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Batik - A traditional surface ornamentation technique for textiles

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Batik work is one of the most popular surface ornamentation techniques on textile and leather in order to achieve value and aesthetic appeal. It is a method of creating patterns on the fabric surface using wax resist techniques and, historically, it is the most expensive and subtle of resist methods.

Batik is a thousand years old craft, whose origin is a mystery. It is assumed that the word Batik is derived from Javanese word *amba* i.e. to write and *titik* i.e. dot or point[1] and, in 1880, the word Batik was first recorded in English in the Encyclopaedia Britannica, where it was spelt as *Battik*. The traditional Batik work is found in various countries; however, the Indonesian Batik is best known for its intricacy and aesthetic look and, in the year of 2009, the Indonesian Batik had been awarded as a cultural heritage from UNESCO[2].

This ancient form of art involves creating fascinating patterns on fabric by alternating use of molten wax and dyes. The wax is used to impede the colour into the selected areas during dyeing, and thus the portions covered by wax retain their original colour. Removal of wax produces a contrast between the dyed and resisting portions to create an extraordinary pattern. The process of waxing followed by dyeing is repeated on the same fabric with different colours to create elaborate and vibrant designs. In one form or another, now-a-days, batik has gained popularity and is not only used as a material to cover the human body, but also in furnishing fabrics, heavy canvas, wall hangings, table cloths and household accessories. One of the significant features of this art is its simplicity and that it offers immense possibilities for artistic freedom as patterns are applied by actual drawing rather than by weaving with thread.

Archaeological evidence shows that, in the early days, Batik work was mainly done in Egypt, Persia, India, China, Japan and Southeast Asia. The most intricate batik is found in the Island of Java in Indonesia. Initially, this art form was practised in Java only for royal families and wealthy people[3].

Batik work is the most expensive and subtle of resist methods

Historical evidence shows that, during 1921, batik work was carried out in Malaysia, which had a significant contribution to the economic and business opportunities in the rural areas of that country[4]. During 1835, the Dutch brought Indonesian craftsmen to the several factories in Holland for showing this craft to the Dutch people[5] and, in 1940, the Swiss produced imitation batik. A wax block sort of printing was also developed in Java employing a cap. Batik on silk fabric was practised in China as early as the Sui Dynasty (AD 581-618) and also in Japan during Nara period (AD 710-794) with the help of screen. They mainly used trees, animals, flute players, hunting scenes and stylised mountains as the source of design inspiration for Batik[6]. During the first phase of twentieth century, Batik work was practised in Germany too. Evidence of very old cotton batiks was found in the Ajanta caves in India. The pattern noticed in the garments of the figure found in debris temples of Java and Bali resemble with Batik work.

In India, the roots of Batik are often traced to the first century AD and, during that period, the Khatri community of Gujarat were the only set of artisans for this art. It is believed that the best Batik designs in India came from the artisans of Cholamandalam near Chennai, and Gujarat. Rajasthan, Andhra Pradesh, Maharashtra, West Bengal and Madhya Pradesh are also famous for Batik work. In 1927, Rabindranath Tagore went to Java and noticed this exquisite art and thus the revival of Batik in India began at Santiniketan during the twentieth century[7]. It was first started by Sri SurenKar in Kala Bhavana, who travelled with Tagore. Pratima Devi was closely connected in this process and she accelerated this in Vichitra Karu Sangha prelude to Silpa Bhavana. This technique was evolved by the hands of the local artisans and gradually spread across the country. In Santiniketan, leather batik is also very popular and has a huge export market.

The design has been changed in accordance with the market demand, but, in Indonesia, the Island of Java still produces exquisite materials and wall hangings decorated by this process, richly ornamented and very often of the artistic merits; whereas African batik is mostly decorated with tribal pattern. Tagore and his companions had used brush to paint wax on the fabric for creating intricate floral and paisley design. The techniques used have also been evolved with time, and screen printing method is employed now-a-days for making beautiful designs, but some artisans still prefer hand batik.

Materials

Fabric

The cloth used for batik should be strong enough to bear the heat and wax. Batik is mainly done on natural materials, viz. cotton and silk fabric, due to good absorbing power. These fabrics can absorb the wax very easily. In recent times, other fabrics like georgette are also used.

