

ICT - TRAINING MATERIAL

FOR ADVANCE LEARNERS

PREVIOUS YEAR UNIVERSITY QUESTION &

ANSWER FOR THE SUBJECT "WET PROCESSING"

PREPARED BY

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Part A

1. Define processing?

In wet processing, before doing the process the fabric is given some treatment called pre-treatment and after completing the process, the fabric is given another treatment called after treatment, this is called processing .

2. What is meant by dry processing?

The process will be done in the dry condition is called as dry process.

3. How is singeing done?

Singeing is the process of removing the loose hairy fibres projecting from the surface of the fabric by burning . These are done to give a smooth , even and clean looking face to the fabric.

Types of singeing:

1. Hot plate
2. Roller singeing
3. Gas Singeing

4. On which fabric is mercerization done?

Mercerization is done to increase the good luster , absorbing capacity , strength of material. Cotton is mainly mercerized. and other thick fabrics .light weight fabric do not mercerized.

Machine used for Mercerization.

Chain Mercerizing material

Chainless

Chainless pad less mercerizing machine.

5. How is vat dyeing done on the fabric?

These dyestuff are not soluble in water .it can be converted into soluble compounds by the action of reduction agent such as sodium hydro sulphide. Cellulose has

affinity for leuco component. After the leuco component is absorbed by the fibers is absorbed by the fibers, they are oxidized by the original insoluble form.

Process

- Vatting
- Dyeing
- Oxidation
- Soaping

6. What method is used to dye silk?

The silk is dyed with the similar method of wool dyeing except the fact. 5% of acetic acid is used instead of 5% sulphuric acid as it may damage the silk fibre. Retarding agent is not normally required.

7. How is printing process done on fabric ?

It is a process of producing attractive designs on textile fabric using one or more dye stuffs. Printing is localized dyeing . Printing is nothing but applying within boundaries of designs

Styles of printing

Direct style

Discharge style

Resist style.

8. On what type of fabric is roller printing suitable and how ?

The main distinguishing features of roller printing is that it is a mechanized process. The patterned effect is produced with the help of a machine with engraved roller.

Type of fabric:

Cotton, Linen and dots.

9. Name the two type of finishes that have aesthetic appeal?

Mercerisation improves the luster of cotton fibers. Also gives the cotton material a great affinity for colouring matters. To improve the lustre of the fabric.

Schreinerizing is inexpensive method for imparting luster to low priced cotton the Schreinerizing produces a luster simulating that of silk.

10. what is meant by embossed finish ?

The process of producing raised figures or designs in relief on surface of the fabric by passing the cloth between heated engraved roller is known as embossing. To preserve the embossed finish, never be bleached given to the particular fabric

PART - B

11. a) write the need for processing?

PROCESSING

In wet processing, before doing the process the fabric is given some treatment called pre – treatment called pre – treatment and after completing the process, the fabric is given another treatment called after treatment, this is called processing.

Need for Processing:

There are two types of processing.

- **Pre – Treatment**
- **After Treatment**

Pre –treatment is done to remove the impurities like seed, oil, excess size paste, natural yellowish color, etc from the fiber (or) fabric. There are many types of pre – treatment and each has its own function.

Singeing :

Removal of loose hairy fibres protruding (or) projecting from the surface of fabric by burning. A fabric should be singed because when mercerized, it will develop maximum luster in fabric. The fabric to be printed must be singed to impart clearly defined and sharp designs on the cloth.

Desizing :

Removal of size material present in the fabric. This process helps in increasing the capacity of absorbency in the fabric for further processing.

Scouring :

Removal of all impurities except natural colouring matter present in the textile material, after scouring is completely removed.

Bleaching :

Removal of Natural colouring matter present in the textile material, after scouring is completely removed.

Souring :

Neutralising the fabric and remove the chlorine smell and also improve the whiteness of the fabric.

Mercerising :

This is done to increase the good lusture absorbing ,capacity , strength of material.

After treatment :

After treatment is done to improve the fastness property of the dyes & print pastes .

Washing :

Washing is a kind of after treatment . The fabric is hot washed or cold washed accordingly , for 2-3 times or as needed . It should be ensured that no acid or any impurity is left out in the fabric . If any small quantity is present , it will lead to damage in fabric.

Soaping :

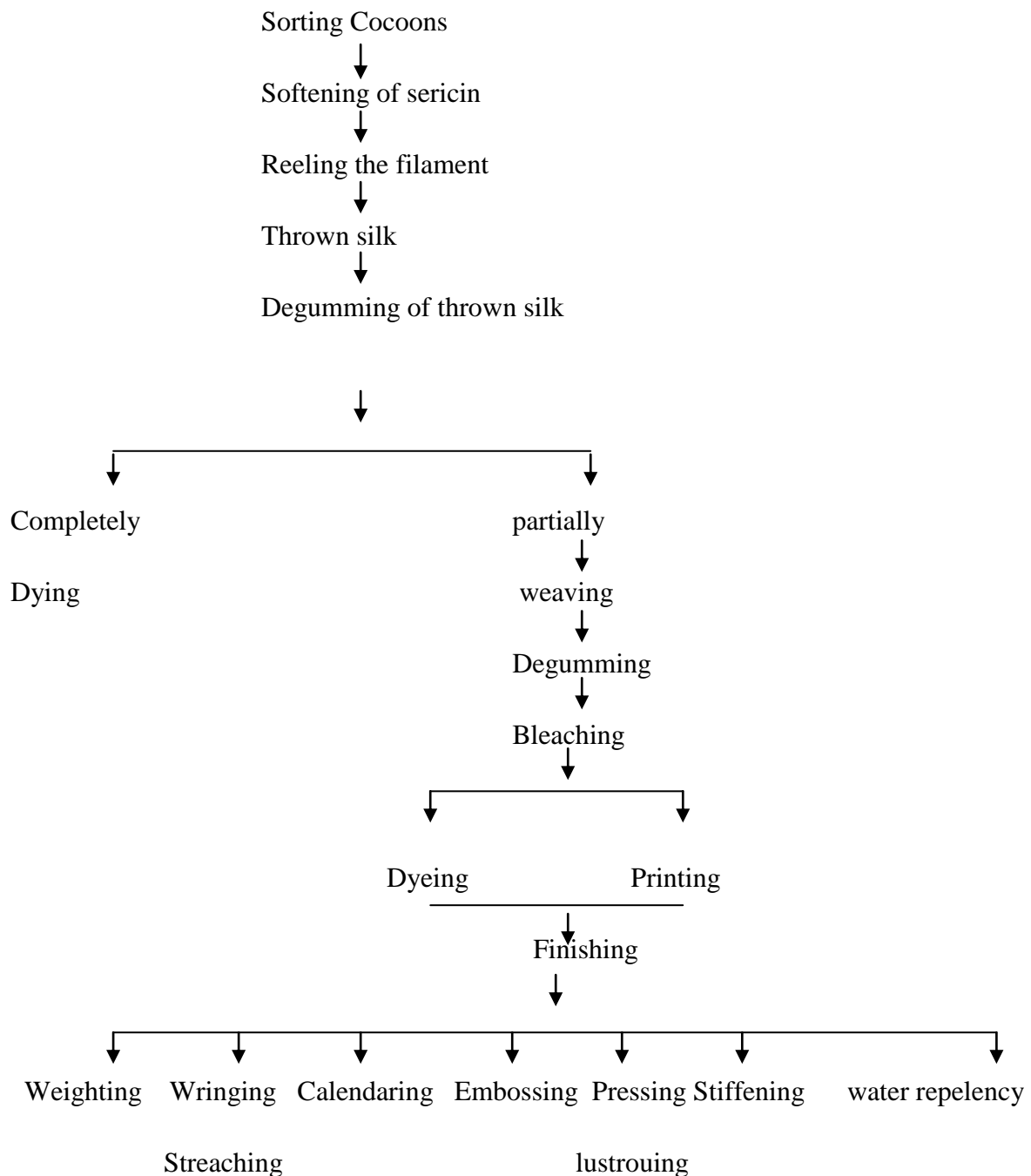
Soaping is also a kind of after treatment . The fabric is first hot or cold washed and then soaping treatment is done by using 5gpl soap and 1gplsoda Ash and set at required temperature for 15 min for soaping treatment to take place.

Curing :

The fabric after drying is made (or) set for curing at 160oc for 1-3 min .

11 (b) Write notes on wet processing on silk and wool?

Process sequence for silk:



Sorting Cocoons :

The cocoons are sorted according to color, size, shape and texture, as all these affect the final quality of the silk. Cocoons may range from white or yellow to grayish, depending on the source and the type of food consumed during the worm stage. Cocoons from China are white, Japanese cocoons are creamy white and yellow, Italian cocoons are yellow.

Softening the sericin:

After the cocoons have been sorted, they are put through a series of hot and cold immersion as the sericin must be softened to permit the unwinding of the filament as one continuous thread..

Reeling the filament

The process of unwinding the filament from the cocoon is called the reeling. The care and the skill used in the reeling operation prevent defects in the raw silk.

Thrown silk :-

Reeled silk is transformed into silk yarn also called silk thread – by a process known as throwing.

Degumming of thrown silk :

Thrown silk yarn still contains some sericin that must be removed in another soap bath to bring out the natural luster and the soft feel of the silk. As much as 25% of the weight is lost by the degumming process.

Dyeing :

Dyeing is the process of colouring textile material by immersing them in an aqueous solution of dye, called dye liquor. normally the dye liquor consists of dye, water and auxiliary to improve the effectiveness of dyeing, heat is usually applied to the dye liquor.

