



TRINITY COLLEGE FOR WOMEN NAMAKKAL

DEPARTMENT OF COSTUME DESIGN & FASHION

**WET PROCESSING
EVEN SEMESTER**

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INTRODUCTION TO TEXTILE PROCESSING

- The pretreatment processes performed in conventional textile industry are **sizing, desizing, scouring, bleaching, mercerization, washing, and heat setting**. One or more of any of these processes are required for the textile substrate depending upon the end use of the textile.



4 STAGES IN TEXTILE MANUFACTURING PROCESS

- STEP1: Spinning.
- STEP 2: Weaving.
- STEP 3: Dyeing + Printing + Finishing.
- STEP 4: Garments Manufacturing.



Textile wet processing

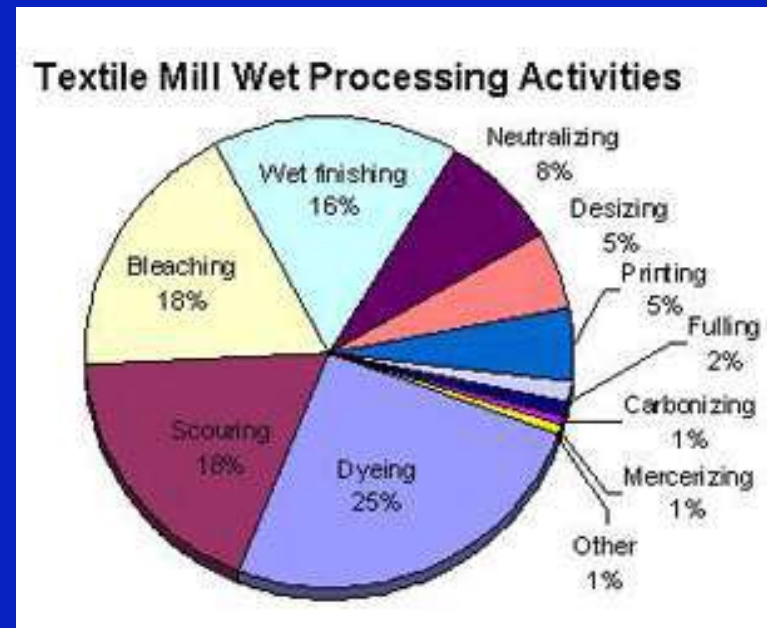
- Textile wet processing, which includes **scouring, bleaching, coloration, and finishing in an aqueous medium**, is of crucial importance for improving the performance and serviceability of textile materials. A massive amount of water, energy, and chemicals are required in the wet processing of textiles.
- This includes sizing, desizing, pre-treatment, dyeing, printing (including digital printing), finishing, laundry, etc.



Sequence of pre-treatment process

The Pre-treatment process of woven fabric follows the following steps:

- Singeing and Desizing
- Scouring and Bleaching
- Mercerizing
- Washing

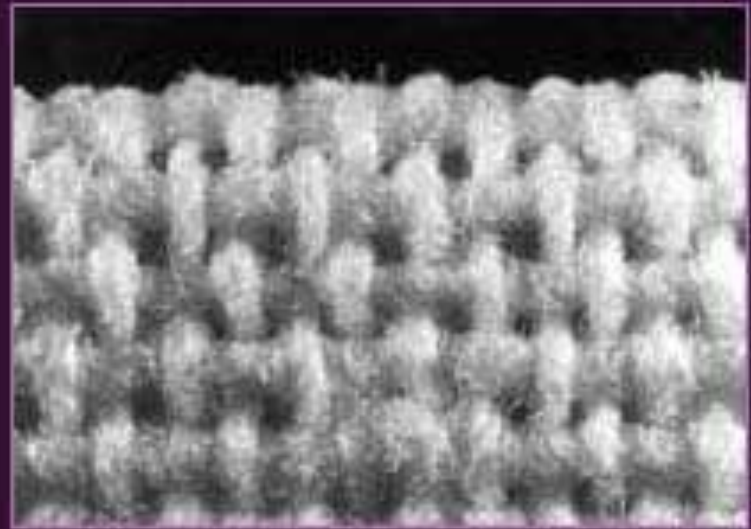


singeing

- Singeing is done to remove the protruding fibres from the fabrics and to make the fabric smoother.



Before Singeing



After Singeing

DESIZING

- Desizing is done to remove the size materials that applied on weaving to improve weave ability. Here enzyme is used as desizing agent.

Different methods of desizing are:

- Enzymatic desizing.
- Oxidative desizing.
- Acid steeping.
- Rot steeping (use of bacteria).
- Desizing with hot caustic soda treatment.
- Hot washing with detergents.



OBJECTIVES OF DESIZING

- To remove the starch material from the fabric.
- To increase the absorbency power of the fabric.
- To increase the affinity of the fabric to the dry chemicals.
- To make the fabric suitable for the next process.
- To increase the luster of the fabric increase of dyeing and printing.

SIZING MATERIALS :

- **Starch:** Corn,
Potato,
Sago,
CMC (Carbon Methyl Cellulose),
CMS (Carbon Methyl Starch).
- **Natural gums:** Locust bean,
Tragacanth .
- **Synthetic sizes:** PVA,
PAN,
PVAC, etc.

ACID DESIZING

- Dilute sulphuric acid or hydrochloric acid may be used to hydrolyse the starch from the sized fabric.
- A 0.25% - 0.5 % solution of the acid at room temperature (30o C) is suitable for this process.
- The cloth is impregnated with the dilute acid solution in a two-bowl or three- bowl padding mangle and then stored for 8-12 hours in a closed concrete pit.

