Oce VS 9000 - a New Platform for Digital Production Printing

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Abstract

Oce has launched a new platform for high speed digital web printing named VarioStream 9000.

The VS 9000 is a single pass duplex printing engine. The productivity of the first model is 800 A4 images per minute in b/w printing. The VS 9000 printer family will have versions for two color, three color, four color and five color printing. The lower versions are upgradable to the higer ones. Thus the VS 9000 offers to customers an economic migration path starting form effective b/w duplex printing to more and more color. Starting with the two color version Oce will launch the CustomeTone system for the VS9000 which offers company colors in a wide color space.

Market Situation

The print volume in digital b/w and color printing in Europe expected by CAP Ventures is shown in figure 1.

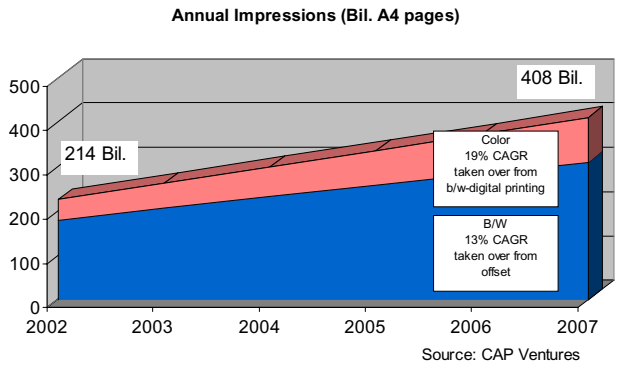

Figure 1. Annual digital print volume in Europe

There is an expected growth of more than ten percent for b/w and color printing as well. That means there would be demand for effctive b/w and color printing in the future. The expansion of digital color printing has some prerequisites which have to be taken into account: For example the aquisition of numerous jobs and the huge efforts in color job preparation. In so far it seems to be reasonable to create a printing system which is effective in b/w printing and which can be used partly to enter more and more the color printing market at reasonable cost. That printing system can be loaded up to 100% with the b/w jobs already available and according to the demand the color of the machine should be upgradable in an easy way.

Heavy Duty Industrial Printing

The design of an electronic printing system dedicated to industrial b/w and color printing has to fulfill the following requests:

- robust mechanical design
- high productivity
- print quality comparable to conventional offset
- low additional engine cost for additional color
- low cost per page
- upgradability starting from b/w to 2, 3, 4, 5 colors
- process color and company colors
- versatile interfaces
- easy to use.

The Oce VarioStream 9000 is designed to fulfill these demands. Figure 2 shows a photograph and figure 3 a functional sketch of the VS 9000.

Figure 2. VS 9000 consisting of the components operator panel, paper input module, print module, fusing module and filter module.

As main technology components, the new system contains two electrophotographic printing units working with OPC belts, intermediate belts, a two component tribo jump development and a LED character generator.

Each of the printing units is prepared to be operated with up to five developer stations.

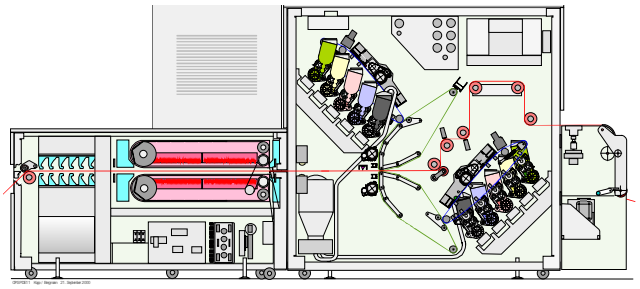

Figure 3. VS 9000 paper input, print module and fusing module

The two printing units form the images for the upper side and for the rear side of the paper. The transfer of both images is realized simultaneously which provides a good registration. The fusing process is contactless IR heating.

The first engine type of the platform is a black and white duplex engine containing just one developer station per printing unit (1/1). The second type is a two color duplex printing engine with two developer stations in each printing unit (2/2). For the next years the launch of the 3/3, 4/4 and 5/5 engines is planned.

The electrophotographic process speed is 1 m/s. That means the 1/1 printing engine produces 800 A4 images per minute. In the two color engine and in the multicolor systems the color separations are collected on the intermediate belt and transferred simultaneously to the paper. That means the productivity counted in multicolor images per minute will be reduced accordingly.

The VS 9000 uses a new two component developer system with fine carrier (see figure3) and fine toners.

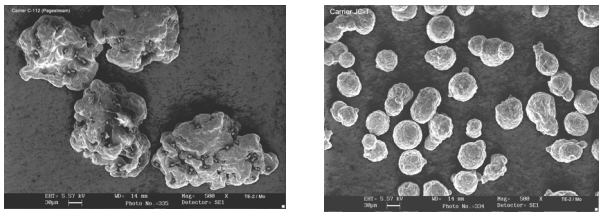

Figure 3. VS 9000 carrier (right) compared to VS 7000 carrier (left)

The 4/4 engine will be a full color duplex printer. Beyond the YMCK process colors the Oce CustomeTone colors are in preparation which would allow printing customized colors like company colors. The color space is sketched in figure 6.