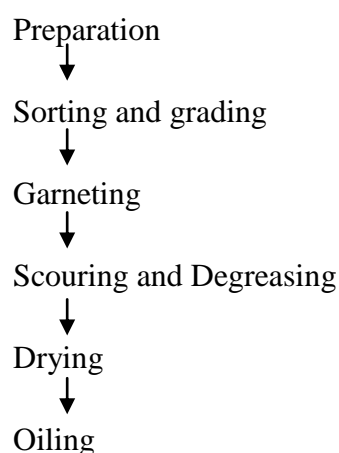
Printing :

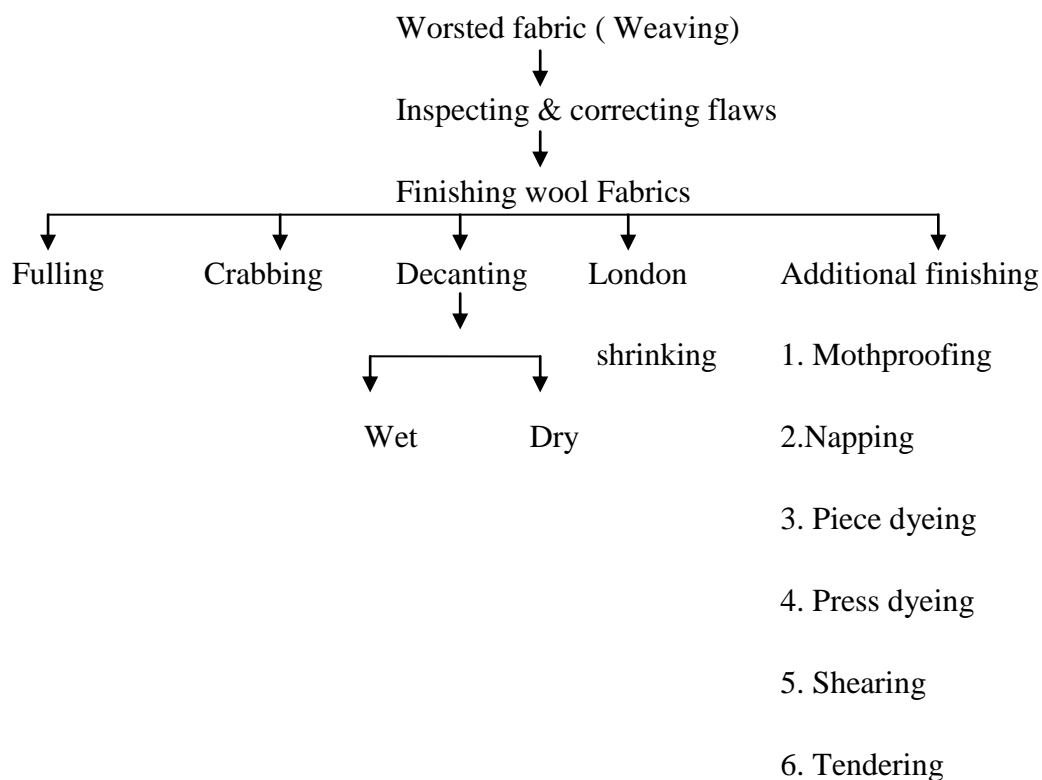
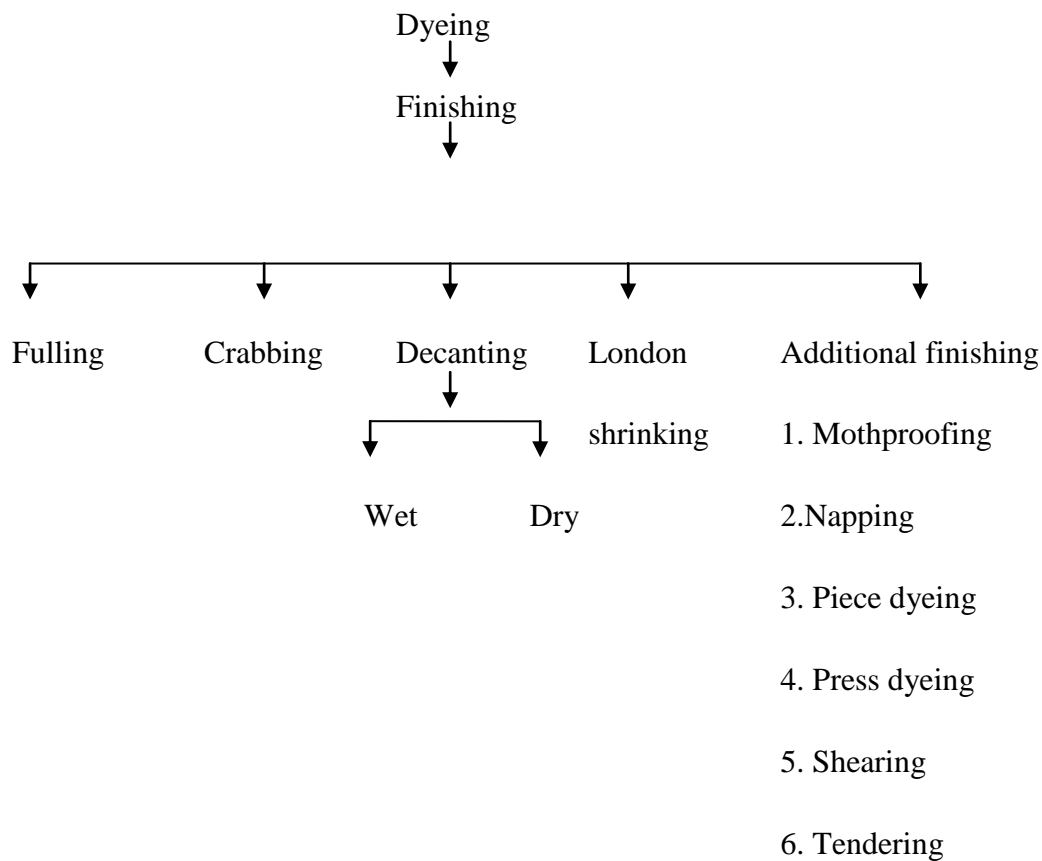
Printing is nothing but applying colours within boundaries of the designs. The different styles of printing method like block, screen, flat bed screen, rotary screen, transfer printing, etc.

Finishing :

Finishing is one of the essential process. This is done according to the end use of the fabric. some of the finishes done in silk.

Process sequence of Wool :-





Sorting and Grading :

Wool sorting is done by skilled workers who are expert in distinguishing qualities by touch and sight . Each grade is determined by type , length , fineness, elasticity and strength.

Garnetting :

Recycled wool fibres are obtained by separately reducing the unused and used material to a fibrous mass by picking and shearing process called garnetting.

Scouring :

The next step in preparing raw wool for manufacturing is through washing in an alkaline solution. This process is known as scouring.

Drying :

Wool is not allowed to become absolutely dry. Usually, about 12 to 16 percent of the moisture is left in the wool to condition it for subsequent handling.

Oiling :

As wool is unmanageable after scouring, the fibre is usually treated with various oils, including animal, vegetable, and mineral, or a blend of these to keep it from becoming brittle and to lubricate it for the spinning operation.

Dyeing:

If the wool is to be dyed in raw stock, it is dyed at this stage. The advantage of stock dyeing has been described. Some wool fabrics are piece-dyed, some are yarn or skein-dyed, and some are top-dyed.

Weaving Worsted Fabric:

The worsted yarns, which have been specially carded and combed, are woven into fine worsted fabric with distinctive patterns, chiefly by means of twill weave. Worsted fabrics are firm, smooth or rough and wiry or harsh. Worsted fabrics are costlier than wool. They are suitable for business wear.

Inspecting and correcting flaws :-

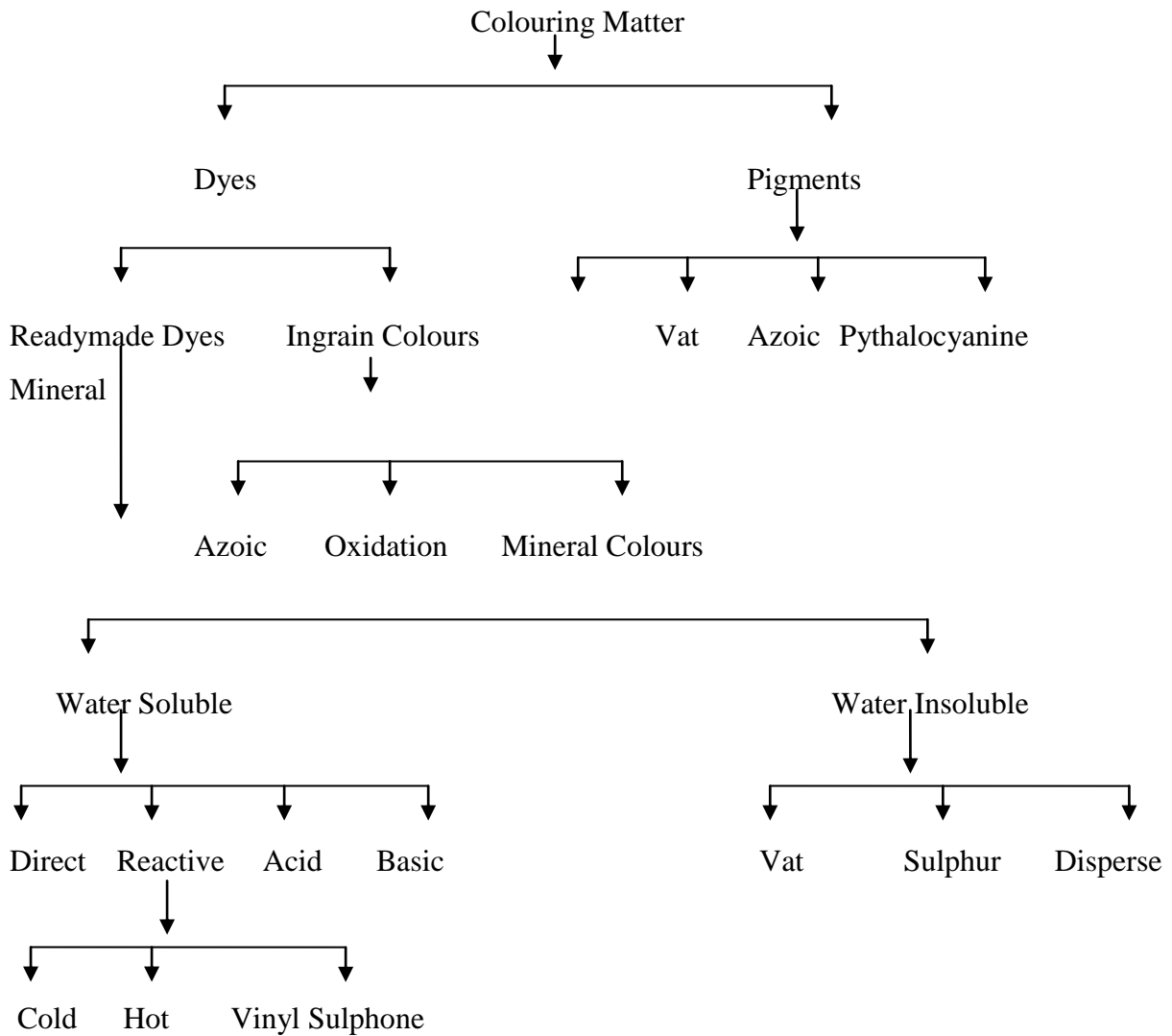
Prior to various wet and dry finishing processes, wool fabrics are checked, or examined for defects, which are marked with chalk. It is corrected by burring and specking.