Advantages of acid desizing

- Acid desizing is an economical process.
- The process is effective and gives fairly uniform desizing, as it is a chemical- based process. It does not require specific conditions of pH and can be done at room temperature.
- It is a much quicker process than rot steep desizing.

Disadvantage of acid desizing

- The main disadvantage of the process is that mineral acid is harmful to cellulose fibres if proper care is not taken.
- Especially during the storage stage, the acid-wet fabric must not be allowed to dry.
- This would cause the formation of hydrocellulose, which will weaken the fibre.

Enzymatic Desizing

- Enzymatic desizing is the most widely used method for the removal of starch, amylases being particularly suitable. The advantage in the use of enzymes is that starches are decomposed without damaging cellulose fibre.

Classification of Enzyme :

- Mainly two types of enzymes. Such as:
- **Animal enzymes:** Example: Vival, Novofermosol, Degomma, Waste pancreas, Clotted blood, Liver, etc.
- **Vegetable enzymes**

Preparation of the desizing mixture: Agents should be added:

- Water
- Wetting agent
- Salt
- Acid/Alkali
- Enzyme.



scouring

- Scouring is the process by which natural (oil,gum, wax,fat,etc.,) as well as added impurities washed out completely as possible.

Types of scouring

- Continuous process
- Discontinuous process(kier boiling, jigger,winch dyeing machine)



OBJECTIVES OF SCOURING

- To remove the impurities from the textile materials
- The textile materials are leave in a highly absorptive condition without undergoing any chemical or physical damaged significantly
- After scouring process materials become suitable for next bleaching process

BLEACHING

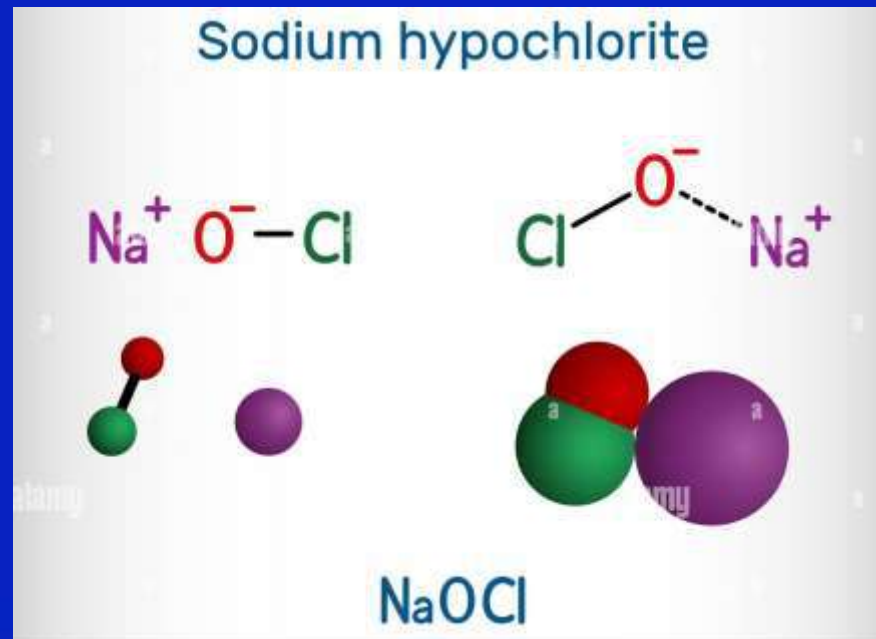
- Bleaching is the process of decolourization of raw material by removing inherent and or acquired colouring components from the fiber. It provides base material which could be further whitened with the help of optical brighteners or dyed or printed depending on the end use



Types of bleaching

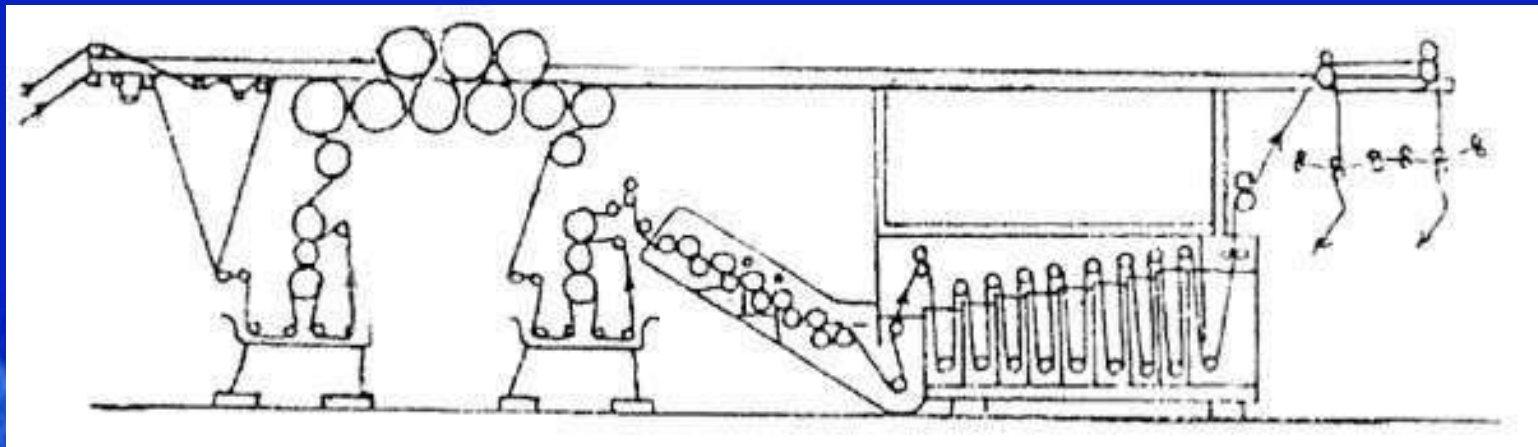
