode GmbH & Co. KG/D

»Stater Bros. Extra Juicy Shrimp«
Print Master Co Ltd/TH

Workflow Prize (Standard Dataformat)



true challenge to gravure package printing. This barely pollutive technology enables the production of continuous images and complex multiple images, up to now a traditional domain of gravure printing. The lightweight flexo sleeves are easy to handle, which significantly contributes to reducing makeready times on CI flexo presses and achieve high register accuracy. Furthermore, *EskoArtwork*'s *HD Flexo* opens up new opportunities in terms of print run, stable fine screens and solid areas, raising flexo to the quality level of gravure printing.

Cylinder inspection: an alternative to proofing?

Udi Zohar (*PSik Solutions*) characterised gravure printing forme production as a not fully automated process. This is due to the fact, that proof printing as a crucial factor in gravure cylinder quality management is an isolated process step which cannot be integrated into the automated engraving line. Proof printing is a laborious and costly procedure. Another drawback is that proofing is the final process step and therefore incorrectly produced cylinders will be detected only at a very late stage of production. To overcome this problem, a module has to be developed which can be integrated and that detects and localises defects at a very earlier stage of production. He illustrated how such a module may look. It is based on the capability to expose the rotating cylinder surface with a high-resolution camera (7–10 micron) and to store the image as a Tiff file. Subsequently, the file is compared and checked with a digital master stored in the system. In addition, the data can be used for digital proofing. It is intended to introduce the module to the market both as a standalone version and an integrated element for fully automated cylinder engraving. Zohar is looking for competent partners to realise this project.

Direct laser engraving

By means of many microscope images, Hans-Georg Schepers (*Schepers*) illustrated the broad variety of possibilities for melt-free direct laser engraving offered by the *Digilas Direct* system. In addition, it can be used for the direct structuring of many different surface materials such as Steel, Aluminium, and Ceramics (Flexo & Gravure Int'l 1-2011, p 60).

Still a lot left to do

Day 1 of the conference saw 15 presentations in total, held in the large conference room of the Minorite Convent in Graz/A, whose pompously designed frescos on walls and ceilings and the representative stairway strongly impressed the attendees. The large number of highly informative presentations required the attendee's maximum concentration and attention. This resulted in a shortage of time for forum discussions and also for networking and shop talk during the breaks.

Many attendees indicated their preference to common topics for presentations, as this would offer the chance for more indepth treatment of the respective subjects.

Furthermore, critical voices demanded better marketing of gravure package printing. However, in this context one should mention the modular character of the longterm *DFTA* marketing concept and its step-by-step implementation. For its elaboration, the flexo association contracted a professional agency, which was financed by a massive increase of the membership fee in 2008. Such a massive project requires considerable dedication and lots of effort by the members.

On the other hand, the *PaC. Space* initiative, lobbyism for Chromium trioxide, or the organisation of gravure printing seminars in cooperation with the Media University (*HdM*) of Stuttgart/D are striking examples of *ERA* activities to promote gravure package printing. *Rotomec* is installing a state-of-the-art gravure printing line at *HdM*, which offers the industry new possibilities in education, research and development. However, it is still rewarding to deliberate about how to promote such activities in a better and more effective way.

Since job sizes are shrinking, the amount of jobs fulfilled by a gravure package printing press per shift is increasing which also increases makeready efforts. High availability and easy handling of gravure printing formes is mandatory for fast job changes. Although gravure printing sleeves and lightweight cylinders are certainly offered, the number of suppliers is still much too small. The development of a direct laser engraveable monolayer, which would be a viable alternative to established electroplating and finishing process, and also lower costs and provisioning time required for forme production is an ever recurring object. A promising approach to tackle such issues was made by Stuttgart/D-based company *IPT* through developing a Nickel monolayer. Also standardising construction and measures of printing formes has to be considered. It is obvious that there is still much to do to exploit the full potential of gravure package printing.

➜ *www.era.eu.org*

Figure 5:
A most harmonious team proved over the years: The hosts James Siever (ERA General Secretary) and Wolfgang Klos-Geiger (Publisher of Flexo & Gravure Global, Packaging-Films and Flexo+Tief-Druck).

On Day 2 the *ERA Conference* delegates visited *Alfred Wall GmbH*, based in Graz. The company provided interesting insights into its full-stage packaging production, from prepress to print and converting. Their portfolio comprises folding boxes and blanks for the food, confectionary and tobacco industries. Among the customers are internationally known branded companies such as *British American Tobacco*, *Storck*, *Triumph International*, *Reemtsma*, *Philip Morris*, *Nestlé* and *Mars*. Founded in 1868, the company currently employs a workforce of 400 at a production area of 38,600 sqm (415,490 sqft).

For printing on paper and board, three offset and three gravure printing presses, four die-cutters, and two foil hot stamping lines are in use. Gravure cylinders are produced on the fully automated *Autocon* line with two integrated *K500* engraving devices from *Hell Gravure Systems*. A *Schepers* laser ablating and etching device is used for special cylinders (i.e. for the tobacco industry). In total, the company produces approximately 12,000 gravure cylinders per year for customers and for their own use.

Alfred Wall GmbH is part of the globally positioned *MeadWestVaco* (*MWV*) *Corporation*, which generates about three quarters of their USD 6 billion revenues with packaging. *MWV* draws on a 150 year history and considers themselve a comprehensive supplier of packaging solutions. Headquartered in Richmond, VA/USA, the corporation employs 17,500 staff in 30 countries and holds 4000 patents.