Finishing the wool Fabric :

Wool fabrics are given a variety of finishes similar to these applied to cotton and linen . But the nature of wool is that certain other finishing processes are used to obtain a compact , firm body and hand .

Some of the finishes are Fulling, crabbing , London shrinking.

12 . a) Write the Classification of dyes ?



Suitability of Dyes :

Dyes for Cellulosic Fibres like Cotton , Viscose , etc.

Direct , Reactive , Vat , Sulphur , Azoic, and pigments.

Dyes for Protein Fibres like Wool and silk

Acid , Basic and Reactive dyes to some extent

Dyes for polyamides like Nylon 6 , Nylon 66 etc

Acid and Disperse

Dyes for Polyester – Disperse dye only

Dyes for Acrylics – Basic and disperse dyes

12b. Write notes on Naphthals and Acid dyes?

NAPTHALS;

Naphthals are H₂O insoluble. To dissolve it 2 step involved.

1. hot dissolving
2. cold dissolving

In hot dissolving required shade % of naphthal is taken & made into a paste with wetting agent. (Turkdy Red Oil)



T.R.O is anionic wetting agent. 70°C hot water is taken & paste is added & stirred. It gives milky soly. Then equal amt of NaOH is added and stirred till clear sol. is obtained. If not it is heated till sol is obtained.



Insoluble Aromatic Hydroxides (Naphthals) converted to soluble Sodium Salts.



Treating with Naphthal Soly:



Exhaust method



Jigger dyeing Machine is used.



Fabric is loaded Material to liquor ratio water is taken & set in Room temp.



Circulation starts.



Naphthal sol is added.



(half soly. Per end – 2 end)



Depending upon Naphthal exhaust so is added.

10-50 gpl Nacl (Half quantity perend-2



Blank run (4 ends)Material taken out & squeezed



Excess Napthal will be removed.

ACID DYES

Dyeing of wool with acid dye

The acid dyes are so called as they are applied in acidic condition. These dyes are particularly suitable to dye protein fibers like Wool, Silk and polyamide fiber (Nylon) they are sodium salts of sulphonic acid and hence water soluble.

Properties

1. They are water soluble
2. Wide range of colour is available
3. It is pure dye
4. It is anionic dye
5. Fastness properties

Wash fastness - 5

Rubbing fastness - 5

Light fastness - 4

Types of acid dyes

- | | | | |
|-----------------------|---|-------------------|------------|
| 1. Levelling dyes | - | Strongly acidic | pH <4 |
| 2. Milling dyes | - | Moderately acetic | pH-4-5 |
| 3. Super milling dyes | - | Weakly acetic | pH-5-6 |
| 4. Neutral dyes | - | slightly acidic | pH -6.5 -7 |

Procedure

Dye is taken as shade % and pasted with a small quantity of wetting agent

The dye bath is made up M:L ratio . The temperature is raised to 50oC.Dye solution is added .10gpl Glabour salt is added as retarding agent or leveling agent .

5% sulphuric acid – H₂SO₄ (owf) is added in two installments with a time in travel of 15 min as exhausting agent . It ionizes . the amine groups in the wool fiber as positive charged ions. Hence they attract negative charged dye ions , which rush towards the fiber at a faster rate leading to unevenness. Initially , the concentration of dye in the dye bath is maximum and to prevent this rush , a retarding agent or leveling agent is added. The dye couples with the fiber with IONIC BOND

Dyeing is continued at 60o C for 30 min

Washing for 10 Min

Soaping 5 gpl soap for 30 min

Washing for 10 min

13 (a) Write the method of dyeing wool?

Dyeing of wool with acid dye

The acid dyes are so called as they are applied in acidic condition. These dyes are particularly suitable to dye protein fibers like Wool, Silk and polyamide fiber (Nylon) they are sodium salts of sulphonic acid and hence water soluble.

Properties

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Types of acid dyes

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Washing for 10 Min



Soaping 5 gpl soap for 30 min



Washing for 10 min

13b) Discuss the method of dyeing fiber blends?

Fiber Blend

The combined of two fibers is called as fiber blend . for example wool and are silk are blend .Because they dyed by using Basic dye.

Dying of wool and silk with basic dyes



Dye is taken as per shade % and pasted with a small quantity of Acetic. Acid. Excess water is added and stirred



The dye bath is made up to M.L. ratio. the temperature is raised to 50oC. Dye solution is added. 10 gpl Glabour salt is added as retarding agent or leveling agent. The pH of the bath is neutral or slightly acidic (6.5 – 7). The carboxylic acid (COOH) group present in the Wool and silk fiber are ionized into negative charged ions. Hence they attract positive charged dye

ions, which rush towards the fiber at a faster rate leading to unevenness. Initially, the concentration of dye in the dye bath is maximum and to prevent this rush, a retarding agent or leveling agent is added. The dye couples with the fiber with IONIC BOND.



Dyeing is continued at 60°C for 30 min

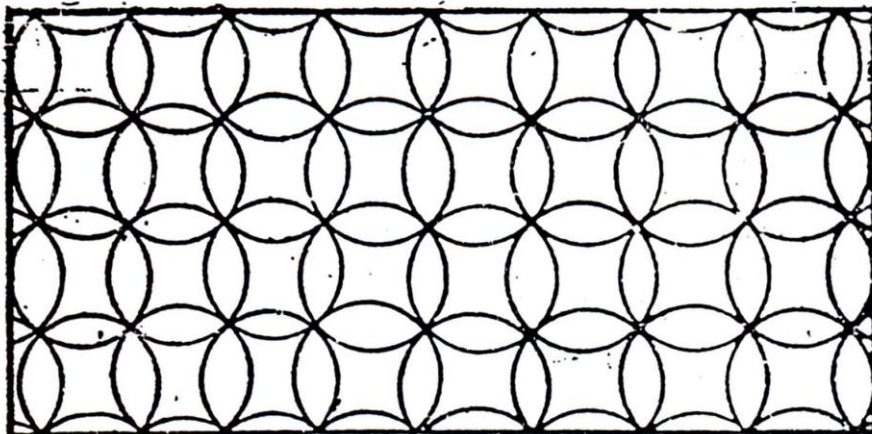


Washing for 10 min Cold soaping 5gpl soap for 30 min Washing for 10 min

14 (a).Brief on Stencil Printing?

It is also one of the oldest methods of printing. But it is not used to any great extent. Really speaking it is not a printing process at all. As a colour is applied to the fabric not by impression as in block or roller printing. But by brushing or spraying the ink through a pattern. A pattern cut out from a flat sheet of metal or water proof paper or plastic sheet or laminated sheet.

A stencil is prepared by cutting out a design from a flat sheet of cartridge paper, metal or plastic thin sheet with a sharp pointed knife. Stencils are made from thin sheet or metal. It is not possible to cut a perfect circle or a ring or another complete outline on a stencil plate which it cut would fall out of the pattern at once leaving a spot. To prevent this some from a "Tie" is used to link such shapes to main stencil.



In actual practice this stencil is perfectly flat on the fabric to be printed and the colour paste is then brushed through its perforation with a brush. The plate is then lifted when the pattern appears on the cloth as a coloured silhouette corresponding with the cut out part of

stencil . in patterns with two or more colour . A separate stencil is required for each cloth . As in block printing cloth is stencil printing through out in one colour first and then the other colour are printed.

Every repeat can be coloured differently if desire the colour can be brushed , added, sponched or sprayed by means of spray gun through the stencil and then blended together with the sweep of a brush before the stencil is removed. Such effects cannot be obtained by block or machin printing

The method is mainly content to printing of wall hanging , Decorative , panel , Curtains , Bed spreads , table covers etc. Any kind of colour can be used for the pattern in this method oil colours and other are used for heavy wollen goods , velvets , jute cloth . burham etc . Even water colour can be used for lighter goods . If fast colour are not required.

14b) write notes on screen printing ?

SCREEN PRINTING :

This is an improved method of stencil printing.

“Tiles” is used only in stencils but not in screen printing .

“Ties” means the imputed portion (or) the supporting portions.

D/b two methods: (i.e.,) screen & Stencil printing.

Screen printing – tightly stitched of thin silk gauze on which the pattern is painted in such away that unpainted parts correspond to the preparation in the stencil plot & perform exactly same fun. Design can be transferred using rubber or wooden squeegee. Stencil printing will be done in using brush only. Can produce any type of design as needed by the designer & even large motifs can be done, which cannot be done in stencil printing. This is pos in screen printing bcoz “Ties” are not there in screen printing.

Equipment required:

Screen, squiregees, wooden(or) concrete tables

Table sizes - 75 cm

120 – 160 cm wide

30 – 60 m long

The top of the table will look like inclined.

Inclined gradient – 2.5 cm.

Table covered with wooden felt cloth of thickness 6 mm Above that cotton back gray if cloth is to be fixed with pin (or) if gum is used, water proof fabric (or) covering should be used.

Up to 20 lay can be done without gumming.

Guide rail - registration of designs with dis adjustable pegs (or) metal stocks will be used to maintain equal widths from one design to another on sides of guide rail.

A + Bottom of Table – a provision is done for electrically heating the fabric.

Advantages of Screen Printing:

- i) The method is simple to operate and does not require elaborate and expensive equipment:
- ii) This method enables, new patterns to be produced quickly and without a large initial expense, since the screens can be produced cheaply:
- iii) The method is useful for printing knitted rayon fabrics which cannot be manipulated satisfactorily on the roller printing machine,.
- iv) The method is economical in production and manually less exacting than block printing.
- v) Blotch designs can be printed by this method which cannot be printed by block or roller printing: further, it is possible to produce larger repeats than those in roller printing.

