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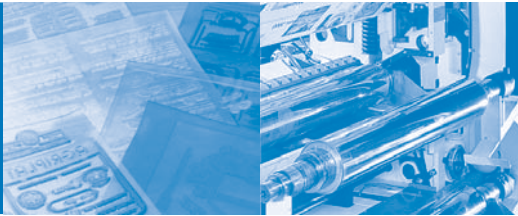
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# Flexo Gravure Int'l

Leading Technical Magazine for the  
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Package Printing and Converting Industries







# The importance of flexo and gravure to packaging producers

*The competition between rotogravure and flexography – a survey of the economics, quality, trends and customer reactions*

STEFAN BEILENHOF

*Flexo and gravure have had to deal with the daily competition between the two processes for many years, especially in the flexible packaging market and have had to compete for the support of branded goods manufacturers. In the context of technical developments and advancements, flexography is by far the more dynamic process. But what is this competition really about and what about the theory that both processes can complement each others strengths to meet market demands in a much stronger way?*

Flexo and gravure purists will always prefer their own process and be able to justify their decision on which one to use to print on flexible materials. It will be interesting to see how packaging producers using both processes evaluate them both.

Retailers have re-evaluated the importance of their store brands against branded goods in the past two years. This has led inevitably to higher quality requirements for packaging.

To packaging producers there is no significant difference between the demand for quality of branded goods and store brands. Who determines the choice of printing process? What options has the printer got? What are the economics?

A market survey carried out by the *Gesellschaft für Konsumforschung (GfK)* in 2006 on behalf of the *European Rotogravure Association (ERA)* outlines the attitude of branded goods companies. According to the survey, gravure enjoys an excellent reputation because of its brilliant reproduction and high quality levels on long runs. Another conclusion was that flexo will never provide gravure like

quality and that eight out of ten branded goods companies prefer gravure printing. This leading position is backed up by an excellent lobby by the branded goods companies.

Can gravure rest on its laurels? It is a fact that flexo has gained ground because of its significant increase in quality in the recent past and the excellent progress in press developments and printing plates. Gravure is well advised to recognise this situation and not rely on their strong position for ever.

The progress made by flexo has a price to pay and to penetrate the high quality markets generally served by gravure printers could threaten flexo's current advantages.

## Global competition

While the »Battle of the Processes« seems to have been decided in the Eastern and Western hemispheres, a stalemate has been reached in the past few years in Europe. Flexography has an 80:20 ratio market share in the USA with just the opposite in Asia. This is possibly due to the lower quality standards of the end-

customer and the branded goods companies. This turned gravure into a niche process used mainly for tobacco and pharmaceutical packaging. The driving forces in Asia are not only the demand for high quality packaging with fancy finishing using metallic pigments and effects colours, but also the use of smaller and less complex printing presses, narrow cylinder widths and small and cheap cylinder manufacturers.

Print shops and larger producers of cylinders benefit from the know-how, goods and economic lines and minimal labour costs. Production costs are a lot lower than they are in Europe because either environmental regulations do not exist or are not enforced. Despite the fact that Toluol-based inks are common solvent recycling by distillation or burning are not common. The simplicity of gravure printing has enabled the process to enjoy an eighty percent share of the market.

## Cylinder costs

A high-quality gravure cylinder costs EUR 200, in Asia with unchromed cylinders for shorter runs even less. In the USA a similar cylinder would cost EUR 800 which is in line with the level in Europe 15 years ago. The price is controlled by the market economics of supply and demand. Effective competition leads to cylinder costs of around EUR 550 in Central Europe and even down to EUR 350 in the southern part of Europe.

## The new market survey

Research into the economic and qualitative strengths of flexo and gravure, trends and the influence of customers on decisions were the fundamental principles on which the market survey was based which was carried out by *print.con-Beilenhoff Consulting* in 2009. The results were presented for the first time at the *Innoform International Conference* under the title »Flexo

printed film packaging; Focus: Repeat accuracy» in November 2009.

● *The companies surveyed.* The basic materials of this study were statements from managers and owners of prestigious packaging printers from Germany and Austria relating to the economic and qualitative importance of flexography and gravure. The companies chosen were medium-sized with approximately 100 employees also sites where market leaders employ several hundred people. Because a considerable part of the survey's focus was based on the interviewees neutrality to both processes, only companies using both flexo and gravure were interviewed.

● *Machinery.* A comparative index to monitor performance was the size of the machinery used. On average 2.6 gravure printing presses with 21 printing units were used, and 9.2 of the larger presses. The numbers for solvent based flexo were 3 presses with 23 units and 8.3 for the larger presses. 2.5 presses with 21.5 units and 8.5 units on the larger presses were used for UV flexo. These are all average values.

