

Asian Resonance

Serigraphy: Methods and Materials of Fine Art and Commercial Printing in Present Scenario

Abstract

The combination of vibrant opaque blocks of color and transparent delicate shades makes Serigraphy one of the most satisfying print processes. This introduction out-lines all the basic techniques and materials as an important element of printing. Basically, ink is pulled over a mesh which is supporting a stencil. The positive image areas let the ink pass through to be deposited on the substrate, while the non-image areas do not. Screen printing is the first major new arrival in the printmaker's repertoire since the development of lithography. Today it has become a very sophisticated process, utilizing advanced fabrics and inks combined with computer technology. Often it is used as an alternative for many other processes such as offset litho.

Keywords: Serigraphy, Stencils, Ink, Substrate, Process.

Introduction

Today, screen printing is a popular medium used for commercial as well as artistic printing. The origin of screen printing dates back thousands of years. The natives of Polynesian Island produced the first screen prints by cutting shapes into banana leaves and pressing dye through the cut-out portions. *This is the basic principle of screen printing – forcing dye through a stencil to create a design.* Earlier forms of stenciling (using blowpipes to apply the color) were found even in Prehistoric caves.

In Japan during the Sung Dynasty (A.D. 960-1280)¹, elaborate paper stencils were produced for decorating ceremonial robes, walls, ceilings and pottery. In order to keep loose pieces and fine details of a stencil in place, human hair was used as a "tie", as it was strong enough to secure the free parts and thin enough to allow ink to pass around them on the desired substrate.

During the middle ages, similar stenciling was used for mass production of playing cards and religious pictures. In the 1700s, human hair was replaced by silk, which allowed for more complex and uniform prints. This is also how the name *Silk Screen Printing* was derived.

In 1907 Samuel Simon of Manchester, patented the first industrial screen printing process.² He employed stopping-out liquid to paint the negative image on to a mesh of bolting silk which was stretched on a wooden frame. In 1914, San Franciscan John Pilsworth patented a multicolor screen printing process.³

During the First World War, screen printing was used extensively for posters, banners, flags, etc. By 1920s, it was used by a number of graphic artists of the Art Deco and Art Nouveau movements. Even in the early 1950's it remained a crude and hand done process and the medium was accepted as a valid means of communication by the artists. In 1960s, artists of Pop Art movement; Andy Warhol, Rauschenberg and Hamilton popularized screen printing as an art form.

Artists referred the process of Screen printing as *Serigraphy*. The name 'Serigraphy' was coined by Mr. Carl Zigrosser, Curator of prints at Philadelphia Museum of Art, from the words 'seri' (silk) and 'graph' (to draw).⁴

Serigraphy is a versatile medium that has proved its utility in various and diverse applications. It is the one process that can print on virtually anything and on any shape having tremendously bright colors as well as it is an ideal process for very short print editions and even when the substrates are like wood, plastic and metal which do not easily travel through a litho press.⁵ Artist's original work can be reproduced with utmost resemblance through this printing process. It is also possible to print by depositing thick layers of ink which could give an impression of painting.



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Printing Process

Serigraphy is a stencil process and is based on the principle of blocking out areas of the mesh (screen) in order to prevent color from passing through while leaving clear open areas which allow ink through the mesh.

To begin with printing, we would require a fine mesh screen stretched over a frame and a stencil of an image. The stencil acts as a mask, is attached to a fine mesh and the printing paper is then laid below the screen. Ink is poured on to the screen at one end and pulled across the whole area of the screen with a squeegee. The screen is lifted up to reveal the printed image underneath.

Equipments and Accessories

1. Printing Table is an ordinary table, convenient to work on while standing with flat and smooth surface.
2. Screen Frames are rectangular frames of various sizes, over which the screen mesh is tightly stretched.
3. Screen Or Mesh Material is the most important item. Initially, silk was used as an ideal fabric. However, in recent times, nylon fabric or '*Bolting cloth*' is commonly used.
4. Squeegee is an accessory by which ink is pulled across the screen with a certain pressure. It comprises a wooden handle, the working end is fitted with a strip or 'blade' made of special rubber known as 'packing rubber'.
5. Wooden Strip Device is a wooden strip of 6-8cm width and of approximately the same thickness as the screen frame. It is fixed to one end of the printing table with two ordinary hinges. The function of this device is to help lift up and lower the screen frame while printing.
7. G-Clamp is a device to attach the frame to the wooden strip on the printing table for printing.
8. Drying Racks are used to place the printed matter for drying.
9. Light Box /Tracing Table is a table equipped with proper light source below a transparent glass used for tracing designs.
10. Printing Ink for screen printing is different from the inks used for other printing processes. They are distinguished by the prefix of the letters 'SS', which denotes '*Silk Screen* printing ink'. These inks are manufactured in different varieties or grades for specific requirements.⁷
 - Screen printing inks are available in the following varieties:
 1. Oil based
 2. Lacquer or PVC
 3. Fluorescent
 4. Ceramic
 5. Textile inks
 - OTHER ACCESSORIES:
 1. Stencil cutter,
 2. Drawing board,
 3. T-square, Setsquares and rulers,
 4. Transparent glass sheet,
 5. Steel ruler,

6. A pair of scissors, a pen-knife, a packet of blades, drawing pins, twine, paper clips, and a pallet knife, etc.
7. A bottle of paste, transparent tape, rolls of gummed paper tape, rubber solution tubes or economy-size tins.
8. Common carpentry tools like nails, hammer, nail-removing pliers
9. Iron
10. Kerosene, old newspapers and clean cloth rags (for cleaning).