Disadvantages of Screen Printing:

- i) For high production a large number of tables have to be used requiring huge space with incidental overheads in roller printing, the space required is very much less.
- ii) Delicate shading and gradation of colour are difficult to obtain by this method and the joint marks at the repeats are often perceptible.
- iii) Fine-mesh screens used for sharp line effects often get choked rendering the screen redundant.

15.(a) Write short Notes on Calendering and Stiffening finishes?

Calendering :

Object:

- To upgrade the fabric handle and to impart a smooth silky touch to the fabrics.

- To compress the fabric and reduce its thickness
- To improve the opacity of the fabric
- To reduce the air permeability of the fabric by changing its porosity
- To impart different degree of Lustre to the fabric.
- To reduce the Yarn Slippage.

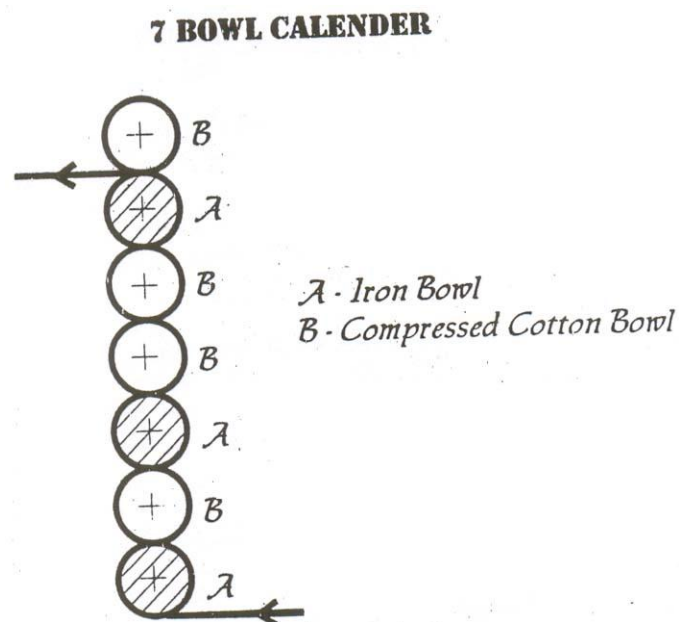
There are Six types of Calendering Machine

- 7 Bowl Calender
- Swizzing Calender
- Chasing Calender
- Friction Calender
- Schreiner Calender
- Felt Calender

7 Bowl Calender

It is one type of calendering machine.

In a typical 7 bowl calender, the arrangement of the bowl is shown below



The calendering effect produced depends on the ;

1. The moisture content of the fabric.
2. The number of bowls used in the calendar.
3. The composition of the bowls.
4. The arrangement of bowls
5. Temperature
6. Pressure
7. Speed of the machine

Generally the compressed material bowls are made from either Cotton or Wool paper, or Flax paper.

The hard bowl is made up of either Chilled Iron or Close Grained Cast Iron or Steel

Iron bowls are made with highly polished surface and are heated from inside by steam or gas.

The fabric is passed through the machine in between the bowls and as the result Gloss is developed in the calendered fabric

They run at a speed of 8 mts/min

In this machine, there are 3 iron bowls and 4 cotton bowls

In between two metallic bowls, one cotton bowl is arranged

Care should be taken in such a way that no two iron bowls are arranged together to avoid damage to the fabric.

Sufficient pressure is employed by either weighting the rollers with heavy weights or by spring weighing or Hydraulic pressure weighting.

Normal speed is 60 to 80 yards/min

The normal pressure is 40 to 60 tons.

Damping – preprocess to calendaring

Damping is nothing but moistening or wetting.

Damping operation is carried out as a preprocess to calendaring.

Mechanical operation of calendaring depends on Pressure, Heat, Friction and Moisture.

Hence, before calendaring the fabric is subjected to damping where sufficient amount of moisture is added to the fabric.

As the physical properties of all textile materials vary to a very large extent with the moisture conditions, it is very important that this should receive attention before the fabric is subjected to any mechanical operation.

It is possible to allow fabrics to lie for sometime in a humid conditioning room, or more quickly to spray water directly on to the cloth or blow the steam through the fabric.

The process of spraying water or blowing steam to the fabric, makes the fabric more Flexible and prevent them from causing damage by tearing.

Stiffening finishes

To achieve the fabric stiffening using various stiffening agents is known as STIFF FINISH.

OBJECTIVES

1. To give stiffness to the fabric.
2. To increase the weight of the fabric

The most commonly used ingredients in stiff finishing are:

STIFFENING AGENTS – Starches, Polyvinyl Alcohol (PVA) Carboxy Methyl Cellulose (CMC) etc.,

SOFTENING AGENTS – Glycerine, Turkey Red Oil (TRO), Cationic, Non-ionic, An-ionic, Reactive softeners, PE Emulsion, Silicone Emulsion etc.,

WEIGHTING MATERIALS – Gypsum, Sulphate of Ca and Mg, lead, Zn, Chlorides of Mg, Ba, Zn, China clay etc.,

ANTISEPTIC AGENTS – Album, Boric acid, Phenol, Borax etc.,

Starches: (Characteristics and application)

Starches are generally used for stiff finish.

Various starches are available for this purpose.

Properties of starches

Starch is not soluble in water.

Starches swell in water

For textile application as stiffener, we should convert it into a form of paste.

To get a paste out of starch, it has to be heated in water at or slightly higher its Gelatinisation temperature.

Gelatinisation Temperature is the temperature at which the starch becomes a 'GEL' which is suitable for application. On heating with water the starch granules swell and burst at this temperature.

All the starches do not have the same Gelatinisation

Temperature.

Starch	Temperature
1. Potato	65 – 68oC
2. Tapioca	70 – 74oC
3. Maize	75-77oC
4. Rice	80 – 83oC
5. Wheat	80 -85oC

At 150oC, Starch dissolves in water.

Factors affecting the starch cooking are:

1. Temperature: As the temperature increases viscosity of paste decreases.
2. Stirring: By good stirring, we will get a homogeneous paste. However, prolonged stirring will reduce the viscosity of the paste.
3. Time: Time of boiling varies depending on the type of starch. However, in general as the time of boiling increases viscosity of paste increases.

Hence, the viscosity of the paste is governed by two factors:

1. The size of the granules,
2. 1. The ratio between Amylose and Amylopection,
3. 3. Stirring and
4. 4. Time of boiling.

The following factors are to be considered while selecting a starch for stiff finish.

1. The stickiness during ironing and drying.
2. Ease of penetration into the fabric.
3. Transparency of the starch film.
4. Effect of crushing the starched fabric.
5. The stiffness of starched fabric
6. The smoothness of the starched fabric

The quantity of the starch to be taken for stiff finish depends on:

1. Weight of the material
2. Type of weave.
3. Thickness of the fabric.

METHOD OF APPLICATION

Pad – Dry – Calender

15(b) Write notes on water proofing and water repellency.

Water proofing

“Water proofing is nothing but preventing the passage of both air and water through a fabric”

Purpose

For certain uses such as Tarpaulin, Umbrella cloth, Rain coat fabric etc., it is required to give this type of finish as these type of fabrics are generally used against the air and water in the normal life. So they should have some property to prevent both air and water passing through them.

This finish makes the wearer feel uneasy and uncomfortable as the air circulation is not there.

Principle

A film on the surface of the fabric should be formed for the prevention of air and water.

When a uniform coating of suitable substances such as rubber is produced on the surface of a fabric, the interstices between the warp and weft yarns are blocked by the continuous film or substance and both water and air will not pass through the treated fabrics.

It is a chemical and property giving finish.

Requirements :

The fabric should not become unnecessarily stiff and the fabric should have oil release or oil repellent property.

The finish should not alter the fastness properties or dyed material , feel, strength etc., of the fabric.

Method

By 2 methods , it can be3 carried out .

1. Method by which hydrophobic substances are deposited on the cloth.
2. Method by which the fabric itself becomes hydrophobic .

Chemical used

1. Vulcanised natural rubber.
2. Oxidized oils of varnishes.
3. Polyvinyl chloro acetate.
4. Polyvinylidene chloride.
5. Cellulose acetate.
6. Cuprammonium hydroxide solution .

process

- a) The simplest method of water proofing is the coating of fabric with rubber as a thin film .

Disadvantages

Unwanted stiffness and harshness.

Fabric becomes hard and brittle.

- b) The application of natural oil will also produce this finish

Advantage

No cracks or brittleness

Disadvantage

It is not permanent .

- c) Coating of water impermeable substances like pitch. Asphalt and molten waxes produce water proofing

Advantage

It will give excellent proofing

Disadvantage

Many desirable properties of the fabric will be destroyed .

- d) Using synthetic resins we can produce this finish

Eg) Polyvinyl chloro acetate

Cellulose acetate

Polyvinylidene chloride

- e) Water proofing with wax Emulsion .

It can be applied on cotton , linen wool,silkfabrics .

Aluminium acetate is used along with the wax emulsion.

There are two steps involved in producing this finish.

First step

Wax emulsion - 1-3 kg

Water - 50 liters

Pad the material with wax emulsion solution.

Second step

In wet condition

Aluminium acetate - 1-3 kg (12oTw)

Water - 50 liters

Impregnate the fabric and squeeze thoroughly . then dry the fabric in a stender or on a drying range at 110o -120oC

Process Sequence

Pad-dry – calendar.

Water repellent finish

If a fabric allows air but prevents water to pass through itself , it is known as water repellent finish.

Requirements

The fabric should not become unnecessarily stiff and harsh.

It is a Chemical and Property giving finish.

The finish should not affect the fastness properties of dyed goods and feel, strength etc.of the fabric.

METHODS

USING METALLIC SALTS

Process

Pad the fabric with metal salts like Aluminium Acetate or Lead Acetate.

Passing the padded fabric through Soap solution like Sodium Stearate.

If necessary a little quantity of wax may be added.

This method is not permanent.

USING SILICONE EMULSION

They impart not only water repellency but also soft handle and improved draping qualities.

Process

Pad – Dry – Cure

If necessary, Resin may be added in conjunction with silicone.

Catalyst should be added for permanent durable finish.

