

# A Complete Digital Workflow Solution for Short-Run Production

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## Introduction

The decorative printing market, a genuine industrial printing market sees it's profit being consumed by ever growing inventory costs, while their customers are becoming more demanding, forcing them to react faster and offer more alternatives and new products.

The above requirements cannot be reconciled with their conventional production processes. By introducing *the.factory*, an industrial inkjet press printing UV-curing or oil-based inks on the substrates of the industry, **dotrix** is offering them a cost-effective solution for the mentioned challenges.

In this paper I will go into detail on these issues, and I will end with a cost calculation to prove the cost effectiveness of our digital solution

## The Decorative Printing Market

The decoration printing market consists of different, very profitable, niche markets.

Market segment	Manufacture
Floor	Laminate floor, parquet floor, vinyl tiles, vinyl floors and ceramic tiles
Wall	Borders, wallpaper, mural, panels...
Window & Door	Window blinds, doors
Furniture & Accessories	Decorative surfaces, interior fitting, kitchen furniture, ceramic tableware,...

Overall figures on the worldwide decorative printing market are not available. In 2001 the decorative laminate market worldwide was estimated at 11BN square meters with a finished (printed & converted) product-to-goods manufacturer value of \$17BN and a finished manufactured product-to-consumer value of \$40BN. The worldwide wallcovering market converted value exceeds the \$15BN per year. The total worldwide *Window & Door* market is smaller but therefore not less profitable. It exceeded in 2001 the 1.85 million euro, mostly soled the States and Europe and still growing.

**dotrix mission:**  
 provide complete digital printing solutions for each decorative niche market and hereby offer a very profitable solution for these markets limitations and challenges

The decorative printing division of **dotrix** is divided into several different business activities each focusing on one of the mentioned specific niche markets. It is **dotrix** mission to provide complete digital printing solution in each of these business activities.

Business activity	Manufacture	Why digital?
Engravers	gravure cylinders, flexo rollers, rotary, galvano and/or flat screens.	As a services bureaus for their customers
Printers	Spot-color printing on different decorative substrates.	For sampling, short run and personalized production
Product manufacturers	Final commercial goods: consumer or residential market	Can do short run production themselves.

Each of these markets is desperately looking for the right industrial digital printing solution for different reasons.

## The Market Trends

Using conventional printing methods decorative printing companies face several limitations and challenges. Therefore the manufacturers of such decorative consumer goods must be able to identify where digital technology can fit as a complementary method to conventional printing. We have seen a migration to digital printing in other printing areas such as the document world. These industries were also neglecting the advantages of digital imaging but over time they began to understand that digital printing could replace conventional production methods. Key advantages such as

- enormous reduction of inventory cost because of print-on-demand
- greater design freedom and less risk of purchasing and carrying patterns that do not sell well
- significant shortening of time-to-market
- profitable short run production
- high value personalized printing

will over time garner more and more interest among decorative suppliers.

### Inventory and Space Cost

Clearly one of the biggest costs for the decorative printing industry is the inventory cost. The different printing processes used in this industry are only suited for mass production. Cylinders for example take a long time to prepare, sometimes extending the whole production cycle from original designing to complete production to a matter of months. Gravure- and screen-printing have proven to work well for high volume production, but in addition to long production runs, tooling costs and screen changes can be problematic. Simply to engrave a cylinder with a four colour pattern can cost up to 6900 dollar (1725 dollar/cylinder) and do not forget the time cost of changing cylinders. Therefore distributors must stockpile hundreds of styles, patterns and raw materials.

A special hall is needed to store the printed substrates. The storage needs a climate-controlled environment to preserve colour quality and prevent product degradation due to mold and mildew, drying out and others forms of spoilage.

Not only the paper or other substrates as polypropylene, polyvinyl chloride and other polyolefin's must be stored, also all the different cylinders must be kept for reuse. In some companies even small preserving jars of the ink mixtures used are stored.

All manufacturers requisite very huge floor space not only for stock reasons but also because of the printing machines itself. Traditional printing uses huge printing machines with very big drying ovens (10 meters and more).



Figure 1. Conventional gravure press for laminate flooring.

As a comparison a digital printing machine using UV- inks can fit onto less than 15m<sup>2</sup>, has almost no

setup-time and does not require the production or storage of expensive cylinders or printed matter, and can produce small quantities in a very cost-effective way, one after the other continuously.