● *Investment behaviour.* The survey also covered the investment intentions of the surveyed companies in order to discover their technical level and economic orientation.

In general those polled were keen to invest in printing presses. Their focus for the past few years has been on gravure presses but in the future they have indicated that they will seriously consider flexo presses. More than three-quarters have invested in a new gravure press in the past three years and more than half in a new flexo press. About 50% plan to invest in their flexographic department with a balanced ratio between replacement investment and a capacity increase. No equivalent statements were received for gravure presses.

● *Product segments, markets and customer attitudes.* Revenue distribution of branded goods and retailers shows significant variations. The ratio of production whether direct or indirect is 60:40 retailers to branded goods companies. It is however significant that both customer groups have a similar choice pattern. The customer chooses the

printing process on 60% of the jobs, the printer decides in all other cases. This averages out to a 50% share for each process. *Figure 1* supports the broad range of products supplied by the companies interviewed.

● *Cost before printing.* These costs are particularly critical with the trend to shorter press runs. According to the survey customers pay for 80% of the preproduction costs for gravure printing while in flexo they pay for only 75%. The remainder is generated by the actual print run. The slightly higher costs which customers will pay for gravure suggests that it is important for the customer that gravure is used. In view of the 154% higher preproduction costs for gravure compared to polymer plates this amount of cost sharing is very necessary. It is remarkable that the costs for a continuous polymer printing forme are only 13% lower (than a gravure cylinder) and a rubber forme only 10% lower. These figures explain why photopolymer plates are the most popular technology with a share of 86%.

● *Development of job size.* Contrary to popular belief gravure printing is no longer seen as a long-run process. If this was true it would be the end of gravure considering that run lengths are decreasing. The average run length for flexo was 14,200 m (46,588 ft) however two companies confirmed that they use flexo for very long runs. By comparison the average gravure job is 28,000 metres (91,864 ft) which underlines the necessity for economic short runs. A trend during 2008 showed an increase in run lengths compared to previous years. *Figure 2* shows the progress of run lengths between 2006 and 2008.

● *Economic and quality position.* Against the background that with 40% of the jobs the printer chooses or suggests the process it is important that their views are put forward. To support this discussion it is important that the data is analysed with regard to economic criteria. Flexography is used as a reference at 100%.

This data includes output per hour minus machine stops which justifies the higher price demanded for gravure. A weak point is still the make ready waste, material costs and cleaning up. Although these

weak areas should be an incentive to suppliers to continue to develop it seems that there is a shortage of viable arguments to influence companies investment decisions. However the printer's opinion of gravure and the quality achievable could be its salvation (*figure 4*).

The quality level which gravure can achieve supports the reasons why it should be used for high quality package printing. The main advantages are the smooth vignettes and consistent quality throughout the print run. Other characteristics mentioned included colour brilliance, quality of the white printer, repeat accuracy and colour quantity.

● *The opinion of the packaging producers.* Sixty percent of the packaging producers could not differentiate in productivity between gravure and flexo. While printers rate flexo highly the layman still believes that gravure has the better reputation. Many printers admitted that the difference in quality between flexo and gravure is not anywhere as great as it was and that non-experts would have great difficulty in recognising the difference. With regard to productivity 40% favour flexo. In the opinion of the companies taking part in the survey there is a balanced relationship be-

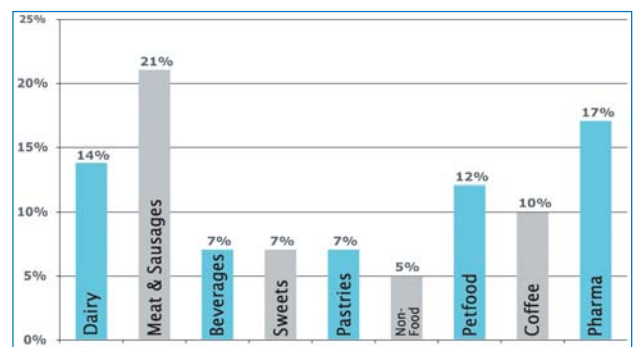


Figure 1: Product segments and markets.

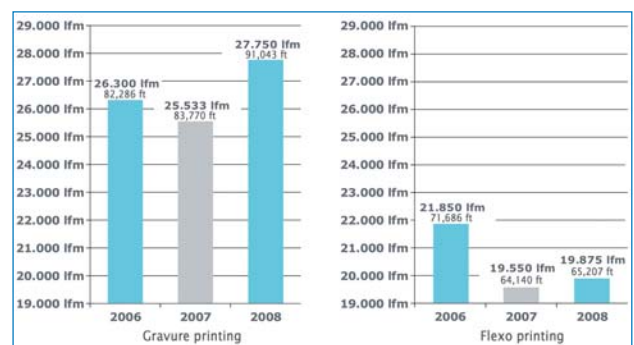


Figure 2: Run length development 2006-2008.

tween flexo and gravure so their current market share will not change significantly in the near future.