Eg. For catalyst, Organo Metallic salts.

They are added just before the application.

They pad bath contains Silicone, Resin, Emulsifier and a Catalyst.

DURABLE WATER REPELLENT FINISH

Stearoxy – Methyl Pyridium Chloride is popularly used for durable water repellent finish.

Methylol Straramide, Methylated Methylol Melamine can also be used.

A catalyst should also be added.

They chemically react with the fibers and produce durable repellent finish.

PROCESS

Pad – Dry – Cure

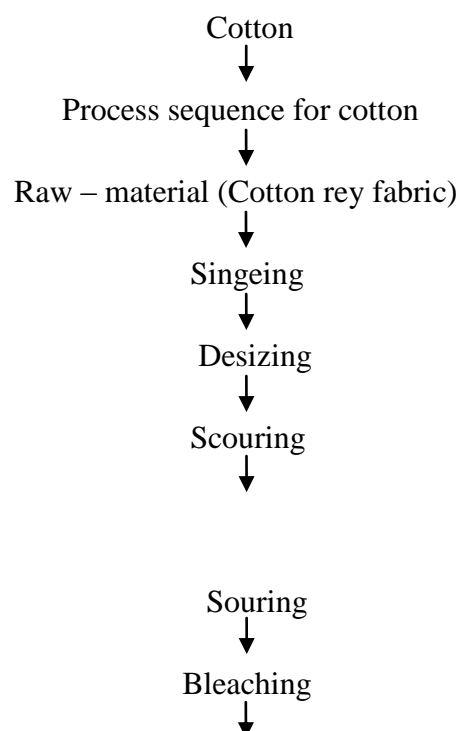
For synthetics the following chemicals are added;

Zirconium type pyridinium compounds

Silicones , Fluro carbons.

Part C

16 .Discuss the need for textile processing?



Mercetising



Dyeing



Printing

After treatment (both chemical & Mechanical Process)

Singing :

Removal of loose hairy fibres protruding (or) projecting from the surface of fabric by burning is called singeing

Object of Singeing:

Singeing is the process of removing the loose hairy fibres projecting from the surface of the fabric by burning. These are done to give a smooth even and clean looking face to the fabric.

Desizing:

Desizing is the process of removal of sizing materials deposited on the fabric during the sizing operations.

Object of Desizing:

The object of desizing is the removal of these impurities and the opening up of the pores of the fibres. This make the fabric soft & more absorbent.

Recipe:

Hydrochloric acid = 0.5-1%

Sodium Chloride = 0.5-1%

Condition:

Time = 1-2 hours

Temp = Room temperature (RT)

pH = 4-4.5

Material to liquor ratio = 1:20

Scouring:

After desizing and through washing the cloth contains oils, fats, waxes, seed bits, leaf particles and natural colouring matters, etc., These oils, fats, waxes are hydrophobic or water hating characters. So, if these compounds present in the cloth, they affect the absorbency of cloth. This leads to improper dyeing, printing and finishing in subsequent process.

Recipe:

Sodium hydroxide = 3%

Soda ash = 2%

Wetting agent = 1%

Condition:

Material to liquor ratio = 1:30

Temp = Boiling temp

Duration = 2-3 hours

Souring:

This process is done to neutralise the fabric. This process is done mostly after every process.

Bleaching :

Bleaching is the process of removal of natural colouring matter (yellowish grey colour) present in the textile material by using NaOCl, CaOCl, H₂O₅, SO₂, etc.,

Recipe:

H₂ O₂ = 4 Volumes

Sodium Silicate = 4.8 gms / lit

Sodium carbonate = 0.5 – 1 gms / lit

Condition:

pH = 10.5 – 10.8

Temp = 85°C – 90°C

Time = 1-2 hrs

Material to liquor ratio = 1:50

Mercerising:

Mercerisation improves the luster of cotton fibres. Also gives the cotton material a greater affinity for coloring matters. Mercerising consists of impregnating the cotton material with cold 25% Caustic soda solution under tension for specified time washing out of caustic soda is done while the cloth is still under tension. Tension during mercerization is essential to improve the lusture. Mercerization produces a permanent change in structure of cotton fibers..

Object:

To improve luster of the fabric

To increase the strength of material

To give good dye absorbing capacity to cotton

To increase hygroscopicity property

Dyeing:

Dyeing is the process of colouring textile materials by immersing them in an aqueous solution of dye, called dye liquor. Normally the dye liquor consists of dye, water and auxiliary.

To improve the effectiveness of dyeing, heat is usually applied to the dye liquor.

A dye stuff is a substance which is capable of colouring a textile materials in such a manner that it associates closely with the fibres.

There are 2 types of colouring matters they are Dyes and pigments. Dyes also is divided into 2, they are Soluble & insoluble dyes.

Eg:- Vat, Sulphur, etc are insoluble dyes.

Reactive dyes are soluble dyes and are widely used for dyeing cotton products because of their wide range of shades availability. Excellent fastness property & moderate dyeing rate (or) cost of dye / kg.

Printing:

It is a process of producing attractive designs on textile fabrics using one or more dye stuffs. Printing is localised dyeing. Printing is nothing but applying colours within boundaries of the designs.

Styles of printing:

Direct style

Discharge style

Resist style

The different styles can be done by using different printing methods like block, screen, flat bed screen, rotary screen, transfer printing, etc.,

After treatment:

After dyeing or printing, fabric is taken to after treatment by means of washing and soaping treatment.

Objective:

To remove the unfixed dye stuff and chemicals from the fabric.

To avoid the bleeding of colours during subsequent washing.

Finishing:

Finishing is one of the essential process of a processing mill. The aim of textile finishing is to render textile goods fit for their end uses.

Objectives:

Improved appearance – Luster, whiteness, etc.,

Improved feel which depends on the handle of the fabric and its softness, suppleness, fullness, etc.,

It improves the wearing qualities – Non soiling, Anticrease.

It gives special properties required for particular uses – water proofing, flame proofing, etc.,

It covers the faults of the original cloth.

It increases the weight of the fabric

It increases the sale value of the material

It improves the serviceability of the fabric

Hence, finishing is essential for a textile good before they are put on the market. There are different types of finish but are applied on the fabric according to its end uses.

17. Write the types of preparatory process?



Singeing:

Singeing and its process of the moving the remove the loose hairy fibres projecting from the surface of the fabric by burning. These are done to give a smooth. Even and clean looking face to the fabric.

The fabric should be singed because.

The fabric to be mercerized must be singed to develop maximum insure in the fabric.

The fabric to be printed must be singed to impart clearly defined and sharp designs on the cloth. So the singeing is considered as impart clearly defined and sharp designs on the cloth.

The main types of singeing are,

1. Hot plate singeing
2. Roller singeing
3. Gas singeing

Hot plate singeing:

It is the process of burning away the protruding or projecting fibres, by passing the fabric in full width form, over the surface of the heated copper plates.

Roller Singeing;

Instead of using heated plates, heated revolving rollers or hollow cylinders are used to burn the protruding or projecting fibres.

Gas singeing:

It is the process of burning of protruding fibres by passing the fabric in between flames of a gas burner. It is more economical, more convenient and more efficient singeing.

Types of yarns to be singed:

1. Combed cotton yarn.
2. sewing threads
3. High twisted voile threads.
4. Polyester cotton blended yarns.
5. Hosiery yarns meant for knitting.

Types of fabric to be singed:

Shirtings , suitings, sarees, dress materials , voils cloths ,poplins, polyester cotton blended fabric.

Gas singeing machine:

Gas singeing is more economical , more convenient and more efficient singeing . It is mostly used in all processing mills in India.

The machine consists of following parts.

- Guide roller
- Drying cylinder
- Brush roller
- Burners
- Water trough
- Drag roller
- Squeeze roller
- Steam chamber

WORKING OF GAS SINGEING MACHINE

GAS SINGEING MACHINE:

Gas singeing is more economical, more convenient and more efficient singeing. It is mostly used in all processing mills in India. The machine of the following parts.

Guide rollers:

The main function of guide rollers is to guide the fabric and also to give tension to the fabric. The guide rollers after the burners are to extinguish any fire sparks present in the fabric.

Dyeing Cylinder:

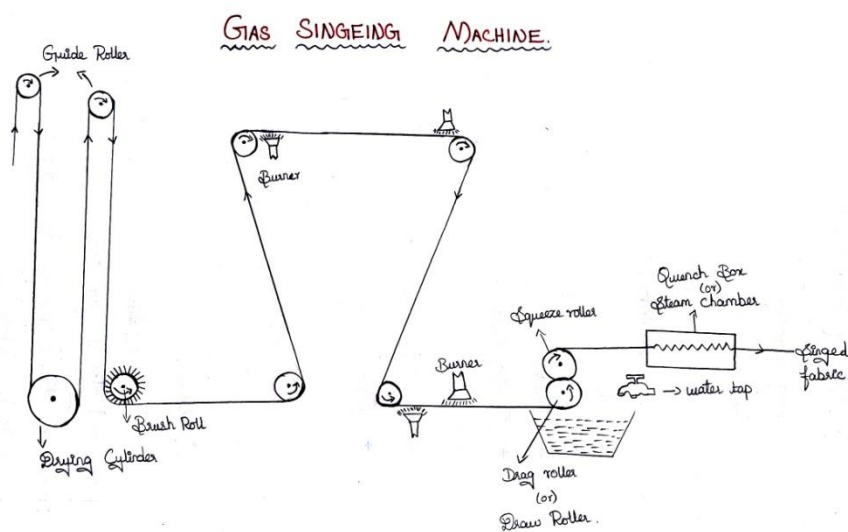
The main function of drying cylinder is to evaporate the moisture present in the fabric. Sometimes more than one cylinder is used in this machine.

Brush Roller:

The main function of the brush roller is to raise the projecting fibres present in the fabric.

Gas Burner's:

The number of burners in a singeing unit may vary from 4 to 6. These burners are arranged in both sides of the fabric which is singed at a single passage. The flame is obtained by burning a mixture of air and coal gas or air and petroleum. The intensity of the flame and its distance from the fabric can be adjusted.



Water trough:

The object of the water trough is to extinguish any fire spark present in the fabric.

Drag Roller:

The function of drag roller is to maintain the speed of the fabric.

