



# Digital and Manual Textile Printing

Digital printing refers to methods of printing from a digital-based image directly to a variety of media. It usually refers to professional printing where small-run jobs from desktop publishing and other digital sources are printed using large-format and/or high-volume laser or inkjet printers.

Digital printing has a higher cost per page than more traditional offset printing methods, but this price is usually offset by avoiding the cost of all the technical steps required to make printing plates. It also allows for on-demand printing, short turnaround time, and even a modification of the image (variable data) used for each impression. The savings in labor and the ever-increasing capability of digital presses means that digital printing is reaching the point where it can match or supersede offset printing technology's ability to produce larger print runs of several thousand sheets at a low price.

Manual Textile printing is the process of applying color to fabric in definite patterns or designs. In properly printed fabrics the color is bonded with the fiber, so as to resist washing and friction. Textile printing is related to dyeing but, whereas in dyeing proper the whole fabric is uniformly covered with one color, in printing one or more colors are applied to it in certain parts only, and in sharply defined patterns. In printing, wooden blocks, stencils, engraved plates, rollers, or silk screens can be used to place colors on the fabric. Colorants used in printing contain dyes thickened to prevent the color from spreading by capillary attraction beyond the limits of the pattern or design

## Digital printing methods

### Fine art inkjet printing :

Fine art digital inkjet printing is printing from a computer image file directly to an inkjet printer as a final output. It evolved from digital proofing technology from Kodak, 3M, and other major manufacturers, with artists and other printers trying to adapt these dedicated prepress proofing



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machines to fine-art printing. There was experimentation with many of these types of printers, the most notable being the IRIS printer, initially adapted to fine-art printing by programmer

David Coons, and adopted for fine-art work by Graham Nash at his Nash Editions printing company in 1991. Initially, these printers were limited to glossy papers, but the IRIS Graphics

Printer allowed the use of a variety of papers that included traditional and non-traditional media.

The IRIS printer was the standard for fine art digital printmaking for many years, and is still in use today, but has been superseded by large-format printers from other manufacturers such as Epson and HP that use fade-resistant, archival inks (pigment-based, as well as newer solvent based inks), and archival substrates specifically designed for fine-art printing

Substrates in fine art inkjet printmaking include traditional fine-art papers such as Rives BFK, Arches watercolor paper, treated and untreated canvas, experimental substrates (such as metal and plastic), and fabric.

For artists making reproductions of their original work, inkjet printing is more expensive on a per-print basis than the traditional four-color offset lithography, but with inkjet printing the artist does not have to pay for the expensive

printing-plate setup or the marketing and storage needed for large four-color offset print runs. Inkjet reproductions can be printed and sold individually in accordance with demand. Inkjet printing has the added advantage of allowing artists to take total control of the production of their images, including the final color correction and the substrates being used, with some artists owning and operating their own printers. Digital inkjet printing also allows for the output of digital art of all types as finished pieces or as an element in a further art piece. Experimental artists often add texture or other media to the surface of a final print, or use it as part of a mixed-media work. Many terms for the process have been used over the years, including "digigraph" and "giclée". Thousands of print shops and digital printmakers now offer services to painters, photographers, and digital artists around the world

**Digital laser exposure onto traditional photographic paper :** Digital images are exposed onto true, light sensitive photographic paper with lasers and processed in photographic developers and fixers. These prints are true photographs and have continuous tone in the image detail. The archival quality of the print is as high as the manufacturer's rating for any given photo paper used. In large format prints, the greatest advantage is that, since no lens is used, there is no vignetting or detail distortion in the corners of the image.

Digital printing technology has grown significantly over the past few years with substantial developments in quality and sheet sizes.

### Applications

Digital printing has many advantages over traditional methods. Some applications on the note include:

- Desktop publishing – inexpensive home and office printing is only possible because of digital processes that bypass the need for printing plates
- Variable data printing – uses database-driven print files for the mass personalization of printed materials
- Fine art – archival digital printing methods include real photo paper exposure prints and giclée prints on watercolor paper using pigment based inks.
- Print on Demand – digital printing is used for personalized printing for example,

children's books customized with a child's name, photo books (such as wedding photo books), or any other short

run books of varying page quantities and binding techniques.