● **Results and outlook for gravure printing.** The market is influenced by many factors which means it is difficult to provide an accurate forecast. Gravure printing benefits from the increased quality demands of the branded goods retailer. On the other hand flexo's increased quality and better economic situation are its strengths. In order to convince customers which process to use and thereby maintain market share it is important that the arguments are continuously put forward.

If the preproduction costs for a flexo continuous forme increases to the level of gravure this will destroy one of flexo's biggest advantages. This will be especially true if the gravure printing industry addresses its weak points and improves considerably. If the performance of the two processes becomes nearly equal then the higher and more consistent quality levels will not be a sufficient argument anymore. However costs will become the main discussion point.

● **Competing with flexo.** Because flexography has increased its quality and productivity levels by automating their processes using modern printing formes, the only way gravure can gain any advantages are by continually reviewing their technical position or by retrofitting existing presses. This means that the weak points must be identified and addressed on an urgent basis.

The survey highlighted the weaknesses in gravure most of which are already well known including investment costs (steel core cylinders), prepress costs, delivery times, cylinder handling and storage, make ready costs, set up waste and cleaning up.

Some actions to meet these issues have already been taken and are indicated below.

● **Steel core cylinders.** These are heavy to store and expensive from a purchasing and logistic point of view. This is in part caused by the wide variety of types and face widths of the steel cores which limits their interchangeability between the various presses and companies. This is also the reason why a used

cylinder pool to reduce printing forme costs never really took off. Over the years a gravure printing press uses approximately 3500 cylinders which means a considerable amount of capital is tied up. Even more, at least 25% of the cylinders lie idle or the circumferences have to be changed which is expensive as they no longer meet the current formats. Another consideration is that the storage of the heavy 100 kg cylinders and the inhouse logistics required to control them is a cost factor not encountered by flexo.

Many cylinder manufacturers have addressed this problem. Nickel-Copper hollow cylinders on air mandrels, hollow cylinders made of a steel/PU foam composition with an expanding shaft and hollow Aluminium cylinders or in a sandwich construction compete with steel cylinders. The willingness to invest in developing technologies such as *Starbase* (Daetwyler), *Gelenium*-hollow cylinders (*Saueressig*) or *Cylight* (*Janoschka*) emphasises just how serious the industry is to replace steel cylinders.

The two systems which appear to be well established are those from *Saueressig* and *Janoschka*. The *Gelenium* has about 18,000 cylinders currently in use, this considers to be a lower cost system providing a

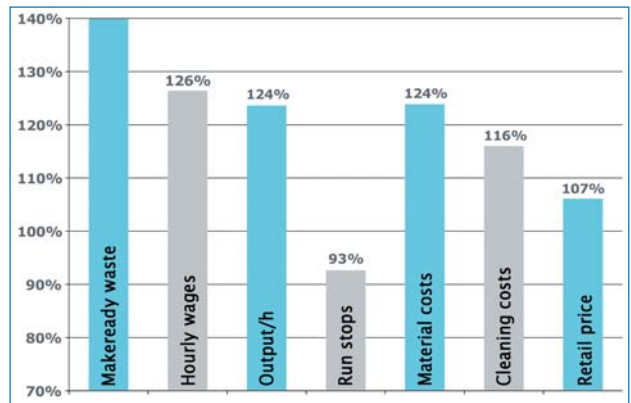


Figure 3: Economic efficiency - gravure vs flexo (flexo = 100%).

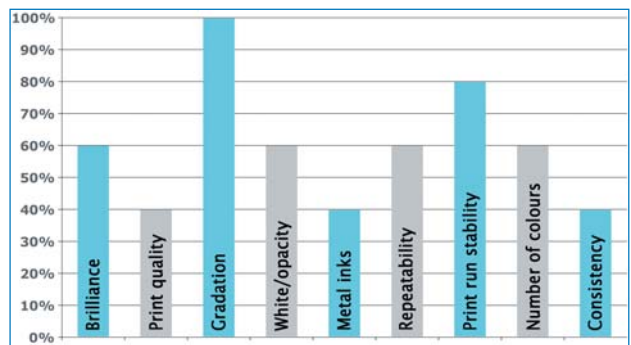


Figure 4: Quality - Gravure's advantage.

more economic and logistically acceptable cylinder change operation. With the correct cylinder changing device it can be adapted to almost any gravure press.