Resisting agent

Beeswax and paraffin wax are mainly used as resisting agents in batik work. Both are used in accordance with the design. Beeswax, in its purest form, is yellow in colour and produced by honey bees and is collected from a beehive. It is soft and acts as a strong shield against the dye. It does not allow dye to sweep through. On the other hand, paraffin wax is hard and brittle. The crispness and brittle quality of this wax allows it to form more cracks in the waxed area. Therefore, it is mainly used for creating cracks. A higher proportion of paraffin wax in the mixture results in more cracks. This proportion may change according to the design and fabric construction. Some time, a natural resinous substance obtained from the stem of *Pinusroxburghii Sarg* is also mixed along with wax in a small quantity.

Dyestuffs

It is very essential to select appropriate dyestuffs for batik work. Dyestuffs which can be applied in cold or room temperature can be used for this purpose. Naphthol colour, solubilised vat dye, Remazol class of reactive dye and natural dyes can be used as dyes for batik.

Different tools are used for painting on the fabric with wax.

Canting (Tjanting pen)

Canting is the traditional method of applying wax on the fabric by hand. It is a pen-like tool with a metal cup to hold the molten wax with a tiny spout at the far side to drip the hot wax. The canting is used to drip molten wax over the pre-drawn pattern lines. It is popularly called batik tuli, i.e. to write, and the canting tool is used like a writing tool[8]. The process requires skills with precision because sometimes the patterns used in the batik are very complex.

Colet (brushing)

It is quite similar to painting with colours using a brush. After painting, a coating is applied over the final artwork to prevent the colour from bleeding during wax removal or subsequent washing. Artists are experimenting with this technique to produce more colourful works. Traditionally, the painted portion is covered with wax, followed by dip-dyeing of the background colour. Now-a-days, artists are also using brush to apply colour on the background, which results in bold and more expressive contemporary artworks.

Scratch technique

Scratch wax batik is an easy way to achieve both linear and various colour gradations with only one dye. In this technique, at first, fabric is coated with wax and the design is scratched over it. This technique is not so popular due to restricted use of colour application.

Apart from the above tools, blocks/ stamp made of wood or copper, brush etc are also used for application of wax on the fabric surface.

Vessels for heating the wax, plastic bowls or buckets to mix the colours,

heating arrangement for wax removal, table with sand and a frame to fix the cloth are also required for the batik work.

Methods

Preparation of fabric

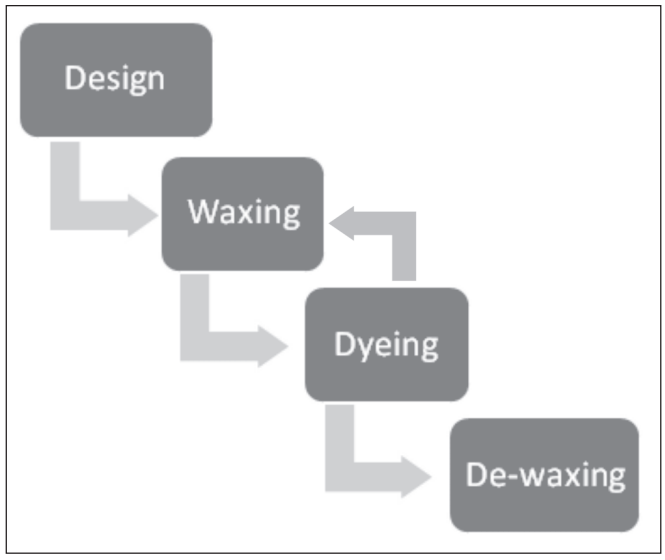
In early days, traditional methods of removing the impurities from the natural fabric were followed in order to make the cloth more absorbent. But, presently, conventional process of removing the impurities is more beneficial in terms of cost, time and quality. In case of cotton fabric, scouring and bleaching process is performed in presence of sodium hydroxide, hydrogen peroxide, sodium silicate, sodium carbonate, turkey red oil and detergent per the standard procedure; whereas, for silk fabric, soap-soda methods of degumming is popularly used to remove the silk gum or sericine. This removal of natural and added impurities prior to the application of wax helps the fabric to be more absorbent.