- Advertising – often used for outdoor banner advertising and event signage, in trade shows, in the retail sector at point of sale or point of purchase, and in personalized direct mail campaigns.
- Photos – digital printing has revolutionized photo printing in terms of the ability to retouch and color correct a photograph before printing

Traditional / Manual textile printing techniques may be broadly categorized into four styles

- Direct printing, in which colorants containing dyes, thickeners, and the mordant or substances necessary for fixing the color on the cloth are printed in the desired pattern.
- The printing of a mordant in the desired pattern prior to dyeing cloth; the color adheres only where the mordant was printed.
- Resist dyeing, in which a wax or other substance is printed onto fabric which is subsequently dyed. The waxed areas do not accept the dye, leaving uncolored patterns against a colored ground.
- Discharge printing, in which a bleaching agent is printed onto previously dyed fabrics to remove some or all of the color.

Resist and discharge techniques were particularly fashionable in the 19th century, as were combination techniques in which indigo resist was used to create blue backgrounds prior to block-printing of other colors. Most modern industrialized printing uses direct printing techniques

### Technology

Textile printing was introduced into England in 1676 by a French refugee who opened works, in that year, on the banks of the Thames near Richmond. Curiously enough this is the first print works on record; This is an old story from a reference in the late 1800s but it has never been proven and is generally not believed to be the case anymore. There are no French names on the list of fabric printers and dyers at that time. Later a few French Huguenots arrived but that was after the British had a flourishing calico printing industry established. but the nationality and political status of its founder are sufficient to prove that printing was previously carried on in France. In Germany, too, textile printing was in all probability well

established before it spread to England, for, towards the end of the 17th century, the district of Augsburg was celebrated for its printed linens, a reputation not likely to have been built up had the industry been introduced Later than 1676

### **Methods of printing**

There are seven distinct methods at present in use for producing colored patterns on cloth:

#### **Hand block printing**

This process, though considered by some to be the most artistic, is the earliest, simplest and slowest of all methods of printing.

In this process, a design is drawn on, or transferred to, a prepared wooden block. A separate block is required for each distinct color in the design.

A block cutter carves out the wood around the heavier masses first, leaving the finer and more delicate work until the last so as to avoid any risk of injuring it during the cutting of the coarser parts. When finished, the block presents the appearance of flat relief carving, with the design standing out.

To print the design on the fabric, the printer applies color to the block and presses it firmly and steadily on the cloth, ensuring a good impression by striking it smartly on the back with a wooden mallet. The second impression is made in the same way, the printer taking care to see that it fits exactly to the first, a point which he can make sure of by means of the pins with which the blocks are provided at each corner and which are arranged in such a way that when those at the right side or at the top of the block fall upon those at the left side or the bottom of the Previous impression the two printings join up exactly and continue the pattern without a break. Each succeeding impression is made in precisely the same manner until the length of cloth is fully printed. When this is done it is wound over the drying rollers, thus bringing forward a fresh length to be treated similarly.

Block printing by hand is a slow process it is, however, capable of yielding highly artistic results, some of which are unobtainable by any other method.

#### **Engraved copperplate printing**

The printing of textiles from engraved copperplates was first practiced in the United Kingdom by Thomas Bell in 1770.

The presses first used were of the ordinary letterpress type, the engraved plate being fixed in the place of the type. In later improvements the well-known cylinder press was employed; the plate was inked mechanically and cleaned off by passing under a sharp blade of steel; and the cloth, instead of being laid on the plate, was passed round the pressure cylinder. The plate was raised into frictional contact with the cylinder and in passing under it transferred its ink to the cloth.

