

# STUDY MATERIAL

## UNIT I

### TEXTILE CHEMICAL PROCESSING

#### Learning Outcome

After finishing this unit, students will be able to understand –

- Various technical terminology used in the industry.
- Various types of impurities presents in the substrates.
- The processes involved in removing impurities.

#### Overview

In this chapter students will get to know about various techniques of preparatory process of textile material which is the essential part of the processing. Without preparatory process it is very difficult to achieve the desire result in the dyeing, printing and finishing process.

After studying this chapter, the students will be familiarized and will be able to understand terminology used in the Industry, impurities present in natural and synthetic fibers (Raw Cotton, Wool, Silk, Polyester, Nylon and Acrylic) and their effective and cost economic removal.

This unit also deals with Chemical Processes, Chemical Treatment, Process Flowcharts of Cotton, Wool, Silk and Synthetic fibers, Elementary Knowledge of Sizing, Resizing, Scouring & Bleaching. After understanding these terminology students will be able to know the processes involved in achieving desired fabric quality.

## **INTRODUCTION TO CHEMICAL PROCESSING: PRE-TREATMENTS**

### **1.1 TEXTILE CHEMICAL PROCESSING FOR THE FIBERS (PREPARATORY OPERATIONS)**

Newly constructed fabric as it comes from the mill is called gray good. This does not imply that the fabric is gray in color, it simply denotes any unfinished fabric. The goods must pass through various finishing processes to make it suitable for its intended end use. Finishing may change the appearance of the fabric, its hand (feel), its serviceability, and its durability.

Gray goods must be cleaned before they can be finished. They may contain warp sizing, oils, other additives, dirt, and soil. Complete removal is necessary in order to finish, dye and/or print goods effectively. The method of cleaning depends upon the fiber in the fabric, the kind of impurities present, and the construction of the fabric. For example, cotton may be mercerized, wool is scoured, silk is degummed.

The fabric collected from various weaving setups, cannot be used directly for manufacturing various textile products. There are number of impurities present in the fabric such as dust, dirt, oil stains, oil and waxes, starches or other sizing materials, seed particles, and natural coloring materials.

### **1.2 IMPURITIES IN NATURAL AND SYNTHETICS FIBERS:**

I. Natural Impurities &

II. Added Impurities

**Natural Impurities:** - Natural impurities are generally presents in the natural fibers in the form of oil, waxes, natural color, vegetable matters (such as leaves particles, Seed particles, etc.), Dust particle. In case of wool sweat is also considered as impurities which are deposited on the sheep's or goat's hair.

**Added Impurities:-** These type of impurities are manually added to the yarn or fibres during the manufacturing process to increase the efficiency of the weaving process such as, Sizing materials (which includes starches, or polyvinyl alcohol are applied on the surfaces of the yarn to reduces the breakage of yarn during the weaving operation and increase the weaving efficacy.) Spin finishes are another example of the added impurities. These types of impurities are generally added to synthetic yarns which contain Antistatic

agents and Lubricants. Which reduces the statics charge buildup and friction during the weaving operation.

These impurities make fabric hydrophobic in nature and limit the fabric for further processing.

**The main objectives of preparatory treatments of textile materials are,**

- To remove all the impurities, both naturals and those added during production that may interfere in subsequent dyeing or finishing process.
- Improve the ability of the fibers to absorb water, dyes solutions and chemicals.
- Impart proper brightness or whiteness to fabrics according to need, especially when brilliant or pastel shades are desired.

### **1.3 ELEMENTARY KNOWLEDGE OF PROCESSING:**

All of these impurities cannot be removed by a single operation. It requires sequences of operations, which is called Processing. All the operations before the dyeing of fabrics are called Preparatory Process or Pretreatments. This pretreatment includes Singeing, Desizing, Scouring, Souring, Bleaching and Mercerizing. All of these Operations have the specific objectives and it is not necessary to use all the operation to all the fabrics. It generally depends on the type of fabrics, contains of the fabric and the end uses of the fabric.

### **1.4 DIFFERENT PROCESSES E.G. SINGEING, DE-SIZING, SCOURING, BLEACHING AND MERCERIZING:**

**Singeing:** During the weaving operations, warp yarns pass through held wires, and reed. It is continuously under friction during weaving process. Due to continuous friction, yarn develops hairiness. This hairiness is undesirable in the fabric and provides an unpleasant feel to the fabric or garment.

The main objective of the Singeing is removal of protruding fibers from both sides of fabric. For this purpose, the fabric is passed through singeing Machine in open width, flat and under tension. Fabric is passed over an open flame at a high speed (300 yards/min) to prevent scorching. Uneven singeing leads to unlevelled dyeing.



***Pic.: Plate Singeing Machine***

***Pic. : Singeing Machine***

### **De-sizing**

Size is added during the weaving preparatory process. Main objective of the sizing is to provide strength to the yarn. This improves the weaving efficiency by reducing the yarn breakage. After the weaving is completed, the size material is undesirable in the fabric and it makes the fabric stiff and hydrophobic in nature. The main objective of the De-sizing is removal of starch from fabric. For this purpose, the fabric is impregnated in the de-sizing bath and stored for 8-12 hrs. The Impregnating bath contains required amount of enzyme, Wetting agent and Sodium Chloride (NaCl). After this process, fabric is thoroughly washed with hot water.

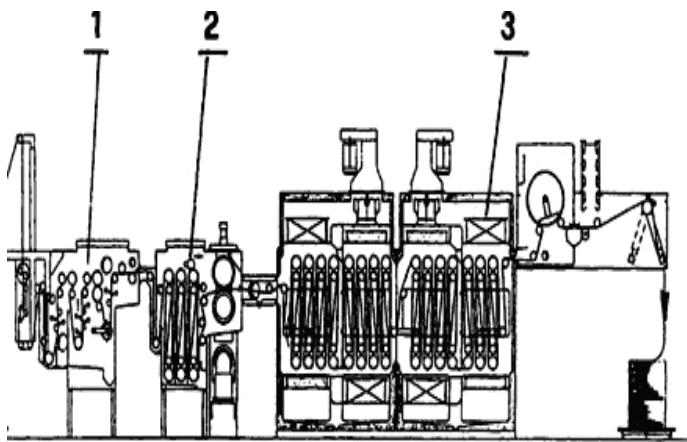
In Enzyme application of De-sizing, the fabric padded with enzyme bath is then passed through steam of 96-100°C temp. This is a rapid process in which De-sizing process complete in less than one minute. The main advantage of De-sizing with enzymes is that there is no risk of damaging the fibres. The process is an eco- friendly and relatively expensive.



## Scouring

The yarn made of natural fibres contains natural oils and waxes. These oils and waxes make fabric hydrophobic and do not allow dyes and chemicals to penetrate into the fibres. The Scouring is a cleaning treatment in which oil, waxes and residual sizes are removed from the fabric by the chemicals. After scouring the fabric becomes absorbent in nature

In this process, fabric is treated with strong alkali solution (5-10 gm/lit NaOH or mixture of NaOH & Sodium Carbonate) close to or above the boiling temp. for 1-2 hours with hot rinse and final cold rinse with acetic acid. The final rinse with acetic acid is also called souring process.



***Pic.: De-sizing & Scouring Machine***



***Pic.: De-sizing & Scouring fabric***

## Bleaching

After scouring process, the fabric is free from oils and waxes, however natural coloring matter are still present in the fibre. If this colour is not removed at this stage than it will be very difficult to attain the desired shade in dyeing process.

The main objective of the bleaching process is removal of natural coloring matter and to make the fabric perfect white with minimum damage to fibres and within the shortest possible time. Bleaching is generally carried out by oxidative process. Some of the examples of the Bleaching agents are: Sodium hypo chlorite, Sodium chlorite and Hydrogen peroxide. Hydrogen peroxide is also called as “Universal bleaching agent”. Since, it is a very mild bleaching agent, It is used for almost all type of cotton, polyester/ cotton blends and silk fabrics.



***Pic.: Before Bleaching***



***Pic.: After Bleaching***

Peroxide bleaching is carried out generally near or above boiling temperature, under pressure, for one hour or more. After bleaching, the fabric is thoroughly rinsed with slight amount of basic solution to avoid formulation of insoluble salts of silicates.

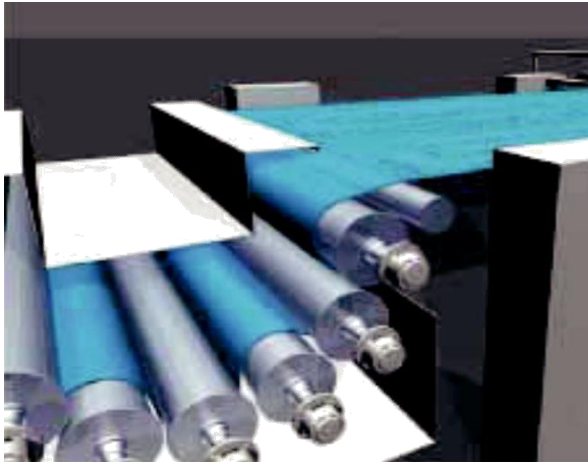
After bleaching, fabric may be sold as perfect white cloth. For achieving perfect white cloth, fabric is treated with Optical whitening Agents, such as Tinopal , Ranipol etc and blueing agents such as Robin blue, Ujala etc.

## **Mercerization**

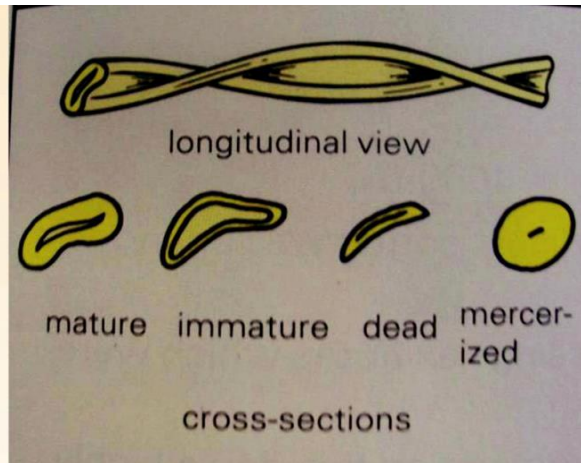
Mercerization process was invented by John Mercer. He was a young chemist. One day, while he was filtering some chemical solution using cotton cloth, he observed some changes in the cotton fabrics. He studied the changes in detail to standardize the process. In the Mercerization process, cotton fabric or yarn is treated with a cold concentrated solution of sodium hydroxide for one minute or less. In this process cotton fibers swell, untwist and their bean shaped cross section changes into a round form.

Mercerization improves the following properties of the cotton fabric.

- Strength would be increased to 15-25.
- Enhanced luster.
- Greater affinity to water dyes and other chemical finishes.
- Shrinkage control in both the direction of the fabric.



***Pic.: Fabric passing through Mercerization solution***



***Pic. Cross Sectional changes in Cotton***

Fabric is padded with about 20-25% NaOH solution containing a wetting agent. Fabric is passed over several cans to allow a dwelling time of approximately one minute.

During this time, NaOH will penetrate the fibres and react with them. At this stage the tension is applied lengthwise. The fabric is then placed on a “Stenter” machine and is pulled to its desired dimensions.

## Exercise

### Fill in the blanks

1. Removal of protruding fibers from both sides of fabric is called as . .
2. Removal of starch from fabric is called as . .
3. .... treatment removes oil, waxes and residual sizes from the fabric.
4. Objective of the.....process is to remove natural coloring matter to make perfect white fabric.
5. Hydrogen peroxide is also called as . .
6. The treatment of cotton fabrics or yarns with a cold concentrated solution of sodium hydroxide solution for one minute or less is called.

### Short answer questions

1. What are the chemicals used in De- Sizing?
2. What are the chemicals used in Scouring?
3. What are the chemicals used in Mercerizing?
4. What are the chemicals used in Bleaching?
5. What are the main objectives of preparation treatments?
6. What are the main objectives of De- Sizing?
7. What are the main objectives of Scouring process?
8. What are the main objectives of Bleaching process?
9. What are the main objectives of Mercerizing process?

## UNIT - 2

### Textile Dyeing

#### Objectives

- To introduce the technique of resist dyeing for value-addition.
- To create awareness about the different resist dyed textiles of India.
- To understand the origin of technique and design with reference to resist dyed textiles.
- To learn about the evolution of resist dyeing over a period of time.

#### Learning Outcomes

***After completing the unit, the students shall be able to***

- Understand the finer nuances of resist dyed textiles.
- Classify the regional tie-dyed textiles of India.
- Identify specific tie-dyed textiles of India on the basis of technique, colours, patterns and layout.
- Identify the influencing factors for development and evolution of a specific resist-dyed textile.

#### UNIT OVERVIEW

In this unit we will learn about the two major resist dyeing textile techniques of India: Bandhani or Bandhej in terms of process, production centres, colours, patterns and layout.

Resist dyeing is a technique of colouring yarn or fabric in order to create a pattern by blocking or resisting certain areas, so that only the unblocked areas receive colour. Resist materials like thread, wax, rice or mud paste can be used keeping in view the patterns.

**Traditional resist dyed textiles of India can be broadly classified into two categories:**

- *Bandhani or Bandhej - Cloth resist dyed textiles*

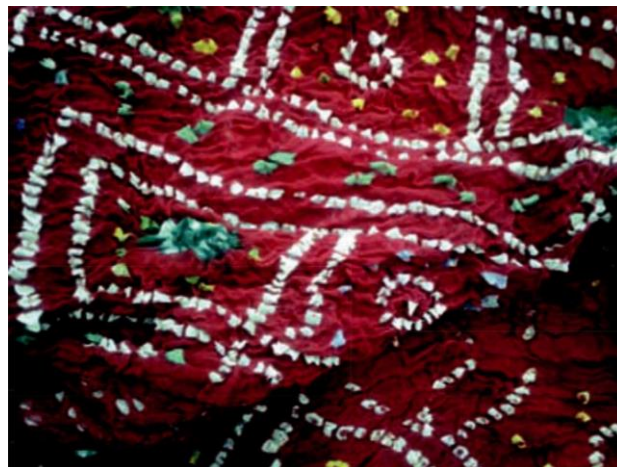
Bandhani, derived from the word 'bandha' which means to tie, are tie-dyed textiles primarily from Rajasthan and Gujarat. Tie-dye is a resist dyeing technique in which pre-determined areas on the fabric are tied tightly with thread to protect them from the colour, followed by dyeing and removal of threads to reveal an interesting pattern on fabric.

