

## **Interrelationship between textile design styles and production methods**

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Mechanical production methods influence both design aesthetics and styles. In the field of printed textile design, the latest digital fabric printing technology has influenced the style and definition of printed textile design.

Digital fabric printing has had an impact on 2 directions in textile design: (1) readjusting conventional printing design and (2) emerging new looks in design. Historically, textile printing has conventionally been executed by utilizing transferring media, such as screens and rollers. Each transferring media is engraved and assigned for a specific color. A block printing and engraved copper printing are the early examples of these methods. In block printing, a number of colors in design represent a number of woodblocks that are carved. Each block representing color separations mainly consists of flat silhouette shapes. A three dimensional effect of the motifs is obtained by printing several layers of flat separated shapes. So-called "traditional floral design" printed by rotary screen printers today (Figure 1), still retains the same look as the historical block printed designs. Historically, engraved roller printing consists of lines and dots engraved on copper surfaces, just like in intaglio printing. These methods created the finest quality of detailed lines and tonal effects, which are still the goals for today's printing technology. So-called "toile design" printed by flatbed and rotary printers originated from this historical printing method (Figure 2), and have set the standard for traditional textile design looks, which are currently in the market today. Many consumers of printed fabrics tend to demand fabric design that contains familiar and preconceived looks, which reflect historical and document oriented designs. These designs are always in demand and popular in the mass market.

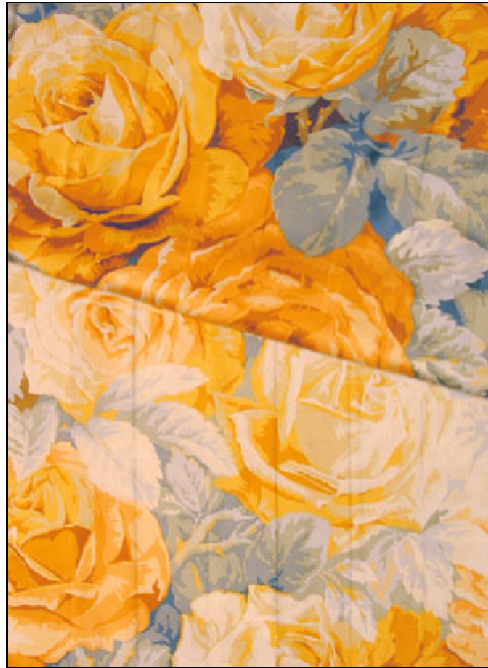
In the last several years, digital fabric printing technology has developed and improved; so that, design firms, mills and converters are now utilizing these production methods. Digital printing methods have enabled manufactures to produce a digital sampling and strike off of designs prior to engraving. It is apparent that digital textile printing technology has not influenced the style of the design, but has been utilized to expedite the design process. A majority of the digital fabric printers for sampling and strike off are based on process color systems to simulate the effects of spot color based conventional printing. Digital printing technology saves time for design processes including; design alternation, colorways and strike off. Comparatively, printed textile design is much more quickly and efficiently produced for the market needs than conventional printing processes. Consequently, stylists can maintain a higher level of a design quality and aesthetics by continually refining the design in the printing process. As far as printing style is concerned, conventional printers can produce a wide variety of styles, such as direct, discharge, devore, plisse, warp print, etc. In comparison, digital printing technology has only been developed for a direct printing application. The latest continuous head printer, Zimmer Chromojet, is designed as a spot color based production printer. Although this printer is still a direct printing application, new developments in continuous head technology might lead to more complex styles of printing that require more demanding chemical substances.

Unlike any conventional textile printing technology, the biggest advantage for digital fabric printing is in its process color application. Preset colors eliminate a need for screens or rollers to be engraved. The design does not require any set repeat size nor even repeats itself. At the same time, there is no restriction of the numbers of colors in the design. Any graphics created for printing on paper can be printed on fabrics. Photographic and tonal graphics created with millions of colors in Photoshop can be printed on fabric. Latest development of inks, color management software and substrates enable users to produce wider color gamut and finer printing quality. The addition of extra preset colors of orange, blue, green etc. to the traditional process colors of CMYK, have become the new standard for process color. At the same time, color management software has recently developed to manage these complex color systems. Drop on demand technology allows to do a short run production on a variety of substrates with minimal down time. For this reason, a new look of digitally printed fabrics is emerging in the high-end fashion design field. Experimental looks of textile design are emerging in the market by small print shops, individual designers and students. The current general design trends including concepts of shadow, shimmering, translucent, vibration, reflection, moire, optical, netting, blurring, layering, superimposing, etc. are directly seen on digitally printed textiles. These creative approaches can lead to successful experimentation, which create new trends and design movements. This allows designers to create successful designs, which are either avant-grade or commercially viable. Similarly, silkscreen printing gave artists and designers great freedom of creativity. Designers were able to experiment with multiple images on fabrics, before it developed into major textile printing technology. Digital textile printing will follow the same path and a new design look with freedom of process color application will be seen on mass market. At the same time, currently many companies have been researching and developing high performance piezo drop on demand production printers. For example, the Dupont Artistri printer has a capacity to produce higher volumes than most digital printers. Currently, printing speed is one of factors that require more improvement in digital fabric printing, compared to conventional textile printing. The year 2000 was a pivotal year for the development of production digital printers and the issue of speed will be solved in time.

Digital fabric printing has not only influenced visual styles, but also the concept and definition of printed textile design. Because of the development of digital fabric printing, printed textile design has become more universal in its application and function. For instance, textile designers can create printed textile design as a big contained image without repeat, just like a graphic banner. In this sense, print design can function as a graphic advertisement instead of a conventional textile pattern in repeat. Fashion or interior designers can create their own printed fabrics more effortlessly. These designers can produce printed textiles on their own without depending on textile designers by simply operating digital printers. Traditional definition of textile design has been dictated by the repeat and color limitation with a specific textile end use. In contrast, the new definition of printed textile design represents printed graphics on cloth in cross platform applications. However, because of the creative freedom in which anything can be printable and anyone can be a print designer, it is critical to consider the design quality and aesthetics.

It is our prediction that in the near future, textile printing production will change from a few major textile mills to many small digital textile printing shops. Further innovation in digital printing technology will have an impact on the style and definition of printed textile design. Future application of digital technology will become more creative, innovative, and commercially viable for the designers as well as consumer.

### Figures



*Figure 1. Sample of Traditional Floral design Printed by Rotary Printer. ©1990 Jack Lenor Larsen*



*Figure 2. Sample of Toile design Printed by Flatbed Printer Peter Fasano Inc. ©2000 Designed by Heather Ujiie*

### References

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