Squeeze roller:

The function of the squeeze roller is to squeeze excess amount of water present in the fabric.

Steam chamber (or) Quench box:

This chamber is filled with wet steam under low pressure. The water tap is sometimes replaced by steam chamber. The function is to extinguish any fire span present in fabric.

Procedure :

The fabric from the guide roller is passed under the drying cylinder. It to evoprate the moisture in the fabric with a help of a guide roller, the fabric is coming under the brush roller . It is to raise the projecting fibres from the surface of the fabric and passes over and under the guide roller . During the stage , the fabric is passed in between the burners.

The burners are present as shown in the figure . The function of burners is to projecting fibres and there immediately the cloth is coming to the water trough . This is the extinguish any fire spark in the fabric and then the fabric is passed in between drag and squeeze roller and reaches the steam chamber .The purpose of steam chamber is to extinguish any fire spark without wetting the fabric . Finally we will get singed fabric. the speed of the cloth vary from 180 to 250 yards minute.

Advantages :

Both passage of a fabric can be singed in a single passage.

The production is more because of high speed.

Disadvantage:

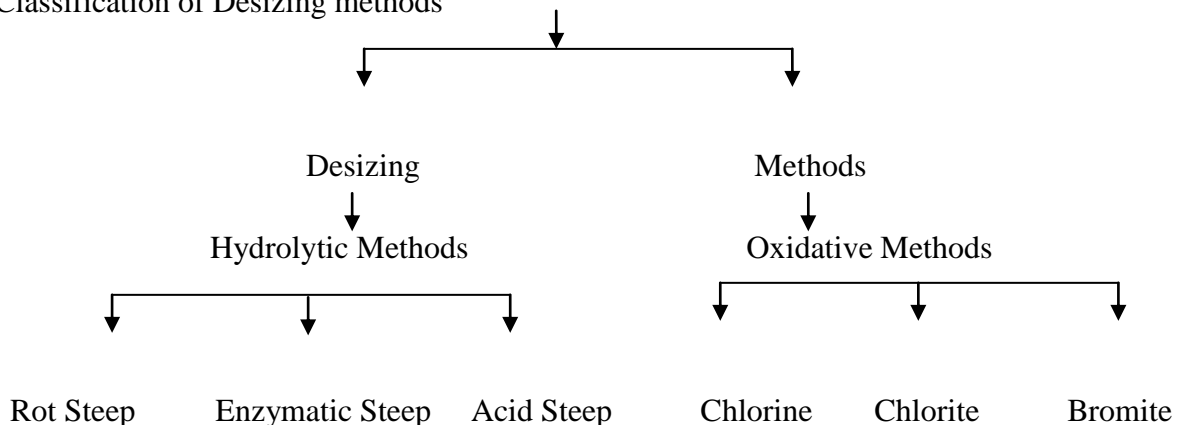
When the flame is not controlled there is a chance of fire bon the cloth.

Desizing process :

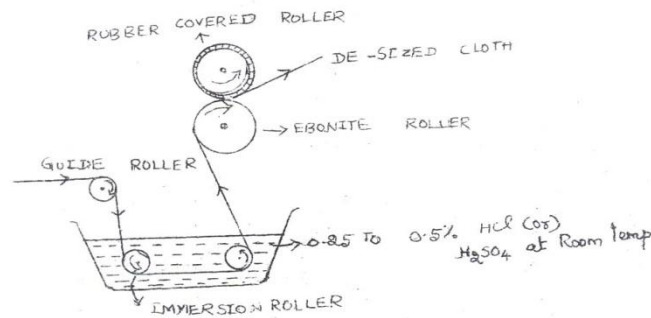
Object

Removal of size from the grey fabric which is applied during weaving. This is done to make the fabric more absorbency.

Classification of Desizing methods



Acid Steep :



Dilute HCL or Dilute H_2SO_4 are used to remove the starch from the fabric . . 0.25 to 0.5% at room temperature is sufficient for this method . the duration of this method . the duration of the time is 8 – 12 hours. The fabric is immersed in this solution by using two bowl mangle and then the cloth is kept from 8-12 hours in closed vessel or plastic covers.

Note :

Time 8 – 12 hours . Temp – Room Temp , PH – Acedic.

The starch is hydrolysed by the action of acid during the storage period. Then the cloth is washed with water to remove the hydrolysed starch . If the temperature will be raised to $50^{\circ}C$, the time will be reduced to 4-6 hours.

Precautions:

The cloth should be stored in a closed wet gunny bag (Jute cloth) or concreat pit to prevent local evaporation. Suppose , if the material exposed to air at that time degradation of cloth willtakes place. At high temperature , the cotton cloth may be degraded in presence of acid..

Advantage :

Desizing is very cheap.

Disadvantage :

Danger of tendering

Prolonged treatment with acid will also degrade the material

Scouring

After desizing and through washing the cloth contains oils, fats, waxes, seed bits, leaf particles, and natural colouring matter etc. These oils, fats, waxes are hydrophobic or water hating characters. So if these compounds present in the cloth, they affect the absorbency of the cloth. These lead to improper dyeing, printing, and printing subsequent process. Scouring is carried out in a boiler called as kiers

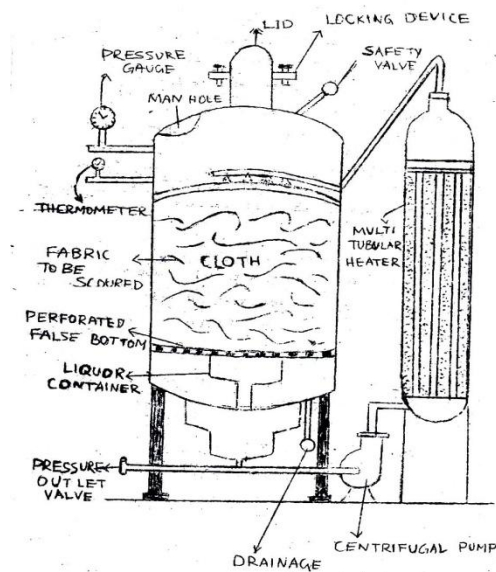
Two types of kiers are.

Horizontal kier

Vertical kier.

Vertical kiers

Scouring process is carried out commonly in vertical kier boilers usually under high pressure 20 – 30 lbs/sq. inch and temperature 120o-130o with 8 to 24 hrs, depend upon the type of fabric.



High pressure, high temperature vertical kier:

The vertical kier as shown in the figure. The kier consists of a cylindrical vessel made up of a cast iron. The inner portion is coated with a lime wash to prevent the formation of rust stains on the fabric.

The desized fabric is placed inside the kier uniformly by manually or mechanically . It is called as packing or pilling Pacing should be done evenly . uneven packing result in uneven scouring.

The top of the kier is provided with cover known as lid. Usually boiling is carried out with 3% NAOH.

A requird amount of sodium hydroxide is dissolved in water. This liquor is filled in liquor is filled in liquor container. From the liquor container. The liquor is pumped with the help of centrifugal pump.

Them the liquor reach the heater, at that time the solution is heated and the heated solution is passed through the sprayer.

The sprayer is placed above the fabric. The heated solution is sprayed on the fabric and then reaches the liquor container with the help of perforated false bottom. This operation is repeated for 8 hours.

After the time is over the pressure is released. The liquor is taken out through drainage.

The cloth is washed with hot and cold washes two or three times and then the cloth is taken out for further process.

Caustic Soda boiling is used for Fine counts, super Fine counts varieties and delicate fabric structured material etc.,

Scouring liqueur is prepared as follows:

NaCh -- 3.0%

Soap -- 0.5%

Wetting agent -- 0.5%

(Turkey Red Oil)

Sodium silicate-- 1.0% (to retain heat stability)

Material to liquor ratic-- 1:4

Temperature -- 120oC to 130oC

Time -- 8 hours

Pressure -- 20 to 30 lbs/sq.inch

Precautions:

1. When the scouring operation is started, remove the air completely inside the kier, changes of formation of oxy cellulose. It will damage the fabric.
2. Packing should be done uniformly. Uneven packing results in uneven scouring.
3. After packing the top portion is covered with heavy stones or thickly variety of fabric to prevent hot liquor directly falling on the fabric.
4. After scouring is over, washing is also done inside the kier, otherwise oxy cellulose will degrade the cotton material.

Bleaching :

Bleaching is the process by which the natural yellowish grey colouring matter left in the cotton material, after scouring is completely removed.

There are two types of bleaching agent. They are

1. Reducing bleaching agent
2. Oxidizing bleaching agent.

Reducing bleaching agent :

This is a process in which the bleaching action takes place due to the action of liberated nascent hydrogen. For an example when sulphur dioxide gas dissolves in water liberates nascent hydrogen from water.

Thus produced nascent hydrogen combines with the scouring matter and from the addition compounds or the colouring matter is decomposed the simple colouring compounds.

Important reducing bleaching agent sulphur dioxide, sulphurous acid, sulphides, bisulphides and hydro sulphides.

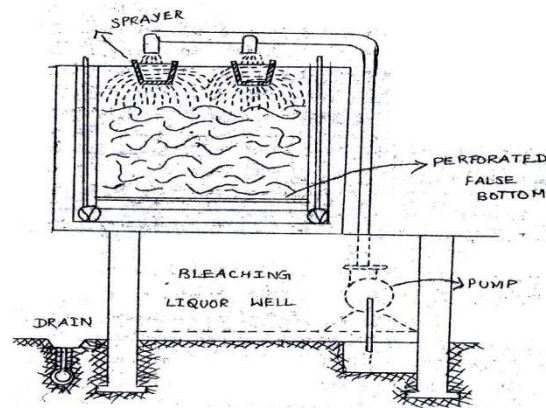
Oxidizing bleaching agent:

This is the process in which the bleaching action takes place, due to the action of liberated oxygen.

Here the bleaching action takes place by oxidation and breaking up of natural colouring matter into simple colourless compound which can be thoroughly washed away from the material.

Chlorine , hypochlorites of sodium and calcium peroxides , penborates , potassium permanganate , potassium di chromate and ozone.

Liquor circulating method



Most common method used for bleaching is bleaching is cistern method . In this cistern , bleaching is done by liquor circulation method .the good are packed in cistern , bleaching is done by liquor circulation method .The goods are packed in cistern over the perforated false bottom and already prepared bleaching liquor is filled up in the liquor container.