The earliest reference to bandhani dates back to 6<sup>th</sup>-7<sup>th</sup> century ad at the ajanta cave paintings that portray women wearing bodices with resist dyed designs. There is a literary reference to bandhani textiles in Harshacharita written by Banabhatta in 7<sup>th</sup> century ad. The biography quotes the wedding of King Harsha's sister, Rajyashri and details the tie-dyeing of the bride's *odhani*.

The word 'chunari' is a commonly used term that refers to patterns created by fine tie-dyed dots. Since the resist dyeing is done on head-cloths, *chunari* is also the name of the garment worn by women in rajasthan (Pic. 2.1).

**The basic steps of creating a bandhani textile are as follows:**

**Pre-preparation of fabric:** The fabric generally used for tie and dye is finer variety of cotton and silk, so that dye can penetrate deep into the layers of tied fabrics. It is soaked in water overnight and washed thoroughly to remove the starch in order to improve its dye uptake. The fabric is bleached by drying it in the sun.



Chunari- head cloth worn by women of Rajasthan



- **Tracing of design:** The fabric is folded into four or more layers for convenience of tying as well as to achieve symmetry in design. The design layout is marked on the folded fabric with wooden blocks, dipped in washable colours like *neel* or *geru*.
- **Tying of fabric:** as per the design, the folded fabric is raised with a pointed metal nail worn over the finger. A cotton thread coated with wax is wrapped tightly around the raised area to create a simple fine dot: *bundi* or *bindi*, which is the basic motif of the design.
- **Dyeing of fabric in the lightest colour:** after tying, the fabric is dyed in the lightest colour first from the selected colour scheme. After dyeing, fabric is washed, rinsed and dried.
- **Renewal of tying and dyeing in next-darker colour:** Parts of the fabric to be retained in the lighter colour are covered with tying and then the fabric is dyed in the next darker colour. The Process of re-tying and dyeing is continued till the darkest colour in the scheme is applied.
- **Washing:** Following the final dyeing, the textile is washed to remove excess dye and starched.
- **Opening the ties:** The ties of the tie-dyed fabric are kept tied till purchased by a consumer in order to differentiate between a bandhani textile and a printed imitation. Only a portion of the bandhani textile is opened to display the colour scheme to the customer. To unravel the ties, the bandhani textile is stretched crosswise to open all ties at the same time.

The tie-dye in India can be categorized according to region into Bandhani of Gujarat and Bandhej and leheriya of Rajasthan

## **BANDHANI OF GUJARAT**

The tie-dye from Gujarat called Bandhani is regarded for its fine resist dots and intricate designs. Traditionally the tie-dye is done on silk, cotton and wool. The motifs created by outlining with tiny dots are animal and human figures, flowers, plants and trees. The products range varies from *odhanis*, saris, shawls to stitched garments like *kurta* and skirts (Pic. 2.2).

The major centers of bandhani in Gujarat are Jamnagar, Bhavnagar, Rajkot and Porbandar.



Bandhani woolen shawls

### SPECIAL BANDHANI TEXTILES FROM GUJARAT

**Gharcholu:** a popular bandhani textile produced in Gujarat is called *gharchola* or *gharcholu*, a traditional *odhani* for Hindu brides, which is nowadays available as a sari worn on auspicious occasions. The tie-dyed textile in cotton or silk is red in colour and the layout is a checkerboard created with woven gold threads. Each square within the check contains a different tie-dyed motif like dancing lady, parrot, elephant, peacock, flowering shrub and geometric forms (Pic. 2.3).



Cross view of Gharcholu



**Chandrokhani:** The traditional *odhani* for a Muslim bride in red and black colour is called *chandrokhani*. It is a tie-dyed textile with a big medallion in the center surrounded by four smaller medallions and wide borders (Pic. 2.4). Motifs created with small tie dye dots are small paisleys, zig zag lines, sunflowers etc.



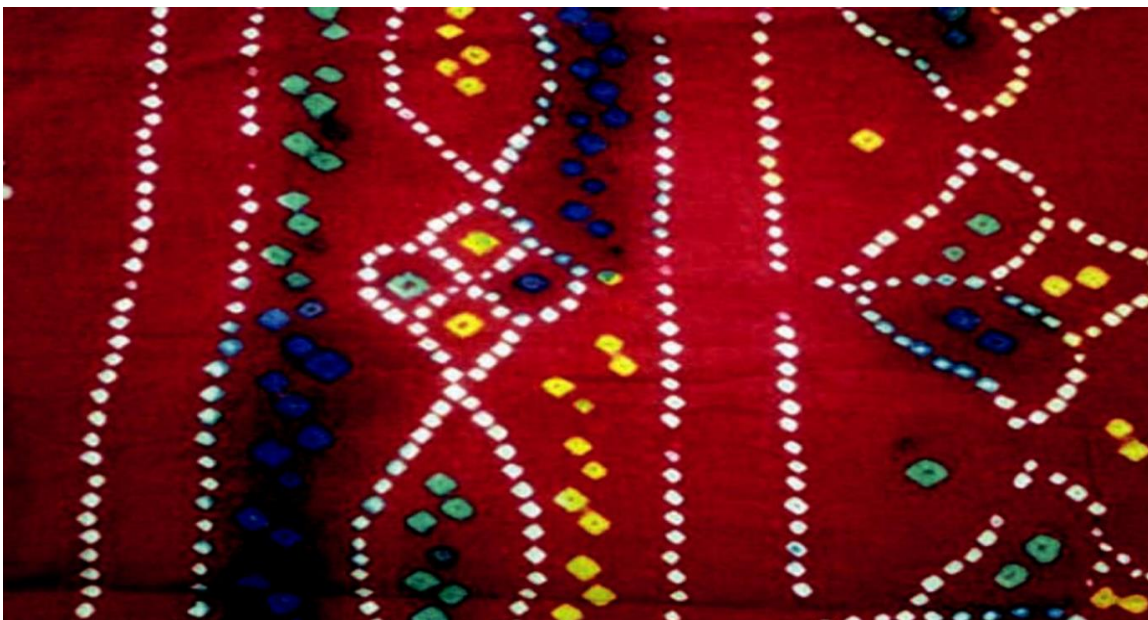
Croose view of Chandrokahni

**Aba or Abo:** The traditional upper garment for Muslim women is called *aba* or *abo*. The *kurta* has an intricate tie-dye pattern shaped like a yoke on the bodice front, which is identical in the front as well as the back.

## Bandhej and Lehariya of Rajasthan

The tie-dyed textiles produced in Rajasthan are known as bandhej and are similar to the bandhani of Gujarat in terms of production process. Besides the fine resist dots, other types of shapes seen in bandhej are tiny boxes called *dabbi*, sweetmeats termed *laddu* and cowrie shells named *kori*. The tie-dye motifs range from very simple to complex forms including geometric and floral designs. The tie-dye done on fine cotton and silks are used as *odhani* for women, turban cloth for men and stitched into garments like skirt and bodice. The colourful textile that is considered auspicious is also offered to goddesses on special occasions.

Rajasthan is also known for its multi-coloured resist dot pattern that is produced by a process called 'lipai' (Pic. 2.5). In this technique, the fabric is first dabbed with various colours according to the design, followed by tying the coloured areas to resist penetration of dye. The tied fabric is finally dyed in order to obtain multi-coloured dots in localized areas on a coloured background.



Multi-coloured resist dots pattern

Another category of tied-dyed fabrics which are very popular from Rajasthan are lehariya (Pic. 2.6). The patterns are diagonal or zigzag lines created by wrap-resist technique. Fine cotton or silk fabric is diagonally rolled into a tight rope and tied with thread at regular

intervals to obtain stripes on dyeing. The fabric may be rolled again and re-tied to resist the existing colour and add another colour in the leheriya pattern. The fabric when opened fully shows diagonal white and varied light coloured lines on a darker background. leheriya fabrics are used as head cloth

The finest bandhej is made in Sikar and Bikaner in Rajasthan. Other production centres for bandhej and leheriya are Jodhpur, Udaipur, Barmer and Jaipur.



## **SPECIAL TIE-DYED TEXTILES FROM RAJASTHAN**

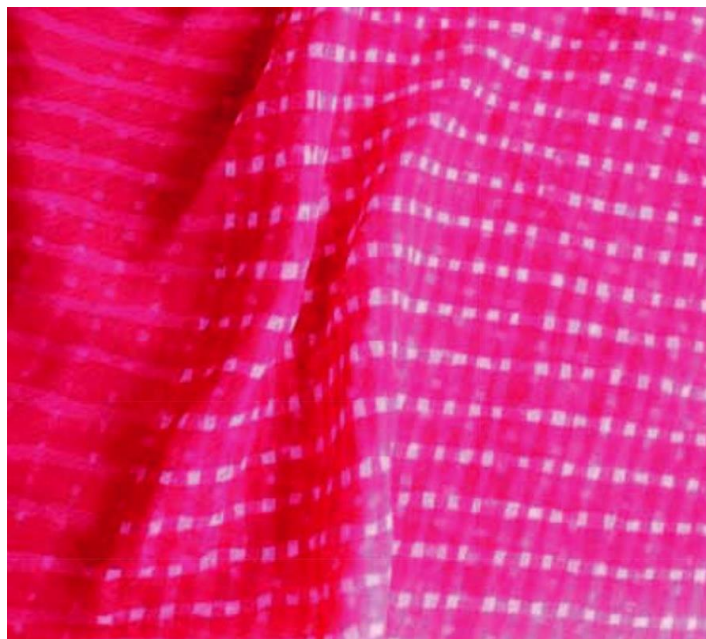
**Piliya/Pilado:** The traditional odhani in red and yellow colour scheme is an important part of the costume for young mothers. These textiles were dyed with turmeric to impart properties of anti-inflammation. Hence it had social significance as they were gifted to the mothers of new born boys. a typical piliya is largely yellow in colour with red appearing in borders, big central circular motif and four smaller circles around it (Pic. 2.7).





**Close view of Piliya**

**Mothra:** A traditional leheriya textile that has a fine checkered pattern created by crisscrossing diagonal lines.



**Close view of Mothra**

## **DYES**

To select the proper dye for a fiber, it is necessary to know which dyes have an affinity for the vegetable, animal, or manmade fibers. In general, the dyes used for cotton and kinen may be used for rayons, but other fibers require different dyes.

When a dye colors fiber directly with one operation of impregnation, without the aid of an affixing agent, the dye is said to be a direct dye for that fiber. Direct dyes are the easiest to produce, the simplest to apply, and the cheapest in their initial cost as well as in application.

## **SELECTION OF DYEING METHOD**

Textiles may be dyed at any stage of their development from fiber into fabric or certain garments by the following methods:

Stock dyeing, in the combed wool sliver stage.

Yarn dyeing, after the fiber has been spun into yarn

Piece dyeing, after the yarn has been constructed into fabric

Solution pigmenting or dope dyeing, before a manmade fiber is extruded through the spinneret

Garment dyeing after certain kinds of apparel are knitted.

### **Stock Dyeing**

In this process of dyeing, loose fibers are dyed by circulating the dye liquor continuously through fibers.

#### **Important Features of Stock Dyeing:**

- Expensive method of dyeing
- Production is less
- 10-15% waste of dyed fibers during dyeing
- Excellent penetration of dye in to fiber

Fashion risk - It means that final color of the fabric has to be decided in earliest stage in its manufacture

**Reason for use:**

- Heather-like effect for woolen yarns or to produce “Melange yarns”

**Yarn Dyeing**

In this type of Dyeing machines, dyeing is carried out in yarn stage. There are various types of yarn dyeing machines; such as Slacer Dyeing Machine, Rope Dyeing Machine, Hank dyeing Machine, Package Dyeing and Space dyeing.

**Important Features of Yarn Dyeing**

Some of these dyeing machines are cheaper than Stock Dyeing Machine:

- Excellent color penetrations of dye into fiber than piece dyeing

**Reason for Use,**

- To produce stripes, plaids and checks and other multi colored designs



### **Natural Dyes**

Primitive people obtained dyes from flowers, nuts, berries, and other forms of vegetable and plant life, as well as from mineral and animal sources. These sources out civilization. They are no longer used in quantity by the dyeing industry, but they are still used in Oriental countries to a certain extent for rug dyeing and in many parts of the world for native handicraft.

### **Synthetic Dyes**

Although synthetic dyes were first derived from coal tar in 1856, they were not developed in the United States to any great extent until World War I, when the supply of imported synthetic dyes was cut off. Since then, the United States has built up a dye industry that is unsurpassed. Innumerable dye compounds made from coal tar have now supplanted natural dyes. These synthetic dyes are constantly being improved as to beauty of color and color fastness. Lasting beauty of color is an important factor in consumer's finished goods. Durability of color depends on (1) selection of the proper dye for the fiber to be dyed (2) selection of the method of dyeing the fiber, yarn, or fabric.

### **Basic (Cationic) Dyes**

The first coal-tar was a so-called basic dye. It was developed to give many bright shades for silk and wool. The chemical agent that binds the dye to a fiber, which otherwise has little or no affinity for the dye, is known as a mordant. Cationic dyes are used with a mordant for cotton, linen, acetate, nylon, polyesters, acrylics, and mod acrylics. A fluorescent basic dye which imparts extremely bright shades has been developed in a wide range of colors. It is suitable for acrylics and certain polyesters.

When used on natural fibers, basic dyes are not fast to light, washing, perspiration, or atmospheric gases; they tend to either bleed or crock. They give good fastness and bright shades to acrylics for which they are principally used. Basic dyes are frequently used as an after treatment for fabrics that have been previously dyed with acid colors.

### **Piece Dyeing**

In this method, dyeing of cloth is carried out, after it is being woven or knitted is known as piece dyeing. It is the most common method of dyeing. The various methods used for this type of dyeing include jet dyeing. Jig dyeing, pad dyeing and beam dyeing. Dyeing is carried out in fabric stage, generally to produce single solid color in the substrate.

