Learning Objectives

The learning objectives of this unit are:

- Describe the process of special types of printing.
- List the advantages and disadvantages of special prints.

9.1 Flock Printing

Tiny particles of fibers (1/10” – 1/4”) are made to adhere to a fabric surface in accordance to a particular pattern design.

Rayon’s and nylon fibers most popular.

Fibers are dyed prior to flocking.

Printing the design with adhesive.

Exposing the fibre flock to the fabric.

The flock is held to the fabric only in those portions where the adhesive was first applied.

9.2 Mechanical Flocking

The fibre flock is shifted on to the fabric while the fabric is passing in open width through flocking chamber.

Mechanical beaters cause fabrics to vibrate, and become the fibres to stick on the fabric.

The alignment of fibres in the print pattern will not be uniform.

9.3 Electrostatic Flocking

Flock particles are given electrostatic charge, which helps rests all fibers being oriented in an upright position when they adhere to fabric.

Slower and more costly, but results in a more uniform and denser flock.

The ability of flocked fabric to withstand dry cleaning and washing depends quality & characteristics of adhesive.
9.4 Warp Print

Warp Prints involve printing the warp yarns of a fabric before it is placed on the loom for weaving.

The fabric is woven with a solid colour weft usually white or contrast colour.

The result is a soft, shadowy design on the fabric.

Producing warp prints require careful and skilled labour.

These prints are found almost exclusively on high quantity and expensive fabrics.

9.5 Burnout Print

Printing with chemical substance (sulfuric acid) that will destroy the fibre in the pattern design print area.

The printed pattern would become transparent and stiffer.

Generally used for cotton and rayon fabrics.

Fabrics are used in low-cost summer blouses and cotton lingerie.

Interesting designs can be created with blends.

9.6 Duplex Print

Fabrics in which both sides of the fabric have been printed.

Most often they are made to imitate woven yarn dyed design effects such as stripes, checks and plaids.

Imitate Jacquard & Dobby woven design fabric.

Very expensive printing.

9.7 Engineered Print

Prints that have two or more distinct designs, each located in separate areas of the fabric, and each designed to become a specific part of the garment.
The placement within the print and yardage of each of the design elements must be carefully worked out so that optimum fabric utilization can be achieved with minimum wastage. Printed by hand screen or heat transfer methods.

9.8 Khadi Print

Khadi printing is usually carried out on a dyed fabric with a paste containing a white opaque pigment like Ti02, thus producing a white effect on a coloured ground.

By adding a colour pigment, a coloured khadi effect can be obtained.

When a white pigment like Ti02 is printed on a lustrous rayon fabric, a matt pattern on a lustrous ground is obtained.

This process is known as 'DAMASK PRINTING'.

White and colour khadi printed on dark ground gives attractive raised patterns resembling discharge or resist effect.

The process is very simple and economical. Because of the larger particle size of white pigment, better results are obtained by adopting lower screen meshes.

9.9 White Khadi Recipe

Generally Ti02, binder and glycerine are mixed well and soaked overnight for better printing results.

By adding pigment colour (up to 6%) to the above paste colour, khaki effects can be obtained.

Other thickenings viz. MTO emulsion (or) water based synthetic pastes, as per requirements can be used.

Khadi Print Process

**Print Dry(120°C) Cure - 150°C for 4-5 min (for DAP catalyst) (Or) 110°C for 4-5 min (LCP catalyst)**

The harsh feel of excess Ti02 and binder, can also be countered, by the use of softeners.

To avoid any wet treatment after printing, it is usual practice to print khadi on finished fabrics.

Khadi print is best suited for single fibre (or) blended fabrics.
9.10 Plastic Print

Plastisols are thermoplastic inks.

The inks are produced by blending vinyl chloride dispersion resins with high boiling point organic solvents, plasticizers, pigments etc.,

The dry ingredients are in suspension and when the ink is subjected heat, the resin particles soften, swell and absorb the liquid part, melting together forming a film on the fabric.

To make them more permanent, plastisol inks are dried and are polymerized by the application of heat.

Here two types of printing are employed.

Using inks, which is directly applied on to the fabric.

Using plastisols in transfer paper.

Here white PVC is used for white prints. Pigment inks are used for colour prints.

The main advantages of plastic prints are:

It has high opaque build up and flexibility.

They give bright colours directly on dark grounds.

These prints have better fastness.

It is used for all kind of fabrics and surfaces.

Plastisol inks are easy to use.

T-shirts with fancy prints, occupy a major role because of permanency, brightness and attractiveness.

The main disadvantages are:

They do not withstand dry-cleaning.

When ironed at high temperature the design re-melts.

9.11 Rubber Print

PVC polymer based plastiols even though offer bright, attractive, opaque prints are prone to cracking effect due to rigidity of polymer layer.
This problem is evident in printed T-shirts or children wear that any flexing in usage cracks the prints, apart from harsh feel of printed portion.

In order to overcome this defect, modern plastisol formulations are made with co-polymers of PVC and Butadiene or polyurethane.

This system renders flexibility of printed film during usage without cracking and gives elasticity to the prints.

**Foam binder** consists of an opaque polymer emulsion of printable viscosity containing a blowing agent.

This agent decomposes on application of heat liberating nitrogen gas.

During the stage of curing, the blowing agent present in the paste decomposes, and the liberated gas raises the polymeric film at the printed portion, which gives an embroidery look. The volume is increased to 50 times on blowing up.

Coloured effect can be obtained by using pigments.

The **fluorescent pigments** are available in powder form.

Direct mixing of fluorescent pigments in the foam binder results in **non-uniform prints**.

It is recommended to make first a smooth paste of the fluorescent colours with pigment printing binder and then mix them with foam binder.

The overall effect resembles **raised embroidery pattern**.

**Pearl Print**

Metallic prints even though offer shine and lustre, are marked by harsh feel on the printed portions.

This can be overcome by pearl prints.

This system involves binder, fixer, and catalyst components along with titanium dioxide.

The extra shine is enhanced by incorporation of **pearlascent salts** like lead carbonate, Bismuth oxide chloride (Biocl) or Bismuth tri-chloride.

This combination is called **pearl print**.

This can be used in self as white pearl or in combination with pigments to get multi colour or metallic effects with soft feel.
9.12 Pearl Print – Process

Print Dry at 120°C, Cure at 150°C for 4 to 5 minutes.

9.13 Glitter Print

These printing differ from metallic (gold, silver, and copper) or pearl prints.

The particle size of the glitter powder is much bigger (250 - 500 μ) compared to metallic or pearl powders.

The effect of glitter prints is therefore more prominent compared to metallic or pearl prints.

Metallized polyester film glitter:

The colour of this glitter powder is not resistant to solvents

Anodized aluminium glitter:

The glitter powders have the hiding power. Therefore, it can be used on white and dark grounds. The effect is much better on dark grounds.

9.14 Conclusion

To summarize, in this unit, you have learnt about:

- Flock Printing
- Warp Print
- Burnt Out Print
- Duplex Print
- Engineered Print
- Khadi Print
- Plastic Print
- Rubber Print
- Foam Or Puff Print
- Pearl Print
- Glitter Print