Stencils

Stencil is an important constituent of the process. There are four basic types of stencils: paper stencil, block-out stencil, shellac stencil and photographic stencil.⁸

Paper Stencil

Trace or draw the design to be printed on a thin and pliable tracing paper or plain paper and cut out the portion which has to be printed. Paste the stencil in the centre of the screen. Place a sheet of paper on the printing table and lower the screen frame over it. Pull the ink with a squeegee from one end to another on the inside surface of the frame. Ink penetrates through the open portions and reproduces the exact design on the sheet of paper below. Repeat the process for producing more prints.

Paper stencils are used only for simple stenciling or 'rough' work, where only bold patterns are to be printed. If the pattern is intricate, it is difficult for the minute, delicate details to remain stuck on to the screen for long.⁹

Block-Out Method

It is the simplest and direct method and does not require a separate stencil. The screen itself acts as a stencil. The mesh of the screen is 'blocked-out', wherever necessary.

Glue Stencil: Trace the design lightly on the screen and block-out the areas which we do not wish to print with a liquid filler or glue (available at screen printing suppliers). It can be applied with a brush, scraper or finger, depending on the textural quality required. This leaves the open design area ready for printing.

Tusche Stencil: Fill in the portions to be printed on the upper side of the screen with tusche ink and let it dry. Now, coat the entire screen with gum (any water-based filler), allow it to dry thoroughly. *P.V.A. is a particularly effective coating.*¹⁰ Clean both the sides of the mesh with turpentine to remove the tusche ink. Open areas will now appear which were previously covered by tusche ink.

Lacquer Stencil: The portions which are not to be printed are blocked-out with lacquer. *Lacquer is a mixture of cellulose and other chemical. It dissolves only in a special liquid known as 'lacquer thinner'.*¹¹

Shellac Stencil

It is an improved form of paper stencil. There are some designs and letters which, on cutting, separate from the body of the stencil. To eliminate these shortcomings, shellac stencil papers are used. Keeping the design on the drawing board, place the shellac paper over it with the shellac side up and cut

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out the design with very light pressure so that only the shellac paper is cut through and not the thin backing. Remove the cut-away shellac coating portions only and place the underside of the screen over the stencil. Place a folded paper or cloth inside the frame and run a hot iron over it, lengthwise and breadthwise with a firm, constant pressure. Raise the frame and gently remove the thin baking paper. The shellac has stuck flat and firm to the underside of the screen and it is ready for printing.

Photographic Stencil

In early stages of screen printing, cut-out stencils were used and after that glue stencils, tusche stencils, shellac stencils, etc were developed. Later, for clear printing of very small letters or designs 'Photo-stencils' were invented. *It is a stencil that is light sensitive so that exposure to ultraviolet light hardens the surface causing it to become impervious to water.*¹² The image is drawn on a transparent paper so as to allow light to pass through the parts of the stencil which are to become hard and resistant. When washed, the soft stencil areas (those which were not exposed) are removed and the image is clearly defined. The photographic pigment gelatin is transferred to the screen by a special exposing and developing process. *This principle applies to all photo stencils whether they are coated directly on the screen or indirectly processed away from the screen and fixed on later.*¹³

There are three methods which come under the Photographic stencils.

Direct Photo Stencil: The screen (mesh) is coated with a photo-sensitive emulsion and after drying, it is exposed to light which passes through a positive image (transparency). The positive image protects the emulsion so that it remains soft and can be washed away, while the exposed areas become hard and remains on the mesh.

Indirect Photo Stencil: They are made away from the screen and attached to it after being exposed and developed. The stencil is formed in a two-layer film. The layer at the emulsion side of the positive is placed in contact with the backing sheet of the stencil and exposed to light. It is then developed in a solution of hydrogen peroxide, which hardens the exposed areas on the stencil. Then it is washed to remove the soft areas. Now the plastic baking can be removed gently.

Direct / Indirect Method: It combines both the above methods. The screen is laid down the stencil film with the emulsion side up. A photo-sensitive polymer emulsion is squeezed through the mesh with the help of a squeegee on the film. When the transfer medium is dry the baking sheet can be removed and the screen is ready for exposure. Then the screen can be processed and exposed in the same way as in direct method. *This process should always be carried out in a dark-room under a red or ruby 'safe-light'.*¹⁴

Printing Process

Registration is very important during printing. Firstly, attach the frame to the printing table and check the registration marks by placing a blank sheet beneath the screen frame and position it in relation to

the stencil. Mark the registration marks / margins on the table for correct placement of sheets during printing and also on the screen for color printing. This will remain throughout the printing progression.

Prepare the color in the desired shade and consistency. Now place a blank sheet on the printing table and lower the screen over it. While standing at the opposite end, pour ink into the screen at one end and pull it with the help of a squeegee, thus spreading it evenly from one side of the frame to the other. Raise the frame to remove the sheet and keep it for drying. Repeat the process for further edition.

For multi-colored printing it is essential to decide how many colors are to be printed and then make a stencil and frame for each one. While printing a multi-color sequence it is suggested to print the color which represents the largest area first. When opaque inks are used, it is important to print lightest color first. *On the other hand, one must anticipate the way in which the colors will blend when they overlap.*¹⁵

Cleaning The Screen

After completing the printing process, clean the screen and squeegee with thinner and clean rags. Remove the excess ink in a tin so that it can be reused.

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Foot Notes

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