### **Solution Pigmenting or Dope Dyeing**

During the production of manmade fibers, a great deal of time and money can be saved if the dye is added to the solution before it is extruded through the spinnerets to filaments. This method also gives a greater degree of colour fastness. A Process called solution pigmenting, or dope dyeing, has been used for manmade fibers ranging from rayon through saran and glass fiber. Effective results have been obtained. The pigment colors are the fastest known-much faster than any of the customary dyeing techniques. Therefore, where warranted, they are to be preferred when fastness to almost any known factor is important.

Special dyes may be added to the polymer for the production of such fibers as nylon prior to melt-spinning of the chips. The dyestuffs are resistant to the reducing action of the polymer under high temperatures. Such dyes will not fade, crock, or run.



## Garment Dyeing

This type of dyeing is generally carried out for the garments of non-tailored categories, such as sweaters sweat shirts, hosiery and panty hoses etc. Tailored items like suits or dresses cannot be dyed as garments because the difference in shrinkage of the various components of the garments will provide the distortion and misshape the article. Garment dyeing is done by, placing suitable number of garments depending on the capacity of the machine into large nylon net bag. Loosely packed 10-50 bags are then placed in dye bath and kept agitated by a motor driven paddle. This type of machine is also called as “**Paddle dyer**”.

### Important Features of Garment Dyeing:

- Less fashion risk
- Material need not be dyed until shortly before the actual sale of the merchandise

### Limitations

- All fabric used in one garment must come from the same lot of fabric.
- Fabric must be tested for shrinkage before cutting of garments, and must be given required tolerance to allow for shrinkage so that size will be accurate.
- Thread must be selected carefully and tested to be sure it will accept the dye in the same way as the fabric.
- Labels, buttons and zippers must be compatible with the garment fabric in terms of reaction to the dye and shrinkage.



## Special Dyeing Effects

### Cross Dyeing

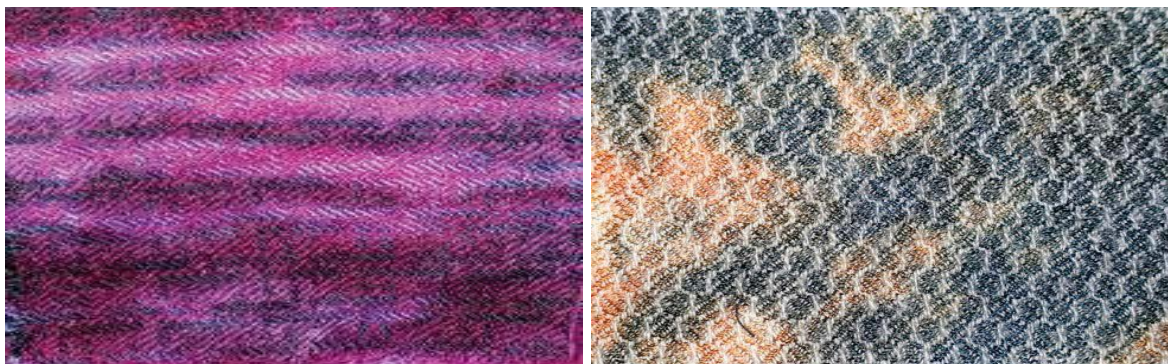
Yarn, fabric or even garment made with two or more generic fiber types “Blends” having different dyeing qualities is dyed a single dye bath containing different classes of dyes e.g. If a fabric is made of 67% Polyester and 33 % cotton fibres. In such case both the fibre requires two different classes of dyes. And if we choose one colour to dye the polyester fibre (say Yellow) than any colour other than yellow can be used in the to dye the cotton, then such type of dyeing is called Cross dyeing.

If different fibers are blended in the same yarn a Heather-like effect is obtained. Different fiber content yarns used in fabric construction can obtain plaids, stripes and checks.

### Union Dyeing

Union dyeing can be defined in the blended fabrics. If a fabric is made of 67% Polyester and 33% cotton fibres. In such case both the fibre requires two different class of dyes. And if we choose one colour to dye the polyester fibre than similar colour must be used in the same intensity to dye the cotton, then such type of dyeing is called Union dyeing.

It means that Union dyeing is achieving single solid color on blended fabrics.



***Pic. Cross Dyeing Fabric***

### The Selection of Dyes

There are various choices available to dye given fabric. The main criteria for selection of dyes depend upon the following factor.

- End uses of fabric.
- Fiber content.
- Fabric structure.

- Requirement of color fastness.
- Penetration and absorption of dyes.
- Cost of dye stuff.
- Methods of application etc.

### **Dyeing Objectives**

The main objectives of dyeing are.

- To impart color to the Textile substrates fibers, yarns, fabrics & garments uniformly and producing uniform leveling.
- To achieve acceptable durability of color to further treatments in production and normal end use.
- To reproduce the required shade from batch to batch.
- To use reasonably priced dyes and dyeing procedure.
- To provide and use ecofriendly process.
- Fixing the color in the shortest possible time.

## **Direct Dyes**

These dyes are derived from a formulation of Benzedrine salts. These are water soluble dyes and least expensive one. These dyes are easy to apply and can be applied directly on the fabric, without any pretreatment. Dye fixing agents are not required to fix this category of dye. These dyes are widely used on cellulosic fibers.

Direct dyes are having wide range of colors and shades. The fabric dyed with the direct dyes generally does not have bright colors. Among the bright colors, only bright greens are available, but is more expensive than any other color.

### **Application**

These are water soluble dyes; hence, can be directly applied on the fabric. These dyes have good color fastness to perspiration and dry cleaning. Light fastness of these dyes varies widely from poor to very good.

Some direct dyes are metalized with copper to increase their light fastness. In other cases, copper salts are applied as an after treatment for improving light and wash fastness.

These dyes have poor fastness to washing and crocking. Majority of the direct dyes are used as back ground color for discharge printing.

### **Azoic dyes**

This is the third group of direct dyes that is further identified as naphthol and rapidogen types. They are quite fast to washing and vary from poor to excellent light fastness. Azoic dyes are used to a very great extent on cotton and for special purposes on nylon and acetate.

The method of applying these dyes is somewhat similar to that of developed dyes, as it involves diazotizing. The fabric is first immersed in naphthol, which impregnates the fibers; it is then dipped into the diazotized color bath. The dyeing is followed by thorough soaping and rinsing. Naphthol or azoic dyes are sometimes referred to as ice dyes because ice is frequently used to bring the dyes to a low temperature and assure efficient dye formation. A complete color range is available, but these dyes are used primarily for bright reds, yellows, and blacks.

## **Sulfur Dyes**

Sulfur dyes, first made in 1879, are used for cotton and linen. These dyes are fast to washing, light, and perspiration, but they have one weakness: excessive chlorine bleaching will strip the color.

Sulfur dyes are insoluble in water and must be made soluble with the aid of caustic soda and sodium sulfide. (one or two manufactures produce sulfur dyes that have been made water-soluble.)

Sulfur dyeing is done at high temperature and with a large quantity of salt, which helps to drive the color into the fabric. Sulfur dyes penetrate more thoroughly than any other dye because of the high temperature and the alkalinity of the dye bath. They are excellent for khaki and for the heavy piece goods used in work clothes. Sulfur dyes produce dull colors, such as navy, brown, and black. They are used for black more than any other dye. If stored for a great length of time, fabrics become tender.

## **Vat dyes**

The first synthetic vat dye was an indigo created in 1879. Vat dyes are the fastest dyes for cotton, linen, and rayon. They also may be applied to wool, nylon, polyesters, acrylics, and mod acrylics with the use of a mordant. Vat dyes are not only resistant to light and to acids and alkalies, but are also equally resistant to the strong oxidizing bleaches used in commercial laundries. In this respect, vat dyes excel sulfur dyes, which are not fast to chlorine washing.

Vat dyes are expensive because of the initial cost as well as the method of application. They are insoluble pigments; but they are made soluble in water by the use of a strong reducing agent, such as hydroxide. The fabric is immersed in this solution. Subsequent exposure to air or immersion in an oxidizing bath (dichromate) restores the dye to its soluble form as a part of the fiber.

## **Disperse Dyes**

These dyes were originally developed for the dyeing of cellulose acetate but now days, they are used to dye nylon, cellulose triacetate and acrylic fibres too.

These dyes were largely used for dyeing of polyester material. Disperse dyes are Non-ionic aromatic compounds with relatively low molecular weight and has an extremely low solubility in water. These dyes are available in the form of powders, granular, liquid or paste form. These dyes can be sublimizing at higher temperature and this sublimation properties of Disperse dyes at high temperature is used in the transfer printing and rapid dyeing process.

Dyeing of polyester is generally carried out at high temperature and high pressure. These dyes are also used for heat transfer printing. Disperse dyes produces very good range of shades except dark blue and black. These dyes are having good - excellent fastness to perspiration, crocking and dry cleaning and Fair-Good fastness to light and washing. When these dyes are used on acetate, it exhibit poor fastness to light and subject to gas fading.

## **Acid Dyes**

These dyes are sodium salt of sulphonic acid that are having very good affinity to wool and silk fiber under acidic medium. These dyes are available in a form of salts and are water-soluble. These dyes are applied in acid medium by exhaust method. Acid dyes are mainly used for dyeing of wool and silk. However, Acrylic, nylon and spandex can also be dyed with acid dyes with excellent fastness properties.

## **Exercises**

State whether the following statements are True or False. If False, write down the correct one.

- a. Gharcholu is a traditional lehariya textile.
- b. The traditional odhani, Piliya is worn by gujarati women.
- c. Aba is traditional tie-dyed upper garment worn by Muslim women of gujarat.

d. Mothra is an example of a tie-dyed textile with fine resist dots.

e. Lehariya is a tie-dyed textile of rajasthan.

**Fill in the blanks.**

a. \_\_\_\_\_ is a traditional red and black odhani worn by a

Muslim bride from gujarat.

b. \_\_\_\_\_ is a process to produce multi-coloured resist dot

pattern.

c. Tie-dye is a \_\_\_\_\_ dyeing technique.

d. \_\_\_\_\_ is a tiny square shaped resist in bandhej.

e. Lehariya textile has \_\_\_\_\_ lines.

**Exercise**

**Fill in the blanks**

1. ....are used to impart color to the textile materials.

2. ....must have substantively to the fiber during dyeing stage.

3. .... must have solubility in water during dyeing stage.

4. Durability of the....depends upon binders used.

5. Vat dyes are.....organic compounds and not substantive to cellulose.

6 .....are derived from aryl amides organic compounds.

7. .... derived from formulation of Benzedrine salts.

8. .... derived from the formulation of compounds containing sulfur.

**Write important feature of the following dyes**

- Vat dyes
- Azoic/Naphthol dyes
- Direct dyes
- Sulfur dyes
- Disperse dyes
- Basic dyes
- Acid dyes



## Unit - 3

# Textile Printing

### Unit Overview

In this unit students will be informed about different styles and methods of printing designs. The designers should be aware of all style & methods of printing to explore each technique effectively.. Printing advantages and disadvantages will also be discussed to understand printing selection for quality production.

### Objectives of the Unit

- To introduce styles and methods of printed textiles and its effect on design.
- To learn the process involved in printing textiles.
- To gain knowledge of evolution of printing process.
- To understand the origin and history of styles and methods.

### Learning Outcomes

After completing the unit, the students shall be able to –

- Understand the different styles and methods involved in printing Textiles.
- Identify the correct method and style for printing Textiles.
- Recognize the difference between different kinds of prints.
- To get an overview of printing methods.

### Textile Printing

The term 'textile printing' indicates the patterning of cloth by means of printing, dyeing or painting. The printed fabrics are categorized in four different classes or styles: the 'resist' style, the 'dyed' style, the 'discharge' style and the 'direct' style. The resist style and dyed style are the oldest form of decorating textiles. All four styles can be used in conjunction with a great variety of tools and devices to decorate the textile surface. The students of

textile design need to explore and experiment with the styles of printing to develop innovative and decorative surfaces.

The tools and devices used in these styles give ample scope of mixing of the simplest brush techniques to the most elaborate and sophisticated modern screen printing machinery.

Man's urge to decorate his clothing and the fabrics of his environment, by means of printing, dates from the very earliest times, and fabrics so patterned existed before woven or embroidered ones. For, although the earliest examples are from the fifth- to sixth-century Coptic period in Egypt, various records show that printed fabric did exist about 2500 BC. Patterned garments are shown on wall-paintings in Egyptian tombs and Herodotus mentions similar findings in the Caucasus of 2000 BC. Whether the people of China or India were the first to make simple blocks for the printing of cotton cloth is debatable but it seems certain that textile printing was a fairly extensive industry in India.

An early sample of block printed fabric from India was unearthed in Fostat in Egypt. Many similar fragments were found in South East Asia and other early civilizations. It was found that there was a flourishing trade of brightly printed fabrics from India. The British East India Company set foot first on the Coromandal coast and were fascinated by inexpensive, intricately hand printed brightly coloured fabrics. The popularity and subsequent demand of brightly coloured Kalamkari, better known as 'Chintz' in Europe, actually resulted in decline in the demand for machine printed fabrics, produced locally.

The traditional method of printing textiles was by using hand carved wooden blocks. The designs were printed using vegetable dyes to obtain bright terracotta red, indigo blue, turmeric yellow and deep green. The colouring was a tedious process using vegetable dyes. as vegetable dyes do not have affinity for fabric, the cotton fabric is firstly impregnated with metallic salts called mordants. These mordants help in bonding of dyes to the fabrics. The Indian printer's skills were admired the world over to create intricate patterns using indigenous knowledge of mixing and overlapping to achieve varied tones of colours.

## **Introduction to Various methods of Printing:**

### **Hand Block printing:**

Hand Block printing requires equipment in terms of wooden blocks, printing tables, colour trays etc. The blocks are made out of good quality seasoned '*saagwan*'. Block carving is done mainly in Pethapur in Gujarat; agra and Farrukhabad in uttar Pradesh and Delhi. For making a print motif with three colours, four blocks are required; one for the outline and three coordinates for the rest of three colours. The outline block known as '*rekha*' is printed first (Pic. 3.1). It is followed by printing of other filling blocks known as '*gad*'. In case of mud resist printing, mud paste is applied on the fabric with blocks known as '*data*'.