Batik work

It is a method of dyeing fabric by blocking selected areas with wax. The fabric covered by wax resists the penetration of dye, and this process of waxing followed by dyeing is repeated on the same fabric with different colours. Batik work can be done in four steps:

Design

After removing the impurities, the drawing is traced out on a fabric as per theme, mood and design. At first, the design is traced on tracing paper and, with the help of a needle, holes are created evenly along the outline of the design including the intricate line. Holes should be made evenly and close to each other so the design can be traced clearly and neatly. The fabric is then placed on a hard and plain surface. Tracing paper is then attached on the fabric with the help of pin or tape. The solution of kerosene and blueing agentis



Batik work

then rubbed on the transparent sheet with the help of sponge or cotton, and thus the design is transferred to the fabric. The tracing paper is then removed carefully in order to get the final design on the fabric. Tracing is required for applying wax evenly.

Waxing

It is a process of applying wax over the drawing areas according to the design. The waxing process is done in steps from the lightest to the darkest one. If the design consists of four colours, viz. white, yellow, red and black, then at first wax is applied to the white portion and subsequently dyed with yellow colour. In the next stage, the yellow portion is waxed and dipped in red colour, and finally red portion is waxed and the cloth is finally dipped in black colour. There are different techniques used for waxing.

Splash: This is the easiest process of applying wax on the fabric. In this process, wax is splashed over the fabric in a random fashion and dye is applied over it. This technique results in a virtual explosion of random designs and colours.

Block printing: Traditional batik work is done by hand, which is a time consuming process. Hence, in order to increase production and make the fabric more affordable to the masses, the cap (copper stamp)/block were developed. The cap/block is dipped into the molten wax and pressed on the fabric to transfer the design.

Screen printing: This method involves the use of a stencil to transfer the designs in an orderly and defined manner.

Hand painting: This is the most intricate and demanding methods wherein design and patterns are applied to the fabric using a Tjanting pen or Kalamkari pen, brush and canting.

Dyeing

Dyeing is done with the colorants which can be applied under room temperature and/or cold condition.

Naphthol colour: The colour belonging to this class are not ready made, i.e. they cannot be readily taken in aqueous medium for application. This is an ingrain class of dye and also termed as azoic colour/ice colour/ magic colour. This possesses allround colour fastness property except bleaching, and can be applied in cold condition within a short time. Due to this, the colour is very popular amongst the artisans working in this profession of batik work. Different class of naphthol and base combinations can produce varieties of shades. Sometimes, artisans prefer to use fast colour salt instead of base due to its easier application methods, although the storage stability of fast colour salt is poor and requires more quantity as compared to base. Sodium hydroxide, turkey red oil, sodium nitrite, hydro-chloric acid, sodium acetate and acetic acid etc are used during the various stages of dyeing with naphthol colour. It is advisable to use less quantity of sodium hydroxide for dissolution of naphthol in cold condition when silk fabric is used.

Dyeing of fabric with azoic colour involves the following steps:

- Preparation of Naphthol solution

either by hot or cold dissolving method. Sodium hydroxide is used for dissolution of naphthol.

- Application of soluble sodium naphtholate onto the fabrics.
- Diazotization of base with the help of sodium nitrite and hydrochloric acid. If fast colour salt is used, then the process of diazotization is eliminated.
- Application of naphtholated fabric with diazotised solution and colour is developed.
- Aftertreatment with detergent at boil to remove unfixed pigments and wax.

A standard recipe is given below. This may change according to the naphthol and base combination, fabric quantity, depth of shade required etc.

Recipe:

Weight of the fabric	(x) kg
Fabric to liquor Ratio	1:30
Naphtholation	
Naphthol	(y) gm/l
Caustic soda	1 gm/gm naphthol
TR oil	0.25 gm/gm naphthol

Diazotization process:

Base	Amount of Napthol x coupling ratio x % exhaustion
Hydrochloric acid	2 gm/gm of base
Sodium nitrite	0.5 gm/gm of base
Acetic acid	0.75 gm/gm of Base
Sodium acetate	0.5 gm/gm of base

Solubilised vat dye: Solubilised vat is sodium salt of sulphuric ester of leuco vat and readily soluble in water. It is mainly used for producing light shades on cellulosic or protein-cellulosic blended materials. It is costly as compared to other classes of dyestuffs, but has allround colour fastness properties. Glycerine, sodium nitrite, hydrochloric/sulphuric acid etc is used during the dyeing process. It is preferable to use sulphuric acid in case of silk. This dye is becoming popular now-a-days in batik work.

