

New type of printing machine at printery Bercker

Large runs printed in inkjet

A very special inkjet printer stands at the German printing works printery Bercker. The digital giant prints runs of 500 books and even large print runs of several 10,000 copies just as quickly as cheaply. The publishing house "Het Spectrum" in Utrecht is the first customer to have material printed on this machine - the break-through in inkjet technology. "Nobody noticed that it wasn't offset printing."

Author: Arthur Lubbers

"Until recently large print runs were always produced in rotary offset", explains *Ludger v. Zwetse-laar*, Production Manager of Het Spectrum in Utrecht.

Old titles that are no longer in stock are now printed per unit in POD, on a toner base, quickly and cheaply for small print runs. (...) However, for larger runs digital printing is generally too expensive and the only alternative remains rotary printing.

In order to exploit the advantages of digital printing (short delivery dates, no plate production and less material loss), the graphics industry has long been seeking a digital production technology that can also be operated at low cost for larger runs.

Generally it is assumed that the solution must be sought in inkjet printing technology. "This also applies for mass production of books" believes *Ulrich Schurer*, General Manager and proprietor of the German printers Bercker, Kevelaer: "We investigated for a long time whether laser printing was the solution, but that was not interesting for us. We produce large runs, so only inkjet technology was appropriate for us."

Largest inkjet printer

Narrow-web, black-and-white rotary inkjet printers have already been on the market for some years now. Large printer manufacturers such as Xerox, Kodak and Océ supply such machines. However, Bercker has decided on a completely new solution – an inkjet printer that is much larger, specially developed for large print runs. Bercker was not moving onto thin ice here. Several major suppliers participated in the project. In a three-year experimental stage the probably largest inkjet printer in the world was developed. The printer is approx. 30 metres long (without binding line) and the printing head installation is approx. 4 metres high. The giant inkjet printer (called "Integrated Book Production System – IBPS") in Kevelaer including the coupled book line prints completely self-

reliantly. Operation is restricted in principle to checking the screens. Hardly any manual actions are required in the process between inserting the large reels of paper unprinted and the finished, produced books that run off the line ten metres further on.

Production

The book runs through a highly inventive process.

As in rotary printing, the IBPS machine prints with a maximum reel width of 135 cm. The machine is equipped with an automatic reel changer.

The unprinted paper web runs into the first of two 4-station printing stations that is designed for eight large inkjet printing heads. The innovation does not consist in the actual printing heads, which come from a well-known manufacturer, but in the fact that the printing heads arranged in pairs shift laterally to adapt to the desired format. This means that eight books (paperbacks) or 6 books in A4 format can be printed at the same time.

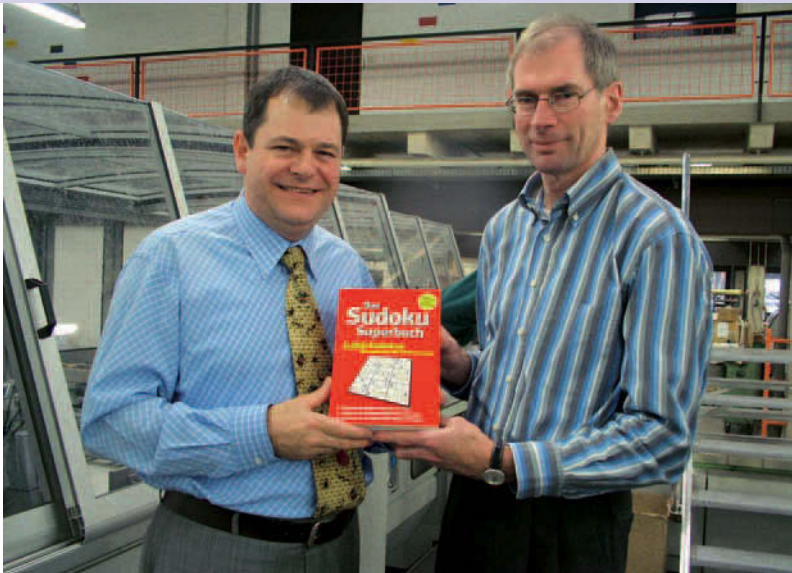
After the first impression printing, the paper web is passed via a vertical rod system to the second printing station for the verso print-

Bercker Graphischer Betrieb

Bercker in Kevelaer (on the Lower Rhine, close to the Dutch border) was established in 1870 as a pure book-binding shop. Ulrich Schurer together with his brother Klaus Schurer has been owner and general manager of the family firm with a workforce of approx. 170 since 1999. In addition to the new IBPS production, Bercker works with 4 one-colour and two-colour

Timson Rotations and a 4-colour Heidelberg Speedmaster for printing covers. The company also carries out further processing in house. Bercker produces almost 20 million books a year, of which 60 per cent are hardbacks (perfect binding and thread-stitching) and 40 per cent soft covers (perfect binding). The formats vary from paperback to A4 format.

process



ing. The printing ink does not come from toner cassettes, but instead from large drums containing the ink. The printed paper web is first cut lengthways and then crossways. After this the individual sheets are stacked to a book block.

As a result of the fact that the last page is printed first and the first page last, the book block is already arranged correctly and is passed on to the binding line where the books are given covers with a combination of hot melt and cold glue or PUR, are cut on three sides with the inline positioned triple cutter, and are made ready for sale.

Correct balance

The IPBS machine has been standing at Bercker since August 2006.