Wooden tables used for block printing are of two types. Tables are padded with layers of felt/ blanket material and covered with fine muslin, which absorbs extra dye. The muslin is changed as and when the fabric is soiled. Traditionally, tables were of low height to enable the printer to sit cross legged on the floor while printing. These tables were narrow width and hence the printer used to keep moving the fabric once the fabric in front of him was printed. at present similar tables are used by printers in some of the remote villages in Rajasthan. The most commonly used tables are the ones with normal height so that the printing is done while standing. The width of the table is approximately 55 inches, as the fabric is laid on the table in full width. The printer moves around the table to complete the printing on both the ends of open width fabric.

The printing trays are square wooden receptacle in which thick layers of absorbent felt material is spread. The printing paste is evenly spread over the felt material. These trays are put on wooden trolleys provided with wheels to facilitate easy movement of printer from one place to another.

Pigment is mixed with gum obtained from the trees such as *babool* or *Arabica*, in order to provide thick consistency to the printing paste.

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## Printing Process

**Desizing:** The fabric to be printed is first of all washed for desizing, to remove starch or any other impurity from it. This will ensure evenly printed fabrics.

**Mordanting:** In case of natural dyes, fabrics are mordanted with metal salts to ensure better absorption and colour fastness.

**Stretching on tables:** The fabric is then stretched on the table with the help of pins, which are inserted diagonally on the edges. This is to avoid the shifting of fabric when printing is taking place.

**Preparation of Colour tray:** The wooden tray with felt fabric layers is placed on the table trolley. The printing paste with pigment of thick flowing consistency is poured over it to spread evenly (Pic.3.2).

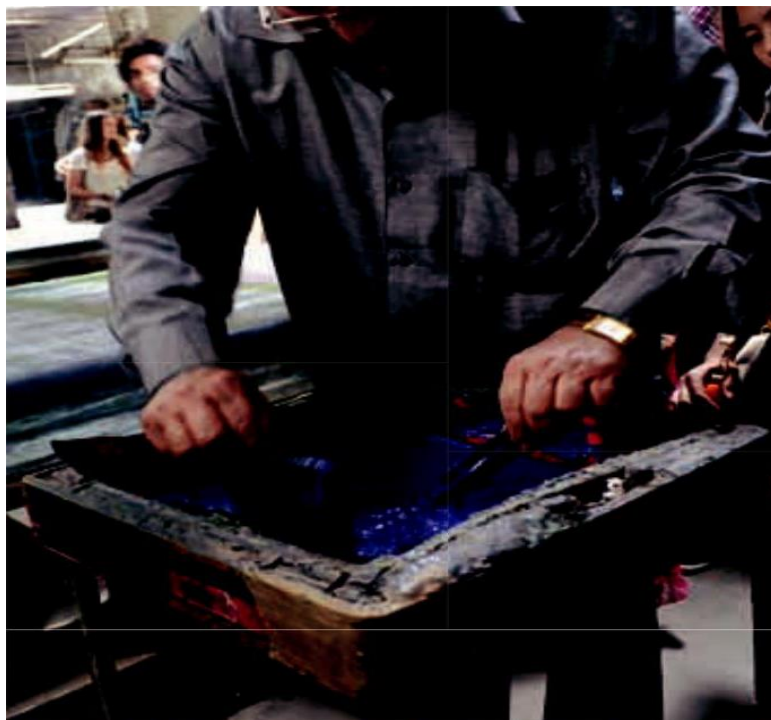
**Printing:** The block for outline 'rekh' is pressed on the colour saturated printing pad and then pressed on the fabric stretched on the table. The block is then carefully lifted to avoid any smudging or staining of fabric. The printing is similarly continued according to the layout. Equal amount of pressure is applied on each block to obtain consistency of colour. Once the first colour printing is finished, second colour is used with fill in blocks and subsequently all blocks are printed.

**Dyeing:** In case of natural dyes, printing is done with mordants and then taken for dyeing.

**Washing:** The fabrics are then washed thoroughly after completely drying in strong sunlight. It is spread for few hours in sun and sprinkled with water frequently to ensure colour fastness.



(Pic. 3.1 Carved out wooden block)



(Pic 3.2 Preparation of colour tray)

**Block Printing:**

Block printing is the oldest form of printing where-in a wooden block with a raised pattern on the surface is dipped into the printing colorant and then pressed down on to fabric to achieve design on the fabric. In Block printing, the pattern is generated by repeating the process of block application on the fabric. For a design of four colours, four separate blocks are developed. Due to manual process, this printing is time consuming and provides flexibility of changing the pattern placement.

**Advantages:**

- Due to simple printing method, this style of printing does not require expensive equipment's.
- Provides flexibility in repeat sizing
- Prints produce have greater decorative value and stamp of craftsmanship

**Disadvantages:**

- Slow production as it involves manual methods

**Block Printing**

## Block Printed textiles of Rajasthan

Rajasthan is known for its colorful block printed fabrics. The arid **Block Printed Textile of Rajasthan** Rajasthan is known for its colourful block printed fabric. The arid dessert land devoid of colourful natural surroundings is compensated by the love and use of bright colours in apparel by both men and women and for their homes too.

Block printing is a style of printing which is labour intensive and versatile. The printer community has been using the same wooden carved out blocks for many generations and are still able to sustain the craft. Two villages known for two different styles of printing are Bagru and Sanganer near Jaipur. Both have similar motifs but the technique of production and the look is very different.

## Bagru prints from Rajasthan

**Region:** Bagru is a small village in Rajasthan, which is known for its mud-resist block prints.

**Technique:** In Bagru, the printer first processes the raw material which is mainly cotton. Other natural fabrics are silk, cotton and silk blends etc. The fabric is then printed with mordants in paste form. The printing is done by using outline and filling blocks. The prints are then covered with a resisting paste 'dabu' made of clay and gum. It is then dried and dyed in vegetable dye. The mud resist paste is used to resist the penetration of dyes, mainly vegetable dyes on cotton fabric as per the design. After dyeing the fabric is thoroughly washed at the river. The mud resist paste is washed off exposing printed motifs on white background surrounded by the base colour. Hence, the resulting effect of dark and deep background with light coloured prints is achieved by resisting and mordanting.

**Motifs:** The motifs are inspired by the 17th century Persian motifs and are classified into the following five categories:

- Single motifs like flowers, leaves and buds. Some examples are *suraj ka phool*, *chakri*, *anguthi*, *gende ka phool*.
- Entwined tendrils that include all over *jaal* of leaves, flowers and buds.
- Trellis patterns include *jaalis* from the Mughul period.
- Figurative designs that include animal and human figures such as elephant, deer, lion, peacock, dancing women, warrior men etc.

- Geometric designs include waves (*lehariya*), chess (*chaupad*), Fortress wall projections (*kangura*), lines (*dhariya*), dots (*bindi*) etc. (Pic. 3.3)





Pic. 3.3: geometric design on block printed fabri

**End use:** The brightly coloured block printed fabrics from Bagru are used for apparel as well as home furnishings such as quilts, bedspreads, cushions and curtains.

### **Hand Screen-Printing**

This is the best method for printing of low yardage, samples of exclusive limited quality of designs. Screens are generally made of polyester fabric. Sometimes this fabric is also called bolting Cloth, because fabric is tightened on a light weight metal frame. In this type of printing large repeat sizes are possible (up to 120”).

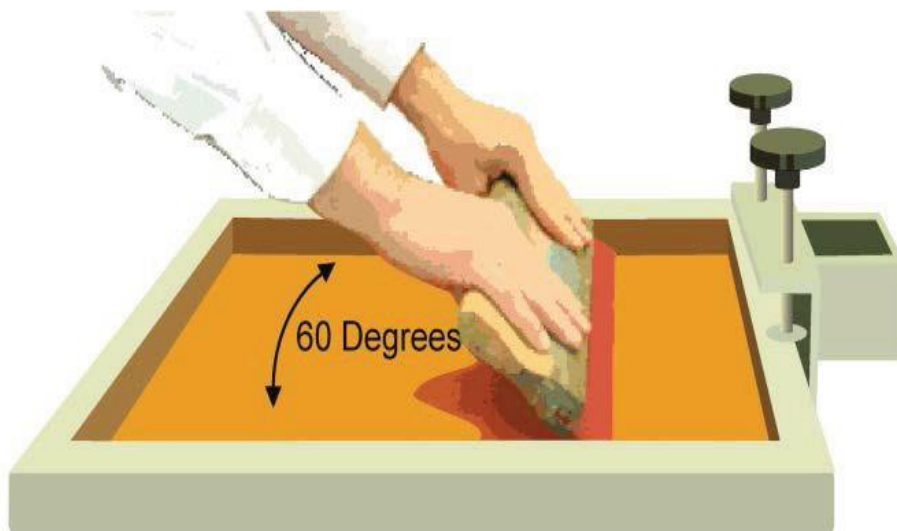
### **Advantage of Hand Screen Printing**

- Wet-on dry prints effect possible.
- Better penetration of color than roller prints due to heavier lay-on of color.
- Acceptable to all woven & knitted fabrics.
- Rapid preparation of screens and rapid pattern changes over possible.
- Ability to print cut garment parts and small items (towels, scarves etc.)

### **Limitations of Hand Screen Printing**

- Half tone designs are not possible
- Fine-line paisley prints are not possible

- Lengthwise stripe designs cannot be printed
- Slow production
- Uneconomical for large scale production of yardage.



## **Roller Printing**

This is method (can be called a machine counterpart of block printing,) engraved copper cylinders or rollers are used in place of hand carved blocks. The required designs are engraved on the surface of copper roller, to which dye is applied and excess colour is scraped off the roller's surface, leaving dye in the engraved sections. When rollers come in contact with a fabric, the dye on the roller gets transferred to the fabric surface.

### **Advantages:**

- Large quantity of fabric can be produced using this method of printing
- Due to precision achieved in aligning the roller, repeats marks are not visible and hence clear designs are achieved.
- Due to engraving, sharp outlines can be obtained which is extremely difficult to achieve in Block printing.

### **Disadvantages**

- Not economical for short run of Fabric
- Repeat of the design is limited to circumference of the roller and width of the roller.
- Setup cost of roller, engraving and printing machine is high.

## **Heat Transfer printing**

In this indirect style of printing, dyes are transferred from paper to a thermoplastic fabric under controlled conditions of temperature, time and pressure. The image is first engraved on a copper plate and then pigment is applied on these plates. The image is then transferred to a piece of paper. The paper is then placed on the fabric and heat pressure is applied to fix the image on the fabric.

### **Advantages**

- Simple operation
- No after treatment of fabric required
- Excellent print quality

- Excellent design possibility

### **Disadvantages**

- High cost of printed paper
- Not economical for small orders



Heat Transfer Printing

## **Styles of Printing**

These are specific features in the prints, which provide the unique identity to the prints. Such types of effects are not possible by any other methods of the prints. Such as the merging effects of two or more colours are only possible in the Tie and Dye styles or the cracking effect within the colour are only possible in the Batik style of printing.

### **Direct Prints**

This print is also called an application print and it is most popular types of print style. In this print design is printed directly onto a white cloth or over a previously dyed pale coloured fabric. In this print, the printed portion is considerably darker than the dyed backgrounds.

### **Identification of Direct Prints**

The background is generally white, or has larger portions of white background.

The printed design is lighter in shade on back of the fabric than on the face. This may not be evident on lightweight fabrics because of the strike-through of the print paste.

### **Discharge Prints**

In this type of prints, Fabrics are generally dyed in a solid color, prior to printing; the design is applied by screen or roller with a chemical (sodium sulfoxylate formaldehyde, a reducing agent). This reducing agent will destroy the color in the printed portion and white background will appear in the printed area.



**Pic: Discharge Prints on Red Background**

For example, "White discharge print" White polka dot on a blue background can be made by first dyeing the fabric blue, then printing appropriate dots with the chemical which removes the blue color.

The colour-destroying chemical does not affect on vat dyes so that "Color discharge Print" can also be produced. For color discharge, these two substances (the color removing chemical and vat dye) may be mixed together in the same print paste and applied in the similar fashion.

When printing with this mixture, the color-

A yellow polka dot on a blue background can be made by first dyeing the fabric "Blue" then printing with a yellow vat dye mixed with the colour-removing chemical.

Discharge print can be made by roller & screen methods, but not by heat transfer printing.

Discharge Prints are not widely used due to following reasons:

- Production is more costly than direct print because fabric is to be dyed prior to printing.



- Very careful and precise process control is required.

Developments of automatic rotary screen-printing, high quality blotch prints, which can produce the same effect at lower cost.

### Identification of Discharge prints

The background is the same shade on the face and back of the fabric (piece dyed)

- Print design area is white or a different removing or shade than background.
- Back of the print design reveals traces of the background removing.



**Discharge Printed Fabric**

### Resist Prints

In this type of prints, the fabric is printed in two steps. In first step, pattern or design is printed on a white fabric with a chemical (wax-like

Resinous substance) that will prevent or resist the penetration of dyes. In second step, the fabric is dyed by piece dyeing method.



Resist prints are not popular type of printing on fabric. It is generally used where removing of background colour from the fabric is very difficult. It is performed as craft or hand printing rather than on production basis. Generally used for Batik prints, tie-dye prints and ikat prints.



***Pic. Resist Printed Fabric***

### **Blotch Prints**

In this type of printing, complete background has been obtained by printing. It is also called Direct Print. The print and pattern design color are printed on fabric in one printing operation that imitates the discharge or resist style of print effects.

#### **Identification of Blotch Prints**

- The blotch print background color is lighter on backside of the fabric.
- Possibilities of large background color areas of the print are not covered with full depth of colors.
- Precise control is necessary.
- If pigment are used in blotch prints, then fabrics very often result in objectionable stiff hand.

### **Duplex Prints**

In this style of prints, Fabrics is printed on both the sides. This generally provides imitate Jacquard & Dobby woven pattern to the fabrics. It is very expensive printing.



Duplex printing

## Warp Prints

Warp Prints involve printing the warp yarns of a fabric before it is placed on the loom for weaving, then, the fabric is woven with a solid color weft usually white or contrast color.

The result is a soft, shadowy design on the fabric. Producing warp prints require careful and skilled labor. These prints are found almost exclusively on high quantity and expensive fabrics.