Recipe:

Solubilised vat dye	(x) % (owf)
Glycerine	half of dye
Sodium nitrite	equal of dye
Temperature	40°C
Time	30 min.

After dyeing, the fabric is passed through a bath containing hydrochloric acid (20 gm/l) for cotton and/or sulphuric acid (20 gm/l) for silk at 40°C for 5-10 min. After development, the dyed fabric is washed with non-ionic detergent at boil in case of silk and anionic detergent for cotton.

Reactive dye: Now-a-days, batik work is performed with reactive class of dyes. Among the various classes of reactive dyes, Remazol i.e. vinyl sulphone is used for this purpose.

Natural dyes

The dyeing and printing of textiles with natural dyes is one of the oldest known to man and practised dating back to the dawn of human civilization[9]. In most cases, natural dyes are eco-friendly, renewable, biodegradable in nature and also provide health benefits to the wearer. In early days, batik work with colorants obtained from natural resources were very popular, but after the commercialisation of synthetic dyes along with their easier application process, wider colour range and market demand has forced the artisans to use this dye in place of natural colour. But, with the increasing global awareness about the importance of saving earth as well as great appreciation for the values of local wisdom and culture, have revived interest of using natural dyes in batik work and this has opened up opportunities in domestic and international markets.

Natural dyes are available in the market in crude and powder form. The dye is obtained after extraction of natural resources in water. The dyeing of wax coated fabric can be done either following post- or simultaneous mordanting methods. In simultaneous mordanting, appropriate quantity of mordant is mixed with the dye solution and kept for 30 min at room temperature. The wax coated fabric is then impregnated in this solution for 5-10 min at room temperature, followed by drying and steaming at 102°C for 30 min. In post mordanting method, the wax coated fabric is dipped into the aqueous extract of natural dye, followed by treatment with mordant. In certain cases, waxing can also be done after dyeing and drying. This wax coated fabric is then crushed for creating crack effects and again immersed in another solution of natural dye and mordant. In all the cases, drying and steaming is essential.

Wax removal

At the end of the batik process, wax should be removed properly. In order to remove the wax, the fabric is boiled in water along with sodium

Batik work done by the students at IIHT Guwahati, Assam, India

carbonate and detergent. In case of natural dyes, non-ionic detergent and emulsifying agent is preferred for removing wax from the fabric. After the removing of wax, the motifs that have previously drawn will be visible.

Problems associated with batik work

Batik is a traditional craft, but this industry generates pollution for the environment due to use of naphthol colour and other restricted chemicals. Batik is mainly done by the artisans and small enterprises, and the discharge effluent from their unit contaminates the water and subsequently causes severe water pollution. Hence, there is a need for an alternative ecofriendly route in order to sustain this rich cultural heritage. The concept of sustainable development is the buzz word now-a-days due to growing consciousness for environmental issues along with other socio-economic problems and industries to develop a sustainable production system.

Conclusion

Batik is the art with high artistic value with an ancient culture. It is basically a fusion between art and technology. It offers more freedom to a designer for creating enormous number of patterns and also experimenting with materials to create something from their own efforts. Thus, batik work is not limited to any acceptable products. Batik has a limited scope for dyes because of limitations of application conditions. However, Batik has an enormous potential as an art and culture and has high possibilities in domestic and export markets. Traditional batik is very laborious and labour intensive. It needs skilled manpower which increases the cost of production and is thus suitable only for producing speciality products in the cottage sector. The removal of wax is not an easy process, hence the reuse of the removed wax is very essential; but the reused wax can contaminate the fabric. In this context, the traditional methods of batik work is threatened by printed batik with the help of screen and block. The major challenges to the batik work are less production, labour intensive, limitation of dyes, and pollution. The customer's interest for batik products can be created through promotional campaigns and advertisements.

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