After two months 250,000 books had already been produced – in varying print runs from 500 to several ten thousands. The same utilisation rate as for the existing rotary printer is expected (mean value 1,000,000 books per month). During the test phase the web tensioning was the greatest problem, but according to a study by a manufacturer of cutting machines this question has now been solved.

The printer can now easily process 150 metres of paper web per minute and in future will very probably be able to cope with up to 300 metres. At present Bercker is chiefly printing on uncoated paper varieties from 50 grams upwards, but according to Mr. Schurer all paper varieties that run on “normal” rotary printing

machines can also be processed on the IBPS machine, in other words onionskin paper as well, for example for bible production.

“On the fly”

Ulrich Schurer (l.) and Ludger van Zwetselaar. The large inkjet printer represents a breakthrough in digital book production for both publishers and the printing shop. “As regards speed, inkjet printing was always interesting. Now the technology has developed so far that a useful quality is supplied.”

In actual fact, the IBPS machine also digitises book-binding. The digital printing of books offers quite a few advantages. Stapling or stitching is no longer necessary thanks to inline cutting. The smooth clarity of the layout is particularly conspicuous on bleed pages that no longer “jump”. Another advantage is the saving of paper, as a surplus for waste is included in the plans for gathering. Furthermore, formats are limited in offset printing.

A further plus point of IBPS is its avoidance of the need to produce plates, so that (smaller) runs can be printed quickly as the PDF file goes directly to the machine. The customer can supply the data in



At a speed of 150 metres a minute Bercker prints both sides of 6 books in A4 format at the same time.

just the same way as for conventional printing. As plate production is not necessary, the preliminary stage sends the data directly to the machine after ripping. Accordingly, this results in a very simple and short workflow.

“We already carried out a ‘flying change’ during the production of one work. Immediately after printing of the first eight books, the printing of the next work started”,

During the test phase webtensioning was the greatest problem

as it were “on the fly” explains Mr. *Schurer* proudly.

A lot can be achieved with efficient handling, in cooperation between customer and printing shop too. There is even talk of transferring the PDFs and information about print runs and processing directly from the publisher Het Spectrum to the computer of the machine at Bercker.

Great effects

Anyone wanting to see a difference by comparison with a conventionally printed book will have to look very carefully. *Van Zwetselaar* – with the project from the beginning – had books produced on IBPS for Het Spectrum already in the year 2005. “Nobody noticed that this wasn’t offset printing. Only one author noticed after some time that the printing screen looked different.”

Schurer: “As regards speed, inkjet technology was always interesting, but the engineering has now developed to such an extent that we have a usable quality as well. You need a magnifying glass to see the difference, but who reads with a magnifying glass?” The quality is very even. The first page shows the same blackness as the last page. A graphic artist will therefore check the half-tones in an illustration for the purpose of comparison. These look very

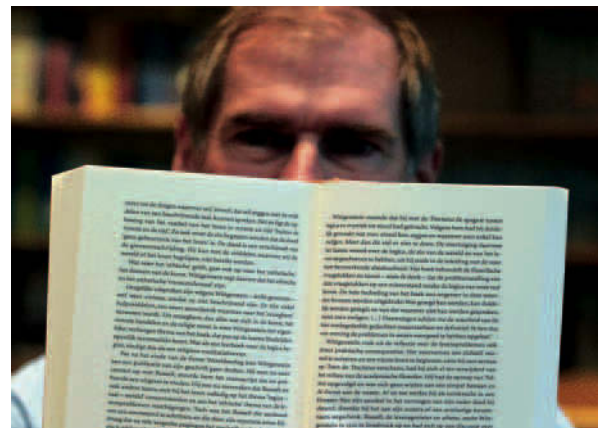
detailed. “It looks different than in offset printing and is like a random/stochastic printing screen”, says *van Zwetselaar*. This is due to the new technology. The illustrations look like drawings on the paper. This produces a very beautiful effect.

Remaindering

In small and medium print runs IBPS book printing competes with sheet printing, and in large print runs with rotary presses. *Schurer*: “Here we can reprint on demand and deliver within a few days.” The great advantage of this machine consists in being able to produce exactly the number of copies stipulated by the sales forecast. Producing what the market really requires – no more and no less. Changing print runs and reprints can be produced with the new machine much more quickly and cheaply than with a rotary press. In offset printing the prices drop in higher print runs, but reprints are expensive and time-consuming. That is why often excessively high print runs are printed that cannot be sold. With this technology it is possible to scale production down to the normal measure. *V. Zwetselaar*: “If we need 3,000 copies this year and 4,000 copies (as a reprint) next year, this can be handled more easily. And the savings in

cost continue. Storage costs vast amounts. That is really destruction of capital.”

Van Zwetselaar calls on publishers to use a different calculation for their break-even. “The old method, according to which one quarter of books sold recoups the costs now no longer applies. Instead it is necessary to ask oneself how can I make the largest profits?” After all,



each book that is sold at a loss costs money, says *van Zwetselaar*. Even if Bercker needs the large print runs, Mr. *Schurer* finds that the development is advancing more and more to producing in conformity with the market. “Rumage clogs the market. BMW doesn’t produce 100 cars in order to destroy a few afterwards!” If he had a say, only the second-hand bookshops selling rest runs would come off worse.

Ludger van Zwetselaar shows a printed book. Only with a magnifying glass you can see the difference.

Only second-hand bookshops would come off worse