Warp Printing (Patola Saree)

## Exercise

Fill in the blanks

1. ....is used to apply coloring localized area only.
2. .... Is also called an application print & most popular print types.
- 3 ..... fabrics are dyed in solid color prior to printing & the design is applied by screen or roller with a chemical.
4. In..... production is more costly than direct print because fabric is to be dyed prior to printing.
5. The background removing is the same shade on the face and back of the fabric in.....
6. In..... the area will be slightly stiffer and a bit thicker than the non-print area.
7. The..... background color is lighter on backside of the fabric.
8. Printing with chemical substance that will destroy the fiber in the printed area is called....
9. Prints in which both sides of the fabric have been printed are called.....

### Short answer questions

- ‡ 1. Write down the limitation of the Screen Printing.
- ‡ 2. Write the Specific features of the Screen printing.
- ‡ 3 What are the specific features of Direct prints?
- ‡ 4. How do you identify direct print on the given fabric?
- ‡ 5. What are the specific features of Resist prints?
- ‡ 6 How do you identify Resist print on the given fabric?
- ‡ 7. How do you identify the Blotch print on the given fabric?
- ‡ 8 Write down the Specific features of the Following Prints
  - a) Duplex prints

## **Exercise**

### **Fill in the Blanks:**

1. The term \_\_\_\_\_ indicates the patterning of cloth by means of printing, dyeing or painting.
2. \_\_\_\_\_ Printing is the oldest form of printing.
- 3.

### **Describe the following**

- Block printing.
- Roller printing.

# **UNIT 4**

## **Introduction to Print Design and Design Techniques**

### **Unit Overview**

This unit will introduce basic ingredients for print design development to enable students to develop new and effective designs using relevant reference materials. Further, they will also learn to ideate design, select colors, set repeats and plan layouts to enhance prints.

### **Objectives of the Course**

- Understanding Textile Design, repeat and layout.
- To develop an understanding for surface design development.
- To sensitize students towards various types of Prints.
- To understand forms, shape and color combinations for various categories.
- To sensitize students towards specific influencing forms, objects and shapes.
- To develop an ability to recognize the design in each type of print.

### **Learning Outcome**

- Identify the pattern, repeat and layout.
- After completing the unit, the students shall be able to.
- Understand forms and color combinations.
- Develop an understanding for various categories of prints.
- Identify the types of prints.

### **History of Print and Printed Textiles**

The impact of Fashion can be observed in textile usage of any period, irrespective of wealth, class and different sections of the society. When we look at old prints, we notice that at every level of the society, prints provide a

commentary on the interplay of Fashion, technology and social change. From older days, textiles provided the means by which ever large sections of the community could participate in these rituals of decorating, when other things were expected to last a generation or more, renewed textiles kept abreast of Fashion.

A designer's job is to combine skills, taste and imagination to produce good designs. This book will guide students for idea generation for printing on the cloth. A textile design begins with an idea on paper and ends on printed cloth. All around the world billions of mtrs. of fabric is being produced by number of Print Houses. Each print house requires regular supply of new designs and it is extremely difficult to judge the number of designs that are used in their production.

Since 1980, computer revolution has also affected the professional practices of textile design industry and there has been number of innovative developments in the printing process. However, the three skills required by the designer – idea generation and conceptualization is still being done in a traditional manner. With the advent of newer technology, the designs development is being done by various advanced methods.

Fashion, styles and therefore textile pattern change from season to season, year after year. Students of textile design should have keen interest in world art and cultures that is easily accessible now a day. Understanding regional art and culture gives deeper insight of Regional Textile design development.

In order to work in the field of Textile design, students must know the historical development to gain sensitivity towards its development. Following points show a brief overview of historical developments in printed textiles.

- During 5000 B.C., Egypt, Flax was used by the early Egyptian cultures along the Nile to make linen like fabrics.
- During 3000 B.C. in India and in Peru, Cotton was produced simultaneously in these two almost disconnected parts of the prehistoric world.



- During 2640 B.C. in China, Silk was first cultivated and woven. By 1400 B.C. silk production in China was at its peak.
- During 2000 B.C. in Peru, Clay cylinders were used to print border patterns.
- During 1500 B.C. in Mexico; Peru, Tie-dyeing, batik (a wax resist technique), and block and small roller printing were developed; a finish for glazing of cotton fabrics was also perfected during this period.
- During 450 B.C. in Greece, Animal figures were painted on clothing using pigment dyes.
- During 500-600 in Persia, Patterned cloth was printed in red, black, and powdered gold.
- During 1100 in Europe, Fabric printing was done at various levels simultaneously in several countries.
- During 1300-1600 in Europe, The era of great weaving, which includes tapestry, damask, and silk embroidery, was at its peak. Fabric printing declined during this period.
- During 1676-1771 in Europe, Cloth printing works started in England, Holland, Germany, Switzerland, France, Ireland, and Scotland. The factory at Jouy, France, founded by Oberkampf in 1759, where the famous Toile de Jouy fabrics are designed and printed were among the best printing setup.
- In seventeenth century Europe, the design and manufacture of woven or embroidered designs had achieved high level of quality and prints were often made as cheap version.
- European companies started trading with Asian countries including hand painted designs from India known as "Calicos" or "Chintz". The imagery on these fabrics often in the form of "palampores" was popular and due to its increased demand, traders have encouraged manufactures to produce these in large volumes.
- During 1712 - In U.S., George Leason established the "Calico Printing Works" in Boston. During the next 150 years, more than seventy print works were established throughout New England and the Mid-Atlantic States.
- During 1785 in England, Industrialized roller printing was developed. During 1900 in England, William Morris design were popular for printed fabrics and wallpaper in the Art nouveau Style, which were greatly admired and were influential in the U.S. Today, William Morris considered the forerunner of modern design in textiles.

- During 1900, screen printing was introduced as a new technique to reduce cost implication of copper roller printing.
- In 1929, France, the age of synthetic chemical fibers began with the introduction of rayon, the so-called silk substitute. Although its development began in 1884, it was finally perfected in 1929.
- It has been said that Indian subcontinent is the most original, creative and prolific source of patterned textile production in the world.
- Twenty-first centuries: Digital revolution was considered far more significant than the invention of writing or printing. Digital technique provided exciting new possibilities for development of print design.

## **4.1 VARIOUS ASPECTS OF DESIGN**

The print design business is complex & demanding and the designer has to regularly look out for references to “ideate” and “be inspired”. This is a fundamental skill to start your journey of designing involving an in-depth study for innovative and creative design development.

Designing trend in style, colours, themes, techniques change constantly. In order to keep up with these changes, one must be aware of various reference materials. Every design student should record relevant information for present and future use. Research provides creative investigation which leads to ideation and inspiration. This process keeps up with the changing trends to provide creative food for design development.

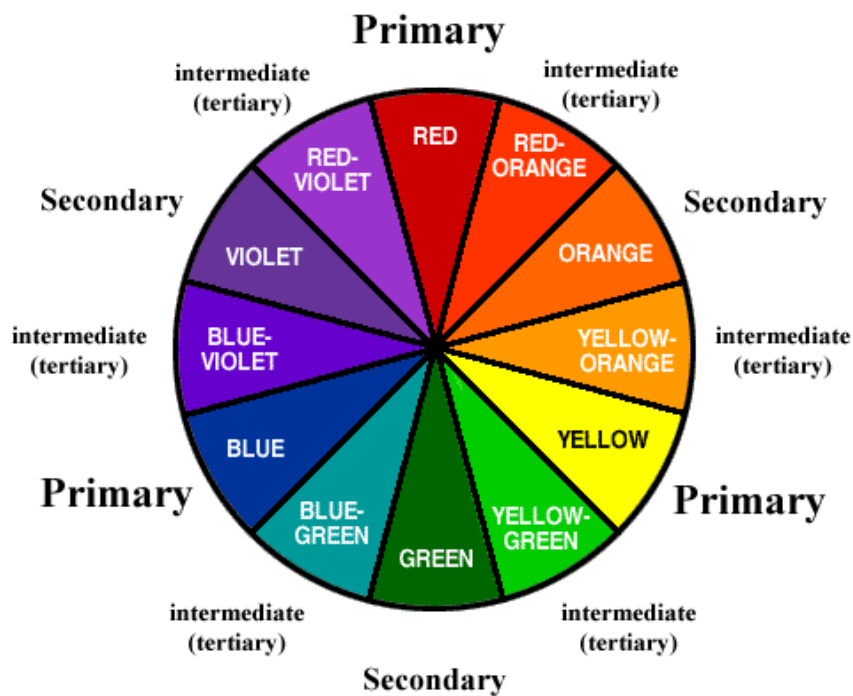
Each designer uses one's own understanding of reference material. These individual ideas to create unique designs make each designer different from the others. With the advent of internet, research is not limited to regional journals and books. One can research specific information, using this medium. Though this tool is available with us, however, each student should learn the ethical methods of using this resource.

Students can regularly update their knowledge by reading Newspapers, Magazines, Books, visiting Museum, Gallery, Exhibitions, Websites and collecting regional fabric swatches.

### Color wheel

A **color wheel** or **color circle** is an abstract illustrative organization of **color hues** around a circle, which shows the relationships between **primary colors**, **secondary colors**, **tertiary colors** etc.

Color wheels are based on three primary colors, three secondary colors, and the six intermediates formed by mixing a primary with a secondary, known as tertiary colors, for a total of 12 main divisions.



### Layout and Repeats

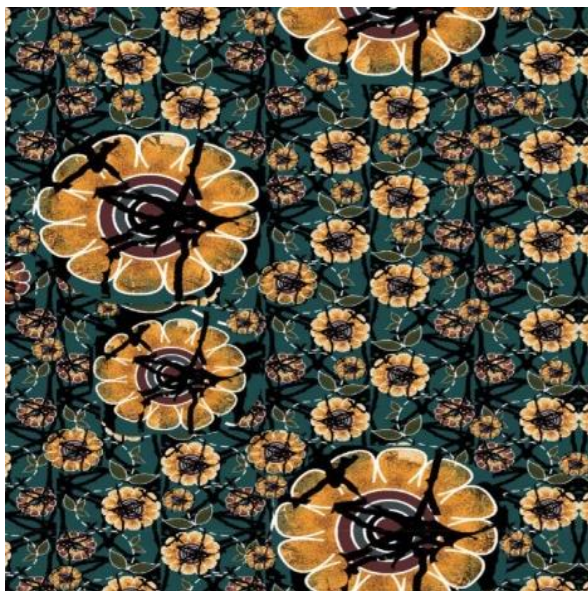
Designing a textile requires knowledge of layout, color, tracing and painting techniques as well as correct use of art material, supplies and reference material.

Following fundamental methods should be adopted for successful development of print designs:

**Design:** Designing can be defined as relating and visually arranging components or elements to create effects. Space, Line, Shape, Form, Colour, Value and Texture are the design elements with which artists and designers work to create a design. Students should gather related reference material for idea and inspiration to start designing prints. On achieving the idea, students can sketch on the paper to finalize the design.

### **Layout (Laying out of Design):**

Layout is the process of planning the repeats to create continuous flow in all directions. Students should select the layout depending on the design requirement, e.g. for home furnishings, a large repeat size needs to be planned for an effective layout. Through experience, students can learn to put designs in interesting layouts to convert a good idea into a good design. The design can be put in All-over, Tossed, Free Flowing, Stripes, Border, Set, Scenic and Patchwork layouts.



**All over layout**



**Border layout**



**All over layout**



**Patch work layout**



## Repeat

The unique characteristic of designing textiles is that, unlike other commercial art forms, a design must be prepared to be printed over and over again in a continuous flow, without apparent break/interruption in the pattern. These days, with a use of computer software, setting repeats has become easy and fast.

The repeats are planned/selected to accommodate selected printing process. Repeats of block printing would vary in sizes in comparison to Roller screen printing. The vertical repeat or the repeat's length, must fit into the size of the screen to achieve desired results.

Half drop, Mirror, Brick, Border, Stripe and Square are some of the popular repeats. These styles can be merged together to achieve interesting patterning.



Ms. Nikita Malik, All over repeat pattern Textile design, New Delhi



Colour palette

**Colour:** in achieving desired results, color selection plays an important role in improving the overall appearance of the design as its usage makes or breaks a design.

In textile industry “Colorist” is employed to provide colour directions and further color-ways for the textile pattern as right color combination greatly influence design success.

Students can paint color charts to develop color selection sensibility.

### **Exercise**

1. Layout is the process of planning the repeats to create continuous flow in all directions.
2. In textile industry\_\_\_\_\_ is employed to provide colour directions.

### **Short answer questions**

1. Describe basic requirement for textile design development?
2. Describe the role of repeat setting in design development?
3. Describe the role of layout setting in design development?



## **4.2. Print Categories:**

### **4.2.1 Introduction to various types of Design and their categories:-**

A design for printed textiles often begins with a drawing or a pencil sketch. The design often gets its inspiration from a theme. There are many categories of printed textiles. These categories are based on the certain look each print creates on historic and cultural references and on themes originating from fashion trends. The trends for these designs are developed from many sources. For example, when the ecology movement gained prominence in the 1970s, scenic or landscape patterns, illustrated with sky, birds, water, and trees, became popular. Whether the designer's inspiration is a social movement, Art movement or natural surroundings, the world of design is constantly changing and responding to outside influences.

The designer should always be well informed about art, politics and other current events. A designer usually receives the design concepts and reference material from design directors. It is the responsibility of a designer to interpret the concept with the help of reference material into a pattern that is both saleable and aesthetically pleasing.

### **4.2.2 Geometric Prints**

A geometric print comprises of designs made with circles, squares, triangles, spirals and stars. They are visually stimulating. Geometric motifs can be either evenly or randomly scattered on the print. They can be placed in a chequered pattern, in stripes, in spiral, in concentric circles; one inside the other, many small shapes can combine to form bigger shapes forming narrative patterns, etc. These designs can vary in colour from monotone to bold and bright hues, can be spaced at varied distances, can be intricate or simplified, can be expressive and symbolic, and can range from small to large. Colours range from monotone to bright and bold. Geometric prints worldwide can be used in all kinds of clothing for men, women and children like blouses, jeggings, skirts, saris, shirts, trousers, kurtas, pyjamas, night wear, shorts, swim wear and accessories like bags, ties, scarves, dupattas, and shoes. These prints are also used in home products like table covers, cushion covers, bed sheets, curtains, towels, napkins, upholstery, etc.



Geometric print

### 4.2.3 Floral Prints

Floral prints are patterned in rich colors with delicate flowers and leaves. It includes gatherings of a flower garden and also grasses and grains. It excludes agricultural products like fruits, vegetables, nuts, pinecones and trees. Flowers with dragon flies, butterflies or lady birds, grasshoppers or insects fall under this category.