The new process control provides the means to influence the maximum optical density level in wide range (OD max. = 0.6 ... > 2) and to change the tone curve shape independently. That means the tone curve of other printing machines (see figure 4) can be approached to get a similar appearence of the printed matter. On the other hand, this tool gives the oportunity to reduce toner consumption remarkably, for instance in newspaper printing.

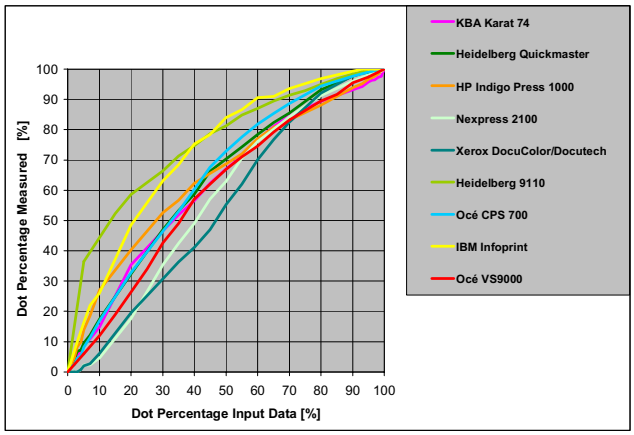

Figure 4. Tone curves of VS 9000 compared to tone curves of other printing engines

Figure 5. Different optical density levels printed on VS 9000

Figure 5 shows the same image printed at different maximum optical density levels on VS 9000.

The fusing station (see figure 6) consists of an infrared heating equipment which fuses the toner images on both sides simultaneously and a cooling module to reduce the paper temperature before the paper leaves the printer.

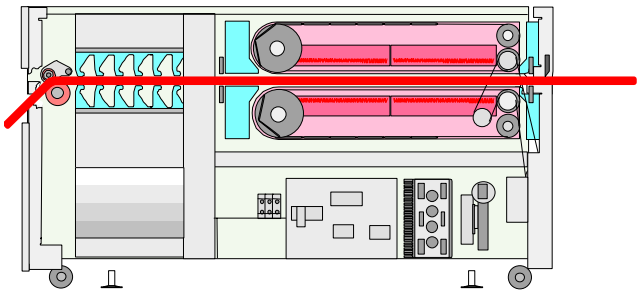

Figure 6. VS 9000 fusing station

The print quality level of the VS 9000 is comparable to offset because of the 600 dpi multilevel charactergenerator, the highly uniform OPC belt, the very soft toning system with extended color space and the contactless fusing process.

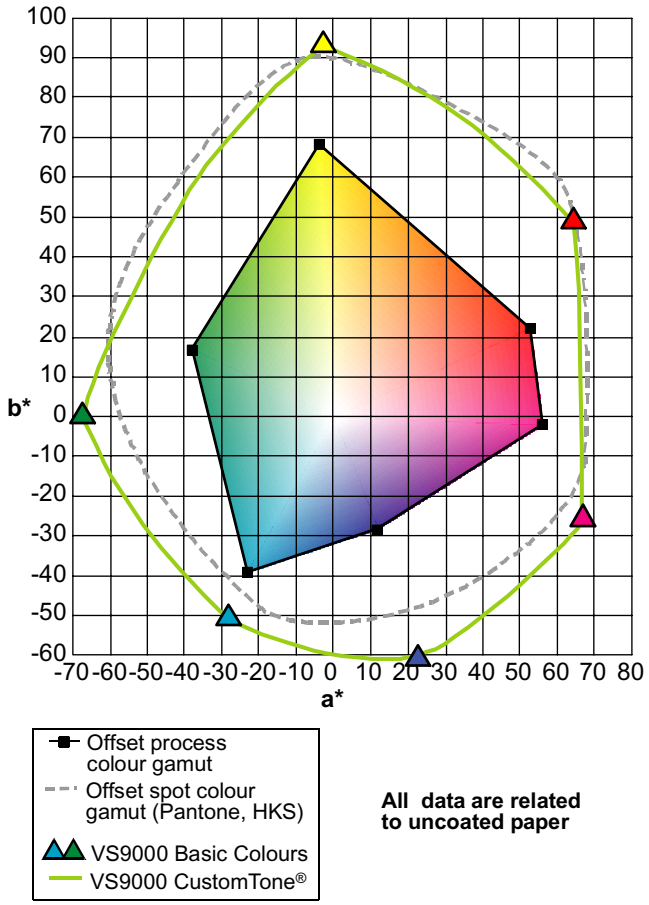

Figure 7. CustomeTone color space of the VS 9000

Conclusion

The Oce VS 9000 platform is based on new technology components and provides a upgradable printer family concept which allows to start with b/w-printing and migrate stepwise to growing color content in highlight/company colors and process color as well. This concept is dedicated to substitute offset in b/w and color printing.

Biography

Martin Schleusener is Executive Director Electrophotography in the R&D Printer Technology & Components Department of Oce Printing Systems in Poing, Germany. He is responsible for the technology development of the electrophotographic processes and components of the Oce high speed heavy duty printers. M. Schleusener is with Oce/Siemens since 1990.

He received his PhD degree in physics from the Technical University of Magdeburg and holds more than 50 patents worldwide.

M. Schleusener is a member of the IS&T and had served as European Program Chair and member of the Advisory Committee of former IS&T NIP conferences.