### New Design Possibilities

Another benefit of digital printing, which will be realized primarily by suppliers, is the ability to test designs to see which ones becomes a hit without having to generate cylinders, building up the press, mixing different ink sets and generating huge amount of waste products and/or stock. One has to realize that, before a decorative pattern can be sold to a customer, he first requires sample reels enabling him to judge the possible success of this specific pattern and colourway. If you take into account that approximately 80 percent of the purchases decorative consumer goods comes from only 20 percent of the generated designs, you immediately see the cost savings of digital printing.

Designs and patterns can be generated with ease on dotrix unique ARABESQUE<sup>MC</sup> software (see later) and sent immediately to the press server. The press operator can launch the job whenever wanted. Any design, style, idea is printed in an economical way and can be judged instantaneously.

Another advantage is that different colour sets generated on the ARABESQUE<sup>MC</sup> Colourways software are generated and printed immediately. The different colorations can be sent to distributors for selection and only after placing the order quantity printing is started.



Figure 2. Different color styles printed seamless

### Personalized Printing

Pattern limitations inherent to conventional printing technology hinder decorative wallpaper designers, and this also stops the growth of the industry. Without variety and innovation in wallcoverings imagery, customers are not likely to invest in this type of decoration. A wallpaper design is not longer limited to a repetition of 24inches, the maximum cylinder diameter of a gravure printing press, due to the fact that our digital printing solution for the décor market called Inspiration comes with the printstreamer technology. This means that a wallpaper border can continuously vary across the wall. Imagine a teenagers room covered with his favorite football team....or children's room with a personalized story. Digital wallcoverings provide the freedom for design professionals to create customized designs for their customers, and order just the amount they need the moment they need it.

### Mass Customization

Another very profitable decorative printing market is the residential market. Companies as Hermes are willing to

pay more for individual interior styling such as laminate flooring with integrated company logo's. Hotel chains, festivals, companies and others can order self-adhesive wallpaper or borders to decorate their buildings in a very personal way while promoting their brand name.

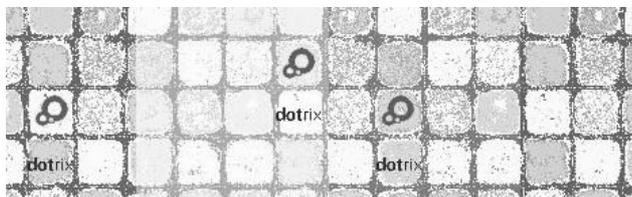


Figure 3. dotrix customized wallpaper design

### Time-to-Market

With a productive digital printing engine decorative printers will be able to do up to 4 times more samplings in the same time, thus the response time to their customers will be much faster and this is of an extreme high importance in this highly competitive world, and not to forget, all of this against a much cheaper price per sample. The impact on first samplings of a new design will even be bigger, as printers also save the production time and cost of the so-called baby- or sample cylinders.

Whenever new media events, movies, soaps ...pop up decorative printers can adapt immediately design and styling towards these new fashions. Those fashionable items are sold with higher margins and reflect inevitable in higher profit.

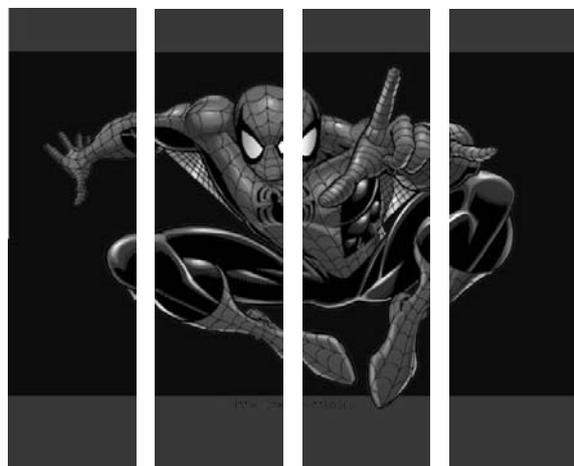


Figure 4. Spiderman design

### Total Digital Printing Workflow

Over the last 8 years we have seen enormous interest in digital printing for the decorative markets. dotrix has a tradition of providing total solutions and has all the elements to deliver a complete digital workflow: a suite of products for designing, colour management, imaging (film and plate setters) RIP technologies as well as screening. To complete the digital workflow, dotrix offers an industrial digital colour inkjet press called *the.factory*.