**Floral prints**

Floral printed fabrics have been in fashion for hundreds of years which help in ornamenting us. Many designers like Sabhyasachi Mukherjee or Laura Ashley use a lot of floral designs in their collections. Flowers have been symbolic of femininity, and delicacy hence is popular in women's clothing. The floral print originates from the east and Asia. Over time European manufacturers began to copy these fabrics to suit European tastes. Often we find certain flowers are specific to a region. For example prints with roses are popular in English textiles, cherry and apple blossom are native of Japanese textiles, Peony flowers being specific to china, and the famous buteh design (floral cluster or bouquet of flowers) of India and Persia. Floral prints are very popular for women's clothing or accessories. The layouts of the floral prints are found in striped format, scattered, bunches and bouquets. These are also used in home furnishings. (Fig 2.7.1, 2.7.2)

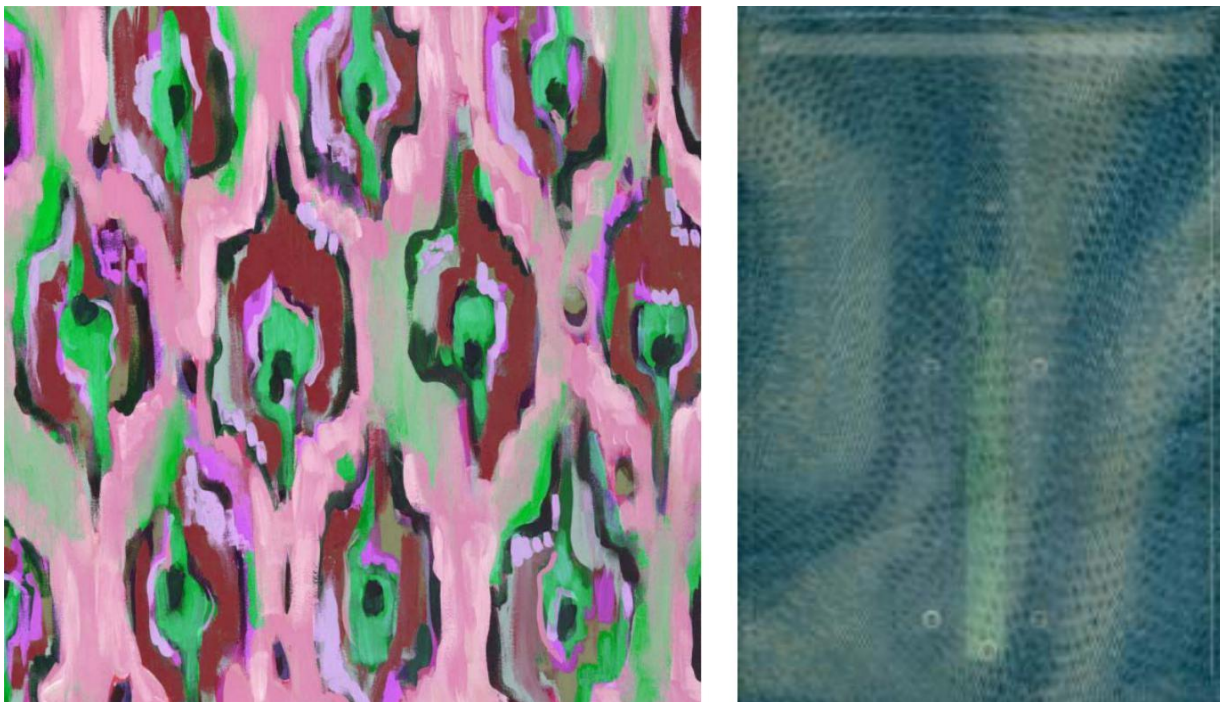


**Floral print**



#### 4.2.4 Animal Prints

Animal prints on textiles resemble the pattern on the skin or the fur of an animal such as a leopard, cheetah, zebra, tiger, spotted hyena, striped hyena, African wild dog, giraffe or monkey. Animal Prints date from the early nineteenth century, when Napoleon brought back real hides collected on his expedition to North Africa. In the twentieth century, animal skins began to appear on clothing almost exclusively in fashion for women. They are also used for accessories like handbags, bets, jewelry and footwear. The two most common kinds- big cats and snakes – have become perennial favorites in the fashion world. Animal prints have long been a popular style for many reasons. They are generally expensive and hence they are a symbol of wealth and status. The look is primal, wild, eye catchy, and savage. Many recently, with the increasing awareness of ecology and animal rights, view the wearers of real fur as barbaric, but the fake has become fashionable. A major difference between animal prints and fur clothing is that animal prints today very often use fake fur instead of animal coat. Animal print applications extend beyond clothing and art prints and are commonly used for other decorations, including rugs, wallpaper, or painted surfaces. The colors used in these prints are those found on the animal's body which generally are shades of brown, black and white. (Fig. 2.10.1, 2.10.2, 2.10.3)



Animal prints



**Animal Print**



## Folkloric Prints and Ethnic Prints.

Folkloric is a term for the folk designs inspired by traditional popular motifs associated with specific cultures. These motifs include forms of plants, flowers, birds, animals, human figures, scenic subjects, and geometric patterns, stylized according to the specific culture. Traditional techniques specific to some cultures are block printing, stenciling, batik, tie and dye etc. The layouts can be all over, in huge to tiny repeats, stripes, borders, and checks. Colours range from bright and brilliant, to dark or earthy shades. Some of the well-known folkloric prints available in the market are Chinese, Native American, Japanese, Russian, Egyptian, Mexican, Indonesian, Persian, and Indian. Warli prints come under this category. (Fig. 2.12.1, 2.12.2, 2.12.3)



Folkloric print



Ethnic print



Ethnic print

### 4.2.6 Dot Prints

Dots have always been in trend. Polka dot prints were the most popular element in 1960's. Dots can be various sizes. Just a point or a big circle both are referred to as a dot. These can be simply printed on two the fabric with a different background color, or different coloured dots. On a solid background or many dots can make different design and patterns. There are many Permutations and combinations possible.



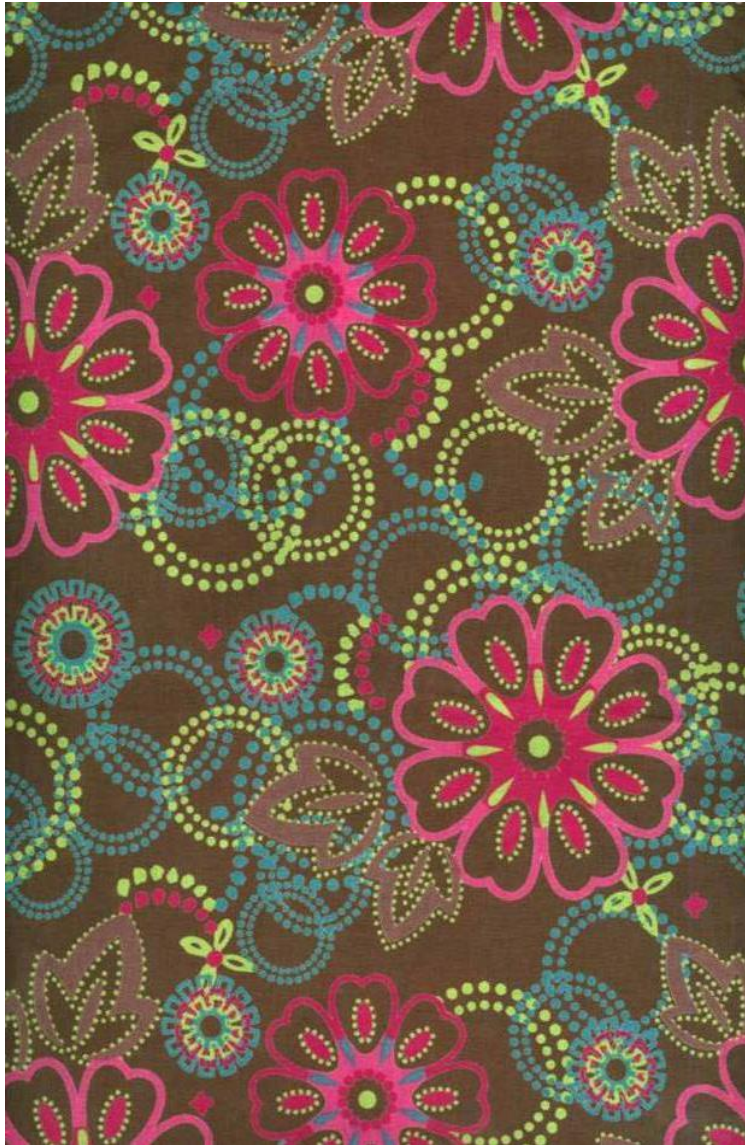
Dots are very versatile and can be printed on almost everything. Thus, in homes-dot prints are found on wall papers, bed linens, cushion covers, curtains etc. In clothing for men, dots can be used in various garments like men's shirts, boxers etc. For women's wear dots can be seen on suits, blouses, saris, wrap-around, shirts, palazzos, shorts, leggings, jeggings etc. In various accessories also dots are used for ties, scarves, stoles, footwear etc.

#### Dot prints



#### Dot prints





### 4.3: Print Design Techniques

In the earlier unit you learnt about the different categories of prints. In this unit you will learn about the different techniques to develop innovative, unique and interesting prints. Different techniques render different results in terms of look, feel, mood and texture. Techniques accommodate to the changing fashion trends and create new looks. Special effects to a design can be given to create a new appearance or to enhance an existing design. Some of these techniques are Wax Resist Technique, Fevicol Resist Technique, Bleach Technique, Rubber Solution Technique, Salt and Sugar Technique, Bubble Effect Technique, Etching

Technique, and Intercutting Technique. These techniques bring originality, add texture and give a three dimensional look to the print design being developed.

### **4.3.1 Etching Technique**

The etching technique consists of layering two or more colors over each other and then etching out a design from the top layer with a blade/ scraper to bring out color of the lower layer. For creating an effective design it is better to apply a lighter color on the lower layer and a darker one over it. Darker the upper layer, clearer will be the colors of the etched area. (Fig. 3.7.1, 3.7.2, 3.7.3, 3.7.4)

#### **Materials Required:**

1. Drawing/ cartridge sheet
2. Poster colours
  1. Paintbrush
  2. Oil pastels/ wax color
  3. Blade

#### **Step**

1. Take a Drawing/ Cartridge sheet.
2. Color the entire sheet with bright shades of wax crayon in random patches.
3. Use a darker color wax crayon/ poster paint as the top layer of color over the previous layer.
4. If poster paint is used, let it dry completely.
5. With the help of a blade or any sharp object, carve an interesting pattern, scraping off the upper layer.
6. Dust off the scraped colour from the surface of the sheet.

#### **Precautions:**

1. While coloring the first layer make sure no white spaces are left.
2. For the second layer, make sure the previous lower layer is not visible.
3. While using poster colour use thick paint and minimum amount of water.
4. While using a blade or sharp object, do not use too much pressure or you may tear the paper.

#### **Result:**

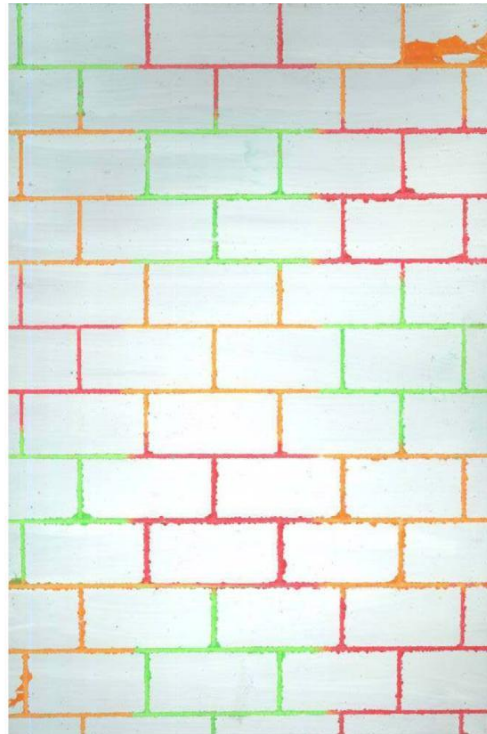
The designs develop an interesting tone on tone, merged effect often having a three dimensional look to it.

Some Print Designs using Etching Technique:

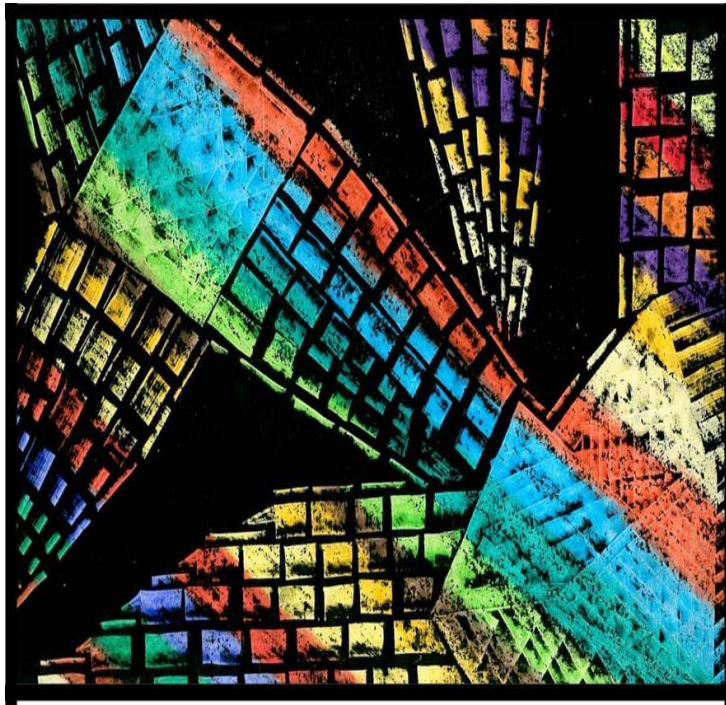




**Textile Desig Fig. Utkarsh Anand**  
(Textile Design: 2011-2015)



**Aashima Vaid**  
(Textile Design: 2011-2015)



**Fig. Kuhu Shrivastav (Textile Design: 2011-2015)**



**Fig. Gausul Qamar Khan (Textile Design: 2011- 2015)**

### **4.3.2 Stamping and Sponge Technique**

The stamping block or sponge acts as a medium of leaving an impression on a surface when it is dipped in colour and stamped. The block could be made up of any material for example cross section of a lady finger, sponge cut into different shapes, dry leaves etc. Block printing is also an example of stamping technique. (Fig. 3.9.1, 3.9.2, 3.9.3, 3.9.4)

#### **Materials Required:**

1. Drawing/ Cartridge sheet
2. Photo Ink/ Water colors/ Bleach
3. Paintbrush
4. Water container
5. Color palette/ Mixing bowl
6. Stamping block/ Sponge



**Steps:**

1. Take a drawing paper
2. Dip the stencil block in paint/ photo ink/ bleach.
3. Stamp it over the drawing paper.
4. Use different stamping blocks to create different designs.