*Cylight* is mainly used in the classical hollow cylinder markets of

## Profile of print.con - Beilenhoff Consulting

Since May 2009 STEFAN BEILENHOF, owner of *print.con Beilenhoff Consulting*, has been a self-employed consultant to the print and packaging industries. He offers consultancy, training and project management to his customers (mainly packaging producers, branded goods companies and retailers). His field of activities includes prepress, colour management, several printing processes, print and prepress standardisation, printing forme cylinder and impression roller production, process development, workflow organisation and productivity management.

STEFAN BEILENHOF studied printing techniques at Bergische University in Wuppertal. He worked as Project and Sales Engineer and was in charge of development and marketing for *Saueressig GmbH* (1997-2001). From 2002 he was Division Manager with responsibility for the Business unit »Packaging«. He also was responsible for the interim management of *Druck-Service Goerz GmbH*. In addition to his responsibilities at the head office he also worked on development, technology and standardisation which resulted in several processes, products and lines introduced to the market which were achieved in joint and close co-operation with several international and customers and project partners. His focus is mainly on workflow organisation (internal and cross-company borders), standardisation (colour management/design to press), tools (special printing formes, coating, impression) and press engineering (i.e. gravure printing presses with integrated sleeve change).

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Spain and France. Because of its design the system is only recommended for face widths up to 1000 mm (39.4") which meets the requirements of the majority of the presses in Southern Europe. Because of its reduced logistic, storage and handling costs more than 20,000 *Cylight* cylinders are already in use. The system is usually used on hollow cylinder presses with an appropriate pick up system or onto a shaft cylinder.

Both *Saueressig* and *Janoschka* continually co-operate with leading press manufacturers to advance these systems and guarantee the printer optimised integration of them.

● *Setup costs, delivery time.* In addition to the dramatic reduction in the time for printing forme change and the easier handling compared to steel cylinders leading printing forme producers concentrate on colour management and optimising setup times. This has a positive effect on the speed of the prepress workflow, approval cycle and a reduction in makeready waste and residual inks. The result is a satisfied customer because the printed result closely matches the approved proof avoiding considerable quality control involvement. This used in tandem with a new, transportable colour mixing facility enables an exact formulation to be achieved, which is a tangible and forward looking progress. To ensure that all these advantages are offered to printers a standard is necessary to make the ink formulation applicable to all cylinder manufacturers. This can be construed as a wake up

call to manufacturers and associations alike.

● *Printing presses.* The pressure is on press manufacturers to reduce setup costs and waste management. They are focussing on developing pre-register settings and register control systems as integral and proprietary solutions which can be offered as features on their presses. This system offers the principle of »All from one source« which promises register accuracy after only one rotation respective to the web length with a deviation of less than 70 micron.

Press manufacturers are also working on enhancements to web length. Printers owning a CI press will not be impressed with the numbers mentioned in this article but a ten-colour gravure press with a web length of 48 m (157.5 ft) is a significant step in the right direction.

Joint efforts between ink, press and printing forme manufacturers could bring the benefits of a chambered doctor blade system to gravure one day. Wash-up processes on press and externally do not have an influence on costs and efforts for cleaning. Generally a chambered doctor blade system is considered to be applicable to gravure but it will take time for this »innovation« to be accepted as a mature part of the process.

**Outlook**

In spite of the fact that the survey found a small increase in run lengths between 2006 and 2008, the figures are well below the time when printing widths were increas-

ing. While some companies print successfully using small face widths the average printing width in recent years (in German speaking countries) is more than 1100 mm (43.3").

However the interest in narrower web gravure presses is growing. But what are the practical benefits of using these presses? The significant cost disadvantages for flexo are related to the initial cost, hourly rates and make ready waste. Changing the printing formes on wide web presses requires a high degree of automation while narrower presses can use light weight cylinders or printing forme sleeves. One might ask what amount of automation is necessary to achieve the required level of quality and effectiveness.

Narrow, less automated, but high-quality presses result in lower capital costs and lower consumable costs leading to lower hourly rates. Narrow-web widths also reduce makeready waste and by using narrow printing formes reproduction and engraving costs can be reduced by up to EUR 1000 per job. The economic importance of only a few minutes less setup time due to less automation and a lower printing speed is much less.

All problems and their respective solutions are subject to the final decisions on package printing being made by the packaging producers. There was no clear preference made between maximum automation with the aim of minimising labour costs and maximising productivity or down sizing and combining the strengths of gravure printing as necessary. ■