*the.factory* prints on the substrates of the industry, with the inks of the industry, and a quality comparable with conventional printing technologies. The total digital workflow for decorative markets, called [InSpiration Workflow](#) ensures a total and cost effective digital solution for short-run, sampling, personalized and fully variable data production printing.

The InSpiration workflow starts with *job origination*. Designs and patterns can be generated with ease on the unique ARABESQUE<sup>MC</sup> Designer software. It allows designs to be created from scratch in any number of special colours. Existing designs that have been separated from CMYK into special colours are also easily retouched at any stage. Designs can be interactively visualized in repeat, as work progresses. The Arabesque Separation module differs from other CAD/CAM systems in its capability to separate large and complex designs (up to 1 Gigabit per special colour), not only in a fast and productive way, but also with the highest quality, since the specifications of the desired printing technique are continuously taken into account. The Arabesque<sup>MC</sup> Colorways module gives you the possibility to generate an unlimited amount of colour variations of the same on screen.

Next step in the InSpiration workflow is *job generation*. Once a design is originated, the Rip settings have to be defined. This is done on the JobManager Interface. This network application runs as a client on any windows prepress workstation. Job generation contains different tuned software package used to prepare the file to print.



ACCESS<sup>MC</sup> is an easy to use program to convert foreign digital formats in formats which are compatible with the InSpiration workflow



FINETUNE enables fast color matching towards the target color of the design. Adding red or yellow becomes as easy as pressing a button.



KALEIDOSCOPE provides a color management chain from the front-end until the press. What you see on the monitor is what you will get on the press.



The INSPIRATION RIP converts job ticket files that are generated in Arabesque or FineTune, into the.factory job files.



EASYMURAL is the solution for those who want to print murals digitally. The mural will automatically be divided in panels matching the width of the digital press.

Once the data is ripped, the data needs to be streamed at very high speed towards the digital press. This is called *data control*. The press server stores the ripped data and controls the dataflow towards *the.factory* digital press.

*Print!* Our industrial digital DoD Single Pass Inkjet Colour Engine (SPICE) with static print heads is

designed for fast production printing. the.factory prints 24 meter running meters a minute resulting in up to 907 square meters per hour at max printing width of 630 mm. The 300 dpi grey scale head, 8 levels per spot, provide a perfect, acceptable print quality of comparable with 1000dpi.

A close coupling between the production control unit and the application software ensures a seamless workflow, suited for even the most demanding decorative jobs.

### Price Comparison Between Conventional and Digital Printing

One has to realize that, before a decorative pattern can be sold to a customer, he first requires sample reels, in 63 cm width, that will enable him to judge the possible success of this specific pattern and colourway. Therefore decorative printers have laboratory presses where they can print sample quantities up to a width of 63 cm. These sample-presses are operated mostly in 3 shifts and represent a enormous cost factor.

<b>Conventional sampling printing</b>	
Linear meters in m <sup>2</sup> (200 lm * 0.63 m)	126 m <sup>2</sup>
Number of sampling jobs per week	30
Working weeks per year	45.5
Square meters for sampling per year	171.990 m <sup>2</sup>
Costs for sampling per square meter	4.75 €
Total costs for sampling per year	816.952,50 €
<b>The.factory sampling cost</b>	
Square meters for sampling per year	171.990 m <sup>2</sup>
Costs for sampling per square meter	2.21 €
Total costs for sampling per year	380.097,90 €
<b>Savings on sampling cost</b>	
Square meters for sampling per year	171.990 m <sup>2</sup>
Savings per square meter	2.54 €
Savings per year	436.854,60 €

### Conclusion

Soft facts:

- Low Inventory and space cost
- New design possibilities
- short run production
- Personalized printing
- Mass customisation
- Time to market

Hard facts

- Savings for sampling 2.54 €/m<sup>2</sup>

### Biography

**Jasmine Geerinckx** is the manager of the Decorative Printing group. She has an engineering degree in textile and decorative applications and a post-graduate degree in applied marketing. After two years of working in the research department of a textile production company in Germany, she joined Barco as Application Specialist for the Ceramics Printing market.

In 1998 she was promoted to manager of the Decorative Printing Applications. In this function she has the worldwide responsibility for the sales-, marketing-, and development of these products.