**Precautions:**

1. Do not mix too much water in paints or the colour will not stamp well.
2. Stamp using pressure of hand.

**Results:**

The print is composed of the design of the stamps used

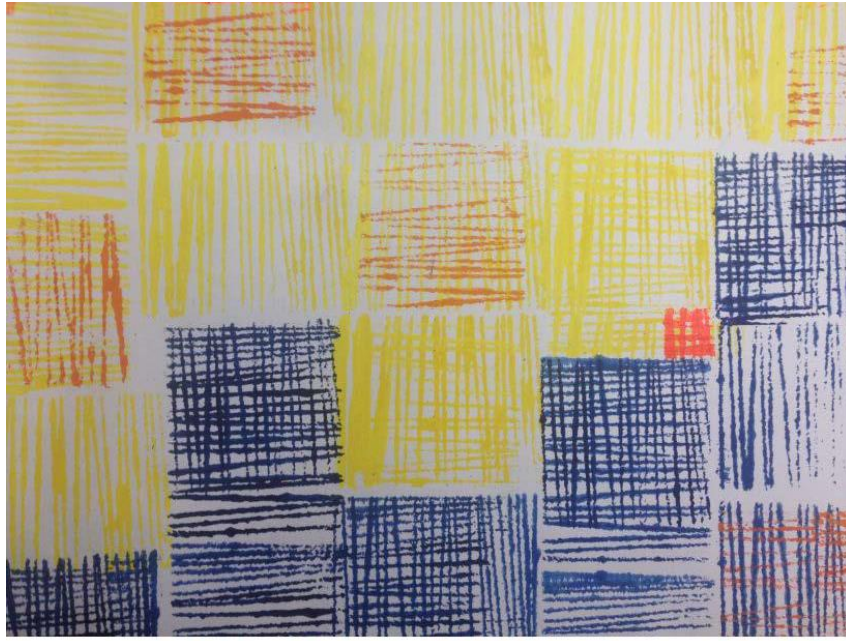


Anupriya Mridha(Textile Design: 2011-2015)





**Gausal Qamar Khan(Textile Design: 2011-2015)**



**Prashneet Oberoi (Textile Design:2011-2019)**



**Anupriya Mridha (Textile Design:2011-2019)**

### 4.3.3 Dry Brush Technique and Stencil Technique

Different textured surface or sheets can be used for the dry brush technique. The dry brush effect adds a three dimensional feel to the print. An interesting stencil can be made, kept over a sheet of paper and a dry brush can be brushed cover the stencil creating interesting shapes with textures. (Fig. 3.10.1, 3.10.2, 3.10.3, 3.10.4)

#### **Material required:**

1. Drawing/ Cartridge sheets (Different textures)
2. Acrylic colors/ poster paints mixed with fevicol
3. Paintbrush Different sizes)
4. Water container
5. Colour palette/ Mixing bowl

#### **Steps:**

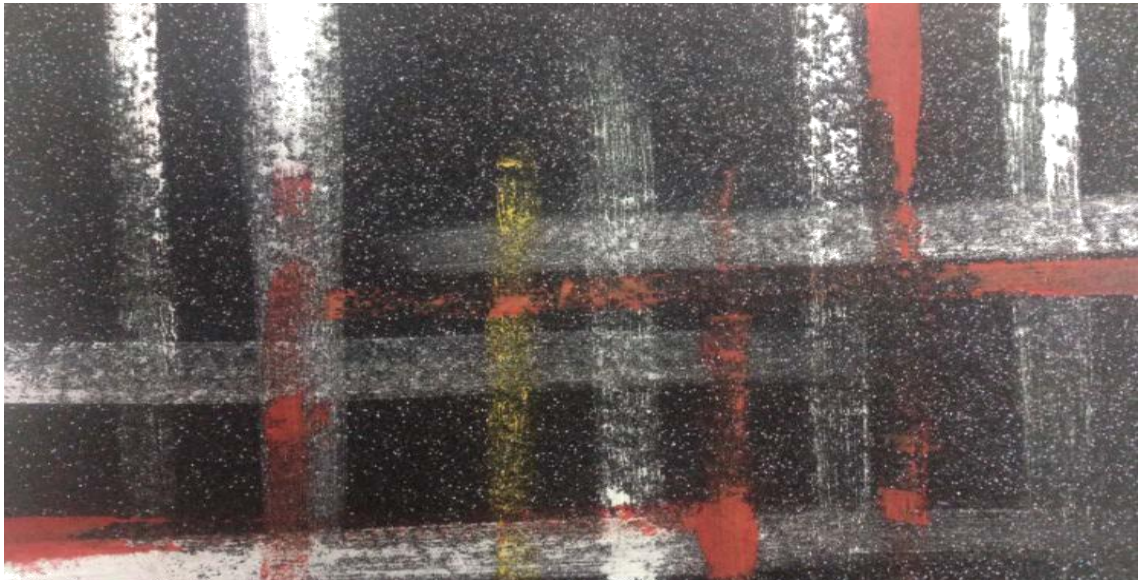
1. Take a drawing sheet.
2. Put the dry paint brush in acrylic paints.
3. Make any design of your choice on the sheet
4. Use different colour and sizes of brush for making of different designs

#### **Precautions:**

1. Wash the brush properly before dipping and using another colour
2. Dry the brush before putting it in acrylic colors.

#### **Results;**

Different textured sheet after application of dry brush will look little more embossed and the entire design gets a three dimension feel.



**Prashneet Oberio(Textile Design 2011-15)**

### **4.3.4 Collage Technique**

It is the technique of creating collage kind of prints. It is a fast and convenient method of creating prints. It is created by cut outs of various prints in different shapes and patterns and then put all together in a same piece of paper interestingly.

#### **Materials Required:**

1. Drawing/ cartridge sheet
2. Photo ink/water colour/oil pastels
3. Paint brush
4. Water container
5. Scissors
6. Fevicol/ glue
7. Colour palette
8. Mixing bowl
9. Bleach

#### **Steps:**

1. Take drawing/ cartridge sheet
2. Create different types of textures as many as you can using photo ink, water colour etc.
3. Cut out the printed textures according to your theme or with different shapes and patterns.
4. Paste the cut out textures creatively in separate sheet.
5. It will create collage of different prints.

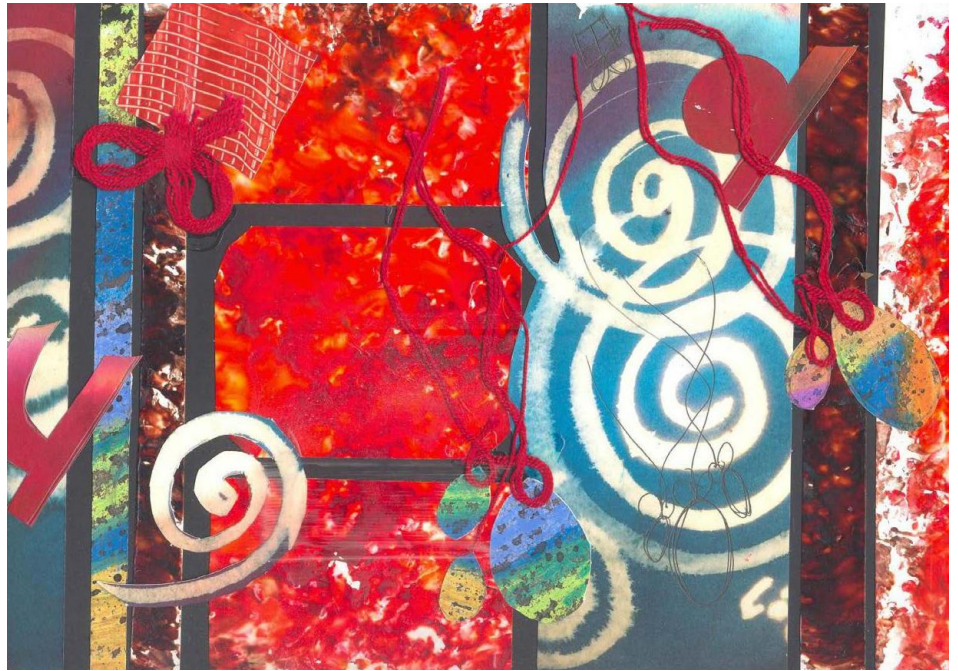
#### **Precautions:**

Let the printed sheet dry completely before the cut out.

#### **Result:**

1. This technique helps in creating beautiful collages.
2. It gives the 3D effect to the print by the emergence of different print in a same piece of paper.





**Abhishek Gupta (Textile Design: 2011-2015)**

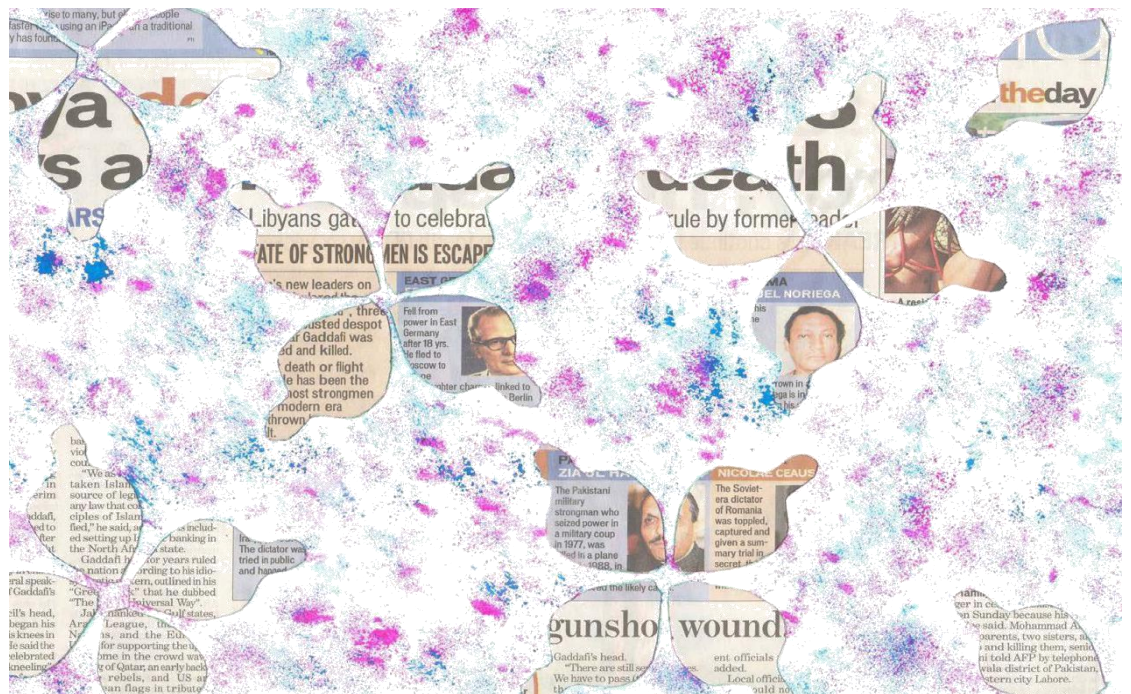


**Fig. Abhishek Gupta (Textile Design:2011-2015)**





Abhishek Gupta (Textile Design:2011-20)



Abhishek Gupta (Textile Design: 2011-2015)

## Exercise

### Fill in the blanks

1. \_\_\_\_\_ is the process of applying color to fabric in definite patterns or designs.
2. A \_\_\_\_\_ print comprises of designs with regular shapes like circle, square, triangle, octagons, pentagons and other polygons.
3. Polka dots come under the category of \_\_\_\_\_ prints.
4. The layouts of the floral prints are found in \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
5. Shades of \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_ are typical to nautical print.

### Match the Following

- |                 |               |
|-----------------|---------------|
|                 | Animal prints |
| • Floral        |               |
| • Zebra Stripes | Laura Ashley  |

## Exercise

### Fill in the blanks

- a. Techniques accommodate to the changing \_\_\_\_\_ trends and create new looks.
- b. The etching technique consists of \_\_\_\_\_ two or more colors over each other and then etching out a design from the top layer to bring out colour of the lower layer.

### Answer the following questions

- a) Why are print design techniques important for creating a textile print?

### Match the following columns

- |         |          |
|---------|----------|
| Etching | Engraved |
|---------|----------|

# UNIT - 5

## EMBROIDERED TEXTILES

### Objectives

- To introduce the technique of embroidery for value-addition.
- To create awareness about the different embroidered textiles of India.
- To initiate identification of regional embroideries developed by various communities.
- To understand the origin of technique and design with reference to colors, motifs, layouts of different embroidered textiles.

### Learning Outcomes

***After completing the unit, the students shall be able to –***

- .Classify the regional embroideries of India.
- Identify a specific embroidery style of India on the basis of colors, motifs and layout.
- Identify the influencing factors for development and evolution of a specific embroidered textile.

### 5.1. Introduction to traditional embroidery textiles from different region of India.

Embroidery or the art of needlework resulted from the passion of womenfolk to express their creativity and ornament their apparel and household textiles. Primarily a feminine art, young girls learned the craft from their mothers and older women in the family. The artistic expressions of the embroiderer are skillfully created on fabric with a simple tool, needle or a hook needle known as awl or tambour.