The great difficulty in plate printing was to make the various impressions join up exactly; and, as this could never be done with any certainty, the process was eventually confined to patterns complete in one repeat, and was made obsolete by roller printing. Roller printing, cylinder printing, or machine printing

This elegant and efficient process was patented and worked by Bell in 1785 only fifteen years after his application of the engraved plate to textiles. Bell's first patent was for a machine to print six colors at once, but, owing probably to its incomplete development, this was not immediately successful, although the principle of the method was shown to be practical by the printing of one color with perfectly satisfactory results. The difficulty was to keep the six rollers, each carrying a portion of the pattern, in perfect register with each other. This defect was soon overcome by Adam Parkinson of Manchester, and in 1785, the year of its invention, Bells machine with Parkinson's improvement was successfully employed by Messrs Livesey, Hargreaves and Company of Bamber Bridge, Preston, for the printing of calico in from two to six colors at a single operation.

The advantages possessed by roller printing over other contemporary processes were three: firstly, its high productivity, 10,000 to 12,000 yards being commonly printed in one day of ten hours by a single-color machine; secondly, by its capacity of being applied to the reproduction of every style of design, ranging from the fine delicate lines of copperplate engraving and the small repeats and limited colors of the perrotine to the broadest effects of block printing and to patterns varying in repeat from 1 to 80 in.; and thirdly, the wonderful exactitude with which each portion of an elaborate multicolor pattern can be fitted into its proper place without faulty joints at its points of repetition.

#### **Stencil printing**

The art of stenciling is not new. It has been applied to the decoration of textile fabrics from time immemorial by the Japanese, and, of late years, has found increasing employment in Europe for certain classes of decorative work on woven goods for furnishing purposes.

The pattern is cut out of a sheet of stout paper or thin metal with a sharp-pointed knife, the uncut portions representing the part that is to be reserved or left uncolored. The sheet is now laid on the material to be decorated and color is brushed through its interstices.

It is obvious that with suitable planning an all over pattern may be just as easily produced by this process as by hand or machine printing, and that moreover, if several plates are used, as many colors as plates may be introduced into it. The peculiarity of stenciled patterns is that they have to be held together by ties, that is to say, certain parts of them have to be left uncut, so as to connect them with each other, and prevent them from falling apart in separate pieces. For instance, a complete circle cannot be cut without its center dropping out, and, consequently, its outline has to be interrupted at convenient points by ties or uncut portions. Similarly with other objects. The necessity for ties exercises great influence on the design, and in the hands of a designer of indifferent ability they may be very unsightly. On the other hand, a capable man utilizes them to supply the drawing, and when thus treated they form an integral part of the pattern and enhance its artistic value whilst complying with the conditions and the process.

### Screen-printing

Screen printing is by far the most used technology today. Two types exist: rotary screen printing and flat (bed) screen printing. A blade squeezes the printing paste through openings in the screen onto the fabric.

### Digital textile printing

Digital textile printing, often referred to as direct to garment printing, DTG printing, and digital garment printing is a process of printing on textiles and garments using specialized or modified inkjet technology. Inkjet printing on fabric is also possible with an inkjet printer by using fabric sheets with a removable paper backing. Today major inkjet technology manufacturers can offer specialized products designed for direct printing on textiles, not only for sampling but also for bulk production. Since the early 1990s, inkjet technology and specially developed water-based ink (known as dye-sublimation or disperse direct ink) has offered the possibility of printing directly onto polyester fabric. This is mainly related to visual communication in retail and brand promotion (flags, banners and other point of sales applications). Printing onto nylon and silk can be done by using an acid ink. Reactive ink is used for cellulose based fibers, such as cotton and linen. Using inkjet technology in digital textile printing allows for single pieces, mid-run production and even long-run alternatives to screen

printed fabric.

### CONCLUSION

Though the current printing world has fast and effective way of working but there are few things which we need to focus on.

The manual print process is still and always be in practice because it's the only way to keep the traditional work alive, the digital print work has taken over the world but only satisfies the industries who deal with heavy work loads

The print world is growing more and more these days , its not sure where the level of intensity will reach in the next few years, the current scenario is vividly showing the colors of people and their work

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