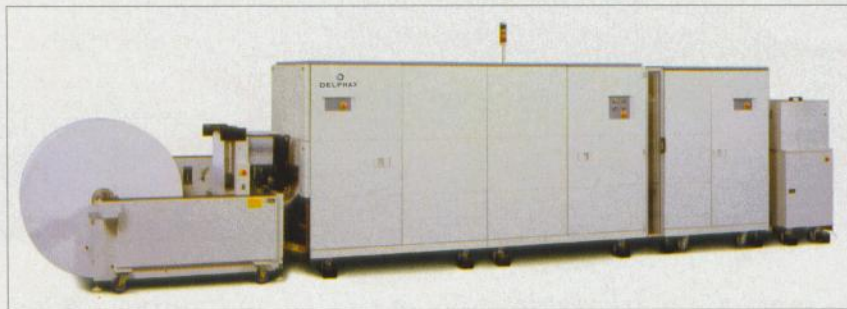


# technology TODAY

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The Delphax CR Series

Photos courtesy of Delphax Technologies Inc.

## Dynamic Digital Printing

It took Gutenberg three minutes to print a single page using his letterpress system of printing. As slow as his process seems today, it started a communication revolution that still continues. Over the last 550 years, people have developed many new printing technologies. Commercial printers accepted them if they met a particular printing need, increased worker efficiency, or increased profits.

Letterpress, gravure, screen process, and offset lithography has each functioned as the printing method of choice to duplicate a particular type of printed product. Recently, a new digital commercial printing technology has emerged. Many people feel that, over time, digital printing will replace all earlier methods of printing.

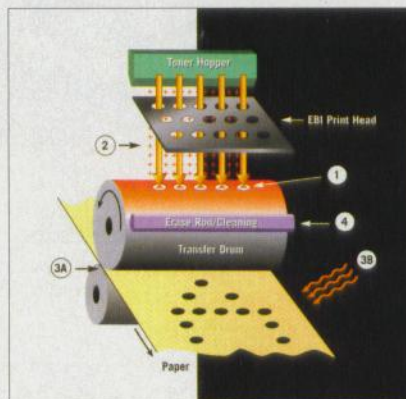
Dynamic digital printing (DDP) prints directly from a digital file without the use of conventional printing plates. This means that the image to be printed must be refreshed after each print—and that the next page printed can have different content without ever changing a printing plate. Until recently, DDP didn't work fast or cheap enough to warrant the attention of commercial printers.

The demonstration that Delphax Technologies Inc. ran recently at the On Demand Convention emphasized just how dynamic the dynamic digital printing process is. A Delphax CR 1300 digital webfed press can print the equivalent of 78,000 pages per hour. On the convention floor, it printed 300

feet of paper (2,400 pages) per minute as part of a manufacturing line that included an automatic cutter, stacker, and binder. With almost no human intervention, this manufacturing line changed the book title being printed every 30 copies while continuously printing and binding 200-page books every 5 seconds and 400-page books every 10 seconds. Without stopping the printing/binding process, the technicians running the operation switched book titles between *The Last of the Mohicans*, *Little Women*, and *The Odyssey*.

You can view this manufacturing process in a digital video on the Delphax homepage: [www.delphax.com](http://www.delphax.com). To view the video, click on the Books for Schools icon. Delphax donated the books it produced during the convention to schools in the Bronx.

Delphax Technologies is the developer of electron-beam imaging (EBI).




The electron-beam imaging process

This DDP printing process uses a beam of electrons to create, in an instant, a printing image directly from a digital file. With each turn of the drum, the next series of pages is positioned for printing to the fast moving web (roll) of paper. The CR 1300 is a *duplex* printing press, which means that it prints both sides of the paper at two identical printing stations that stand side by side.

Electron-beam imaging uses an electron beam instead of a laser to create the image. Streams of electrons carry toner to the drum, instantly forming all the letters and images that make up a page. After the toner is transferred and pressure fused to the paper, the paper goes through a radiant-heat fusing process that makes the image permanent. The electrical charge is then removed from the drum, and the process starts over again.

Electron-beam imaging is one of many direct digital printing technologies now vying for the attention of commercial printing customers. To learn about other types of digital printing, type "dynamic digital printing" into your favorite Internet search engine. Currently, these technologies prove most economical for short printing runs of 2,000 or fewer copies of books, booklets, course manuals, magazines, and brochures. Future innovations in direct digital printing will likely continue to increase printing speeds, worker efficiency, and profits. This should make DDP fully competitive with offset lithography in the next 10 to 15 years.

## Recalling the Facts

1. Why can't printing processes other than dynamic digital printing print different books, at the same time, without stopping their presses or changing their printing plates?
2. Describe how electron-beam imaging transfers an image from a digital file to paper.
3. Why do many futurists feel that DDP will eventually be fully competitive with offset lithography? 

Alan Pierce, Ed.D., CSIT, is a technology education consultant, technical writer, and public speaker on technology issues.