The art of embroidery dates back to as early as the Indus Valley civilization. Bronze and copper awls excavated in Harappa confirm that embroidery was a practiced craft in ancient times. Though none of the embroidered samples exist from primitive times, travelogues of foreign visitors to India mention about prevalence of ornamented textiles in Indian kingdoms. Megasthenes, a Greek traveler during the Mauryan period in 4<sup>th</sup> century BC has referred to

elaborate gold patterning on robes of royalty, possibly using embroidery as a technique for fabric decoration. Another traveler from the 13<sup>th</sup> century, Marco Polo has described the intricate embroidered textiles from eastern and Western India. The oldest existing embroidered pieces that are available for reference are from the 16<sup>th</sup> century ad, which include textiles exported to Europe or articles prepared for royalty.

different embroidery styles have developed regionally in India that has a distinct identity of their own. Cotton, silk, woolen thread or gold/silver is used to embroider on various media, from cotton, silk, woolen fabric to velvet and leather. Besides thread, pieces of fabric, beads, mirrors, shells, coins, precious stones and sequins are also used for embellishing the fabric. With the passage of time, a variety of embroidery designs have been created by artisans from their own imagination.

The Indian embroideries can be classified on the basis of the technique of production or as per the region of production.

In this chapter the Indian embroideries are classified on the basis of region as follows:

**a. Northern India:**

- i. Kashida from Kashmir
- ii. Phulkari from Punjab
- iii. Chamba rumal from Himachal Pradesh

**b. Western India:**

- i. embroidery from gujarat
- ii. Parsi embroidery

**c. Central India:**

- ‡ Chikankari from uttar Pradesh
- ‡ Phool Patti ka Kaam from Uttar Pradesh
- ‡ Zardozi from Uttar Pradesh

**d. Southern India:**

Kasuti from Karnataka

- a. lambadi embroidery from Andhra Pradesh

**e. Eastern India:**

- a. Kantha from West Bengal
- b. Sujani from Bihar
- c. Pipli appliqué from Orissa

## **5.2 Kashida for Kashmir**

**Region:** Kashida is an embroidery style from Kashmir that is practiced by men folk of the region.

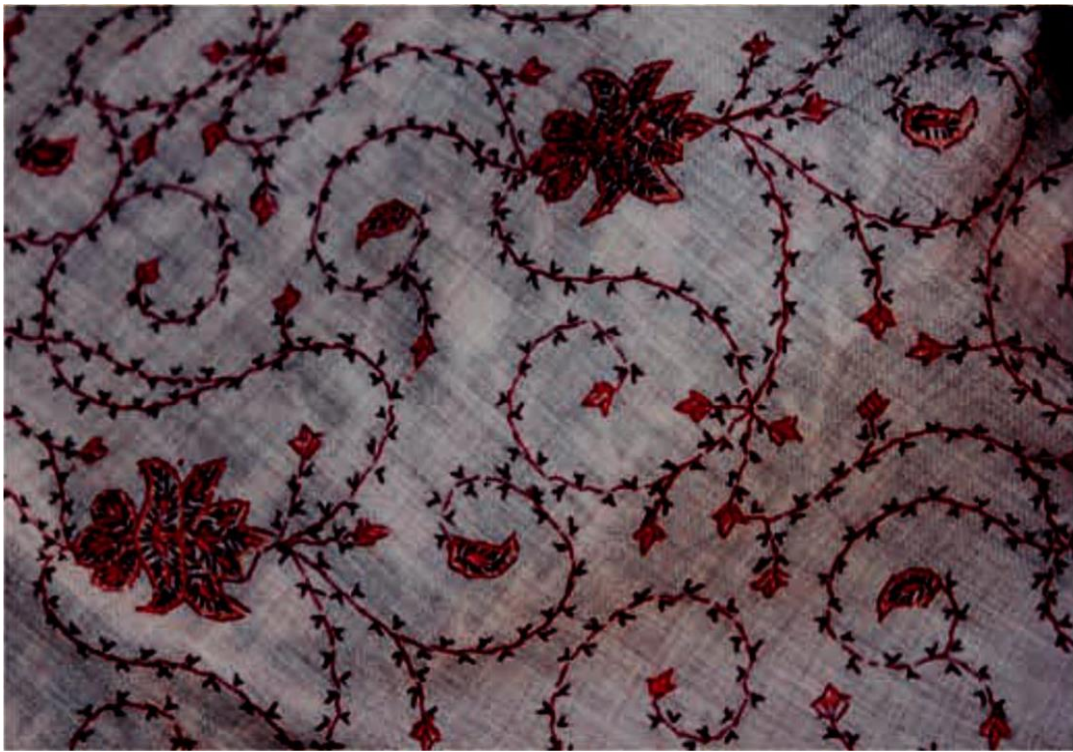
The intricate needlework is inspired from the charming natural surroundings of Kashmir.

**Technique:** The base material for Kashida is cotton, wool or silk in a variety of colors like white, blue, yellow, purple, red, green and black. The embroidery threads used to execute Kashida are wool, silk or cotton depending on the product to be embroidered. The main stitches employed for Kashida are darning stitch, stem stitch, satin stitch and chain stitch.

**Motifs:** The motifs used in Kashida depict the natural elements which includes the rich flora and fauna of the region of Kashmir. Typical motifs are birds like magpie, kingfisher; flowers, butterflies, maple leaves, almonds, cherries, grapes and plums. A popular motif seen on embroidered shawls is derived from the cypress cone.

**Style of embroidery:** There are three styles of embroidery followed in Kashmir. Sozni is intricate embroidery that uses stitches like fly stitch, stem stitch and darning stitch (Pic. 1.1). The aari style, also called Zalakdozi employs hook or aari to fill-in motifs with chain stitch (Pic. 1.2). In Kashmiri couching, zari thread is laid on the fabric along a pattern and is held in place with another thread (Pic. 1.3).





**Pic. 1.1: Sozni style of embroidery on shawl**



**Pic. 1.2: Kashmiri couching using zari thread on shawl**





**Pic. 1.3: Zalakdozi style of embroidery**

**End use:** Kashmiri embroidery is primarily done on shawls and regional garments like *phiran*. Chain stitch embroidery is done on woolen floor rugs called Gabbas and Namdas. Nowadays, Kashida is also used to decorate household items like bed covers, cushion covers, lampshades, bags and other accessories.

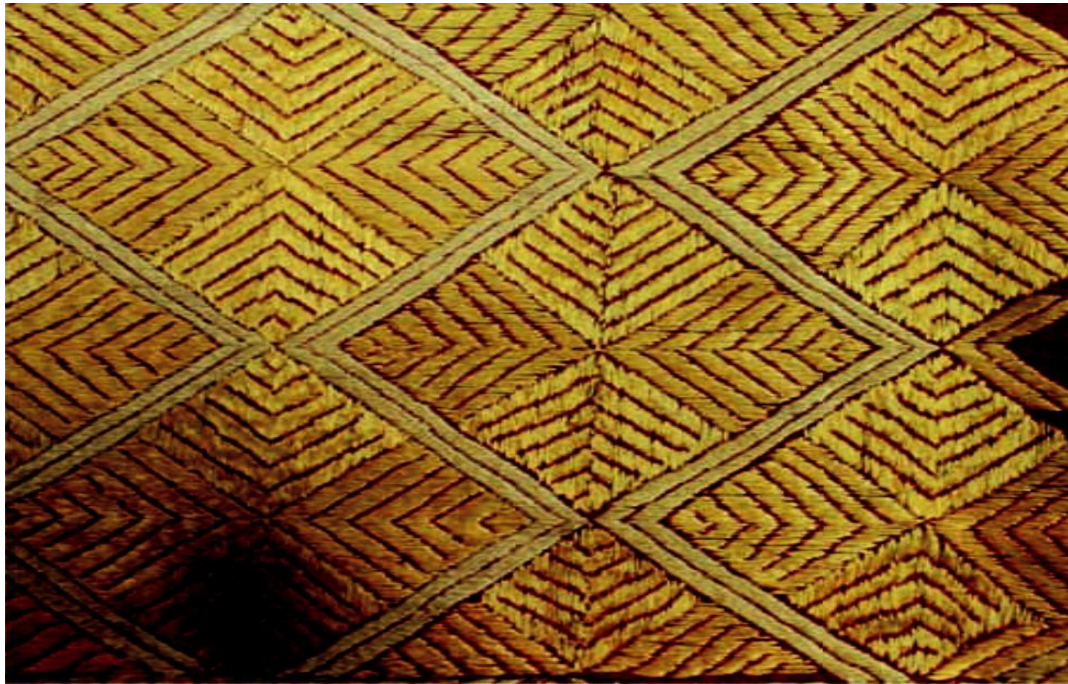
### 5.3 Phulkari From Punjab

**Region:** Phulkari is an embroidery style that originated in Punjab. It is used and embroidered in different parts of Punjab namely Jalandhar, amritsar, Kapurthala, Hoshiarpur, Ludhiana, Ferozepur, Bhatinda and Patiala.

The earliest available article of phulkari embroidery is a rumal embroidered during 15th century by Bibi Nanaki, sister of Guru Nanak Dev. The needlework is widely practiced by the women of Punjab and holds significance in a life of a woman, from her marriage till her final abode to heaven.

**Technique:** The base material to execute Phulkari is handspun and hand-woven *Khaddar* that is dyed in red, rust, brown, blue and darker shades. Soft untwisted silk thread 'Pat' is used for the embroidery. The colours of the thread are red, green, golden yellow, orange, blue etc. The basic stitch employed for Phulkari is darning stitch, which is done from the reverse side of the fabric. The stitches follow the weave and a beautiful effect is created on the fabric by changing the direction of

the stitches (Pic. 1.4). For outlining of motifs and borders, stem, chain and herringbone stitches are sometimes used.



**Pic: 1.4 Close view of Phulkari embroidery**

**Motifs:** The motifs used in Phulkari are inspired by objects of everyday use like rolling pin, sword, flowers, vegetables, birds, animals etc. They are generally geometrical and stylized. Usually one motif is left unembroidered or is embroidered in an offbeat colour. This motif is called 'nazarbuti' which is considered to ward off the evil eye.

**Style of embroidery:** The two embroidery styles prevalent in Punjab are Bagh and Phulkari. Bagh is a fully embroidered wrap that is used for special occasions whereas Phulkari is simple and lightly embroidered for everyday use (Pic. 1.5).



**Pic. 1.5: Close view of Bagh, fully embroidered wrap**

**End use:** Phulkari is an important part of the bridal trousseau and is worn as a veil or wrap by women on special occasions like Karva Chauth, a festival celebrated in North India for longevity of husbands. A specific pattern of Phulkari is also used as canopy on religious occasions.

Presently, Phulkari is being done on bed linen and apparel like tops, tunics and skirts.



## 5.4 Kantha from West Bangal

**Region:** Kantha is an embroidery style that originated in West Bengal. In the past, it was used to transform old, used fabric into an embroidered textile.

**Technique:** The embroidery is executed on layers of old white cotton saris that are stitched together with simple running stitch in white thread. The motifs are traced and embroidered using different coloured threads. The embroidery threads used are drawn from the old sari borders. The basic stitch used is running stitch along with satin stitch and chain stitch (Pic. 1. 6)

**Motifs:** The motifs used in Kantha are lotus flowers, floral scrolls, tree of life, creepers; animal and bird forms; fish, sea-monsters, mermaids, ships, submarine scenes; domestic articles like mirrors, pitcher, nut cracker, umbrella, musical instruments and human figures like gods and goddesses, horse man, fisherwoman etc. (Pic. 1.7).



**Pic. 1.6:** a close up of Kantha embroidery executed with running stitch



**Pic. 1.7: Kantha with florals, human figures & elephant motifs**

**Style of Embroidery:** different embroidery layouts are followed in Kantha. Some examples are: a central motif and tree of life on all four corners, motifs arranged in panels or a big central panel and smaller motifs placed around.

**End Use:** Kanthas were mainly used as quilts and also offered to special guests to sit or sleep on it. It was presented to the bride and groom as well as used to wrap valuables and gifts. Other uses of Kantha include bags for keeping money and book cover.

Nowadays, Kantha embroidery is done on single layer of white or coloured fabric base using contemporary motifs. The product range includes stoles, dupattas, saris and suit materials (Pic. 1.8 & Pic. 1.9).





**Pic. 1.8: Close view of Kantha embroidery on sari**



**Pic. 1.9: Contemporary Kantha**

## 5.5 Chikankari from Uttar Pradesh

**Region:** Chikankari is white work embroidery practiced in Lucknow, Uttar Pradesh. It is believed that Nur Jahan, wife of Mughal emperor Jahangir embroidered a cap for her husband, and hence popularized this craft of white on white embroidery.

**Technique:** The embroidery is done on fine white cotton fabric with untwisted white cotton or silk thread. There are three types of stitches used in chikankari: flat stitches like stem stitch and herringbone stitch, raised stitches like bullion and French knots and pulled thread work or jali.

**Motifs:** The motifs are inspired from nature's flora including flowers, creepers and lace-like patterns.

**Style of embroidery:** a common style present in each piece of Chikankari is the shadow work. To create the light and shade effect, herringbone stitch is executed from the wrong side of the fabric which creates shadow of lighter colour on the right side and at the same imparts an outline to the motif. (Pic. 1.10 & 1.11).



**Pic. 1.10:** Herringbone stitch visible on the wrong side of the fabric



**Pic. 1.11:** Shadow effect created on right side of fabric

**End use:** Traditionally the embroidery was done mainly for male garments such as *kurta*, *bandi*, *choga* etc. for summer wear.

## Exercises

1. Match the following:

- |                |               |
|----------------|---------------|
| a) Zalakdozi   | a) Chikankari |
| b) Shadow work | b) Phulkari   |
| c) Mirror work | c) Kantha     |
| d) Bagh        | d) Kashmir    |

2. State whether the following statements are True or False. If False, write down the correct one.

- a) The basic stitch used in Kantha is cross stitch.
- b) Soft untwisted silk thread 'Pat' is used for to do Phulkari embroidery.

3. Find the odd one out.

- a) Phiran, gara, Namda, gabba
- b) Mochibharat, Zalakdozi, Sujani, aari
- c) Herringbone stitch, Cross stitch, Stem stitch, Pulled thread work

4. Fill in the blanks.

- a) The basic stitch used in Sujani is \_\_\_\_\_ stitch.
- b) The motif used in Phulkari to ward off evil eye is called \_\_\_\_\_ .

5. Write short notes (75 – 100 words) on the following:

- a) Chikankari