Centrifugal pump is operated , solution is passed through the centrifugal pump and reach the sprayer .The solution is sprayed on the fabric and slowly percolates through the material and again reach the liquor container by the help of false button . the operation is repeated 3 to 12 hours depending upon the quality of fabric concentration of solution and degree of whiteness required .

When the bleaching has been completed the material is washed with cold water .

The cistern may be made of stone or cemented brick . The capacity of cistern made of stone of cemented brick . The capacity of the cistern is 2 tons . The cloths are arranged in Rope form.

Souring:

Calcium carbonate is formed during bleaching with bleaching with bleaching powder (calcium Hypo chloride and this is deposited on the cloth . The calcium carbonate cannot removed by washing because the calcium carbonate if present in the cloth may give harsh feel the fabric .

So the material should be soured with dilute HCL of 0.5% to 1.0% strength and it is allowed for 30 to 60 minutes . The calcium carbonate³ is converted into calcium chloride and then the material is washed . Now the calcium chlorite is completely removed.

Mercerising:

Mercerisation improves the luster of cotton fibres. Also gives the cotton material a greater affinity for coloring matters. Mercersing consists of impregnating the cotton material with cold 25% Caustic soda solution under tension for specified time washing out of caustic soda is done while the cloth is still under tension . tension during mercerization is essential to improve the lusture . Mercerization produces a permanent change in structure of cotton fibers.

Microscopic examination shows that the cross-section of cotton fiber change from circular form due to mercerization . convolutions of cotton fibres are removed on mercerization . under the microscope , the mercerized cotton fibre will look like a cylindrical tube . Mercerisation infreases the reactivity and absorbancy of cotton fibres for absorbing chemical dyes water, they improves the stencil strength.

Mercerising of fabric :

The machin available for cloth mercerizing are ;

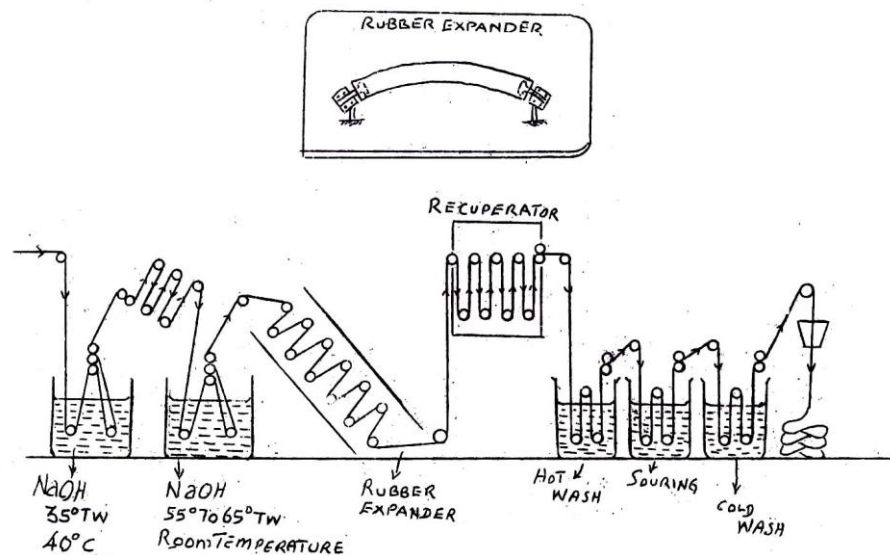
- a. Chain mercerizing machine
- b. Chainless mercerizing Machine
- c. Chainless padless mercerizing

Chainless mercerizing machine :

This machine is also consists of ,

1. The impregnating machinery .
2. The stretching and washing machinery .
3. The recuperator and
4. Neutralising and washing machinery .

Except the stretching process , functions and conditions are as same as the chain mercerizing machin.



Impregnation :

The machine consists of padding mangles. First padding contain NaOH 35° Tw strength and 40o c tempreture . First , the cloth is impregnated in this solution and passes over and under the guide rollers and again reach the second padding mangle contains NaOH 55o c 65oC TW at room temperature . the time of reaction with alkali may vary from 1 to 1.5 minutes depending upon the speed of the machine . From the second padding mangle , fabric reach the stender unit .

Stender and washing machinery :

The arrangement consists of 12 stendering roller . These are curved rollers which are inclined in nature . washing is takes place on the counter current system. There is no washing on the first 6 rollers and then washing takes place . the action of expansion depends upon warp tension Hero ,10to 12 rollers do the function of stendering the cloth by applying their tension on the warp side expanders do the function of stretching in weft way direction.

Recuperators :

Their function is to remove any NaOH present in the fabric by the use of steam . This consists of an air tight chamber in which steam is admitted. The cloth passed through this chamber, dissolved the alkali and then the condensed liquor is collected at the feed end by using fresh water at the delivery side .

Neutralising and Washing Machinery :

In the last stage the cloth will give hot wash and souring treatment by using dilute HCL (or) H_2SO_4 and then given cold wash . Now the cloth is neutral and then taken for further process

Advantages:

Floor space will be very less compare to chain mercerizing.

1. Light weight fabric can be mercerized easily without and tension.
2. There is to difficulty in mercerizing cloth of different width (or) any width of the fabric is mercerized very easily .

18. Explain the stages of dyeing.

THE GENERAL THEORY OF DYEING:

Dyeing is the process of colouring textile materials by immersing them in an aqueous solution of dye, called dye liquor, Normally the dye liquor consists of dye, water and auxiliary. To improve the effectiveness of dyeing, heat is usually applied to the dye liquor.

The general theory to dyeing explains the interaction between dye, fibre, water and dye auxiliary. More specifically, it explains:

1. Forces of repulsion which are developed between the dye molecules and water; and
2. Forces of attraction which are developed between the dye molecules and fibres.

These forces are responsible for the dye molecules leaving the aqueous dye liquor and entering and attaching themselves to the polymers of the fibres.

THE DYE MOLECULE:

DYE MOLECULES ARE ORGANIC MOLECULES WHICH CAN BE CLASSIFIED AS:

1. Anionic – in which the colour is caused by the anionic part of the dye molecule:
2. cationic – in which the colour is caused by the cationic part of the dye molecule:
3. Disperse – in which the colour is caused by the whole molecule. The first dye molecule types are applied from an aqueous solution. The third is applied from an aqueous dispersion.

A dye stuff is a substance which is capable of colouring a textile materials in such a manner that it associates closely with the fibre. i.e., that is not removable by simple physical means (e.g. rubbing or mild deterging). It must be soluble in water, or capable of going into solution

by chemical means, whereby a highly dispers condition may be regarded as a form of solution.

Fastness – Properties of Dyes

Common properties required of a dye:

1. when a dye is present on a fabric, it is expected to have certain properties. When a dyed (or) printed fabric is exposed to sunlight during its use, the dye should not fade or change in colour. That is it should have high light fastness.
2. The dye should possess good washing fastness. If the cloth dyed with it is used for making garments. Otherwise staining of garments with stripped dyestuffs occurs during the washing of many garment together.
3. The dye should have good perspiration fastness when people wearing coloured garments perspire, a part of the dye coming into contact with the perspiration may be stripped and stain the skin of the water.
4. Apart from these properties the dyes can be expected to have good fastness to gas fading incites gases like sulphur dioxide, nitrogen dioxide, may be present in the atmosphere and the dye may be affected. Dye polyesters and polyamide fabrics are exposed to very high temperatures during processing in textile mills.

ACID DYES:

Acid dyes are usually sodium salts of sulphonic acids and a few of them are sodium salts of carboxylic group. These dyes are normally dyed from an acid dye liquor and there are known as acid dyes. These dyes are mainly used for protein and polyamide fibres. Acid possess direct affinity for wool, silk, nylon, regenerated and protein fibres. These dyes are not readily soluble in water.

BASIC DYES:

These are soluble in water with little addition of acetic acid. They have direct affinity for wool and silk but not for cotton. These dyes produce most brilliant shade. But they have poor light fastness.

REACTIVE DYES:

These are latest soluble synthetic dyestuffs. These dyes establish a chemical linkage with hydroxyl group of the cellulosic fibre and amino group of protein fibres. Due to the permanent linkage between the fibre molecule and dye molecule the dye give shades of excellent fastness. Their application to cotton involves two stages.

1. Dyeing with reactive dye.

2. Fixing the dye with the fibre in the presence of alkali like Sodium Carbonate.

There are two types of dyestuffs. They are,

1. Hot brand dyes (H)
2. Cold brand dyes (M)

WATER INSOLUBLE DYES

VAT DYES:

These dyestuffs are not soluble in water. It can be converted into soluble leuco compounds by the action of reducing agent such as Sodium Hydrosulphite. Cellulose has affinity for the leuco compound. After the leuco compound is absorbed by the fibre, they are oxidized to the original insoluble form.

SULPHUR DYES:

Sulphur dyes are insoluble in water. It is to be converted into soluble leuco compounds by the action of reducing agent such as sodium sulphide. The reduced form of the sulphur dyes absorbed by the fibre has to be reconverted in to the original form of the dye. This is carried out by oxidation treatment. The fastness to washing and light is very good.

DISPERSE DYES:

The disperse dyes are finely divided insoluble organic colour pigments. They are more soluble at higher temperature. These dyes are mainly applied to Hydrophobic fibres such as, polyester, nylon etc., these are capable of giving faster and deeper shades.

AZOIC COLOURS:

These are not readymade dyes but the dye (or) printer has to make it in the fibre. They are supplied as bapthols and bases. These dyes are mostly used for dyeing cellulosing materials. The dyeing of Azoic colour involves.

1. Naphtholisation (Dyeing in the naphthol)
2. Dizotisation – Napholated material is treated wit Duzonium Salts.

REACTIVE DYES

The reactive dye originally reacts and forms covalent bond with the fibre and hence they are called as 'Reactive dyes'. Because of the strong covalent bond with the fibre, it has good fastness properties.

Properties

1. It is water soluble. It dissolves, ionizes in water and forms negative charged dye ion
2. The reactive dyes are account of the sulphonic acid groups in their Molecule are readily soluble in water
3. wide range of colors are available.
4. Hence, they have good fastness as mentioned below

Wash fastness - 4-5

Rubbin fastness - 4-5

Light fastness - 5-6

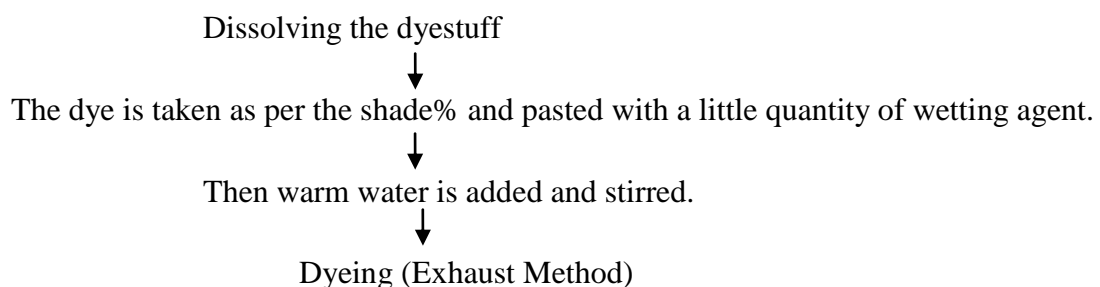
5. The general structure of reactive dyes is

Dye group ----- Bridging group----- Reactive group.

Classification of reactive dyes :

1. Hot brand dyes – mono chloro tri azine dyes . These dyes have only one cl- group as the reactive group which needs higher temperature to be available for reaction with fibre . Hence they are called as HOT brand dyes .
2. Cold brand dyes – Di chloro Tri azine dyes . These dyes have two CL – groups and hence they react with fiber even at room temperature . so they are called as cold brand reactive dyes.
3. Vinyl sulphone dyes – Ramzol dyes.
4. Drimarine dyes – Ex....Levafix dyes
5. High Exhaustion dyes – HE dyes
6. Bi-functional dyes – ME dyes., FN dyes etc.,

Dyeing of cotton with reactive cold brand dyes



The dyeing procedure in winch dyeing machine is explained below. The fabric is loaded in the machine. The water is filled as per M:L ratio (1:20). The circulation of material is started.

5 min

Dye solution is added

5 min

½ of 30-50 gpl Sodium Chloride (Common salt) or 20-30 gpl Sodium Sulphate (Glabour salt) is added as Exhausting agent It exhausts the dissolved dye from the solution and transfers the same to the same to the substrate. (Refer mechanism of dyeing)

15 min

Remaining salt is added and the dyeing is continued.

45 min

10-20 gpl Sodium carbonate is added as fixing agent. This alkali enables the dye to form covalent bond with the fibre.

30min – 60 min depending on shade

Hot wash at 50oC for 15 min

Cold washing 1% Acetic acid for 15 min

Hot soaping in 5 gpl soap and 1 gpl soda ash at 50oC for 15 min

Cold – washing for 15 min

19.Explain briefly about tie and dye and batik style of printing ?

Tie and dyeing :

The result of dyeing are sometimes similar in the appearance to batik, but the design are made differently. The dye is resisted by knots that are tied in the cloth before it is immersed in the dye bath. The outside of the knotted portion is dyed, but the inside is not penetration if the knot is firmly tied partial penetration occurs when the knot is not tight causing gradations and irregularities of colour that produce indistinct but attractive designs. The process is repeated as many times as desired by making new knots in other parts of the cloth and immersing the fabric in additional dye baths. This gives a characteristic blurred or mottled effect, the result of the dyes running into each other. Like other hand methods, tie dyeing is expensive. Because the method creates interesting designs, the patterns are imitated in the roller printing.

Ikat Dyeing:

An ancient method of fabric coloration by tie-dyeing bundles of warp and / or weft yarns prior to weaving is ikat. It is believed to have originated in the orient. In Japan it is called kasuri. The major centers today are Bali, Java and Sumatra.

Ikat is a skilled art form. The colours usually Indigo, red and brown, are placed along the length of the yarns in anticipation of the design that is to be woven. When the fabric is woven, the edges of the design have a blurred or shimmering effect not unlike a reflection on water. This is due to the slight penetration of the dye that may occur beyond the tie and to the stretching of the yarns on the loom during weaving.

Plangi Dyeing:

Plangi is another ancient art form of dyeing. The major centres today are in Africa. It is a form of tie-dyeing by gathering, folding or rolling the fabric, usually held with stitching to form specific pattern.

Batik printing

Batik printing is a process for production of printed patterns by a peculiar kind of resist work or resist style. The special feature of Batik printing is that fine lines of colour can be seen running irregularly across the resisted parts of the pattern in the fabric. This artistic effect is brought about by wax which is used as a resist. When portions of cloth which are to remain undyed are resisted by applying molten wax and when the wax has hardened, the cloth is dyed with dyestuffs dyeable in cold (below 40°C) during the handling of the cloth in the dyeing process the wax being brittle cracks and the dyeliquor penetrates through these "cracks" of wax and becomes fixed on cloth, thus causing the curious veined or marbled-like lines on it. Sometimes, a fine network of two or three different colours is seen over the white portion beautiful appearance. Batik printing which has been practiced in Java from olden times has attained a high degree of perfection and has been developed there into a mighty industry. The word Batik is derived from the Javanese word "ambatik" which envisages the whole operation.

In the actual process a mixture of one part of bees wax and 4 parts of paraffin wax is taken and melted it is kept in molten state over a low flame (if it becomes too hot, it starts giving out vapours and when applied on cloth it does not give good cracks). The melted wax is poured over those portions of the cloth which are to be resisted i.e. are required to remain undyed. If it is desired to have a pronounced "cracking" effect, then the proportion of paraffin wax in the mixture, the more brittle the print. Various instruments are used for applying wax to the cloth: the simplest ones consist of a pointed stick,

bamboo spoons and bamboo squills of various sizes. A small pen of copper fixed in to a bamboo handle is also used. An iron pencil fixed with a bamboo handle round which a wad of human hair or strips of cloth is wrapped is used which serves as a kind of wax pot, the melted wax is absorbed by the wad from which flows slowly towards the end point of the pen. The "T jap" and the T janting are two elaborate instruments used in Java. The "T jab" is a metallic block. T jap printing is, therefore, block printing with wax. It saves a considerable amount of time. T janting with 2 to 5 or even 7 spouts are used for drawing a number of dots and lines at equal distance. A "T janting" with a very slender spout is used for forming a wax stroke of 0.1 cm width. Batik is traditionally done on cotton or silk.

The wax printed goods are often allowed to hang for a few days during which time the wax hardens and becomes more brittle. If the hardening or setting of the wax is not complete, the final "cracking" effect which is the hallmark of first rate Batik work, will be lacking. When the wax has set, the goods are dyed in cold by a colouring matter which can be applied at the temperature low enough to prevent the melting wax and confine the dye to the unwaxed portions. Further waxing and re-dyeing is usually carried out to build up a variety of shades, for increasing the depth as well as for superimposition of colours. The wax is afterwards removed by treating and dyed material in boiling water and then with water containing soda ash and washed and dried.

20. Explain the mechanism of textile finishes like glazing, schreinerizing and beetling on fabrics?

FINISHING

Finishing is one of the essential processes of a processing mill where all bleached, dyed and printed material are subjected before they are put on the market.

The aim of the textile finishing is to render textile goods fit for their end uses.

Finishing gives the following advantages:

1. Improved appearance – Lustre, Whiteness etc.,
2. Improved Feel which depends on the handle of the fabric and its Softness, Suppleness, Fullness etc.,
3. It improves the wearing qualities – Non soiling, Anticrease.
4. It gives special properties required for particular uses – Water proofing, Flame proofing etc.,
5. It covers the faults of the original cloth.
6. It increases the weight of the fabric.

7. It improves the sale value of the material.
8. It improves the natural attractiveness of the fabric.
9. It improves the serviceability of the fabric.

Hence, Finishing is essential for a textile good before they are put on the market.

TYPES OF FINISH

Finishing mainly falls into three groups;

1. Temporary Finish
2. Permanent Finish
3. Semi – Permanent Finish.

TEMPORARY FINISH

A finish which is not stable and goes off after the first wash is known as TEMPORARY FINISH.

If the finishing effect in the fabric disappears during subsequent washing and usage then it is called TEMPORARY FINISH.

Eg., Mechanical: Calendaring, Embossing etc.,

Chemical: Starching, Softening (Except Reactive softeners)

PERMANENT FINISH

If the finishing effect in the fabric does not appear and remains unaffected through all the conditions of wear and washing treatments, then the finish is said to be a PERMANENT FINISH.

Eg., Mechanical : Sanforising, Mechanical milling of Wool etc.,

Chemical: Resin Finishing, Water proof, Flame proof finish etc.

Glazing

A stiff polished or glazed surface can be obtained by the application of starch, glue, mucilage, or shellac followed by friction calendaring. The process makes a fabric resistant to dust and spots and minimizes shrinkage. This finish is found principally on chintz. Vita-Glaze is a typical trademark.

Schreinerizing

Schreinerizing is an inexpensive method for imparting luster to low – priced cottons. Steel rollers, finely engraved with lines and exerting a pressure of 4500 pounds (31,000kPa), impress on the fabric diagonal ridges ranging from 125 to 600 to the inch (50 – 235/cm). Reflection of light from these ridges gives the fabric a lustrous effect somewhat similar to that produced by mercerization. But the luster produced by Schreinerizing is not permanent, because the imprinted ridges disappear with repeated launderings. This finish is suitable, however, for lingerie fabrics and for linings and sateens, as the slightly rough surface produced by the diagonal ridges reduces the tendency of fabrics to cling. If the fabric has been mercerized, the additional Schreinerizing produces a luster simulating that of silk.

Beetling

Beetling is a common finishing process for linen. The yarns are flattened by the impact of wooden mallets (see Figure 9-9). This hammering actually closes the weave and gives the cloth a firm, flattened, lustrous appearance. All table linen is put through this process, but dress linens are never beetled.

Beetling differs from calendaring. The smoothness and gloss obtained by the calendaring process are the result of horizontal pressing and are not permanent; in beetling, the action which is performed is a vertical impact that permanently flattens the yarns.

Cotton fabrics can be made to simulate linen by beetling, as the process gives cotton the firm feel and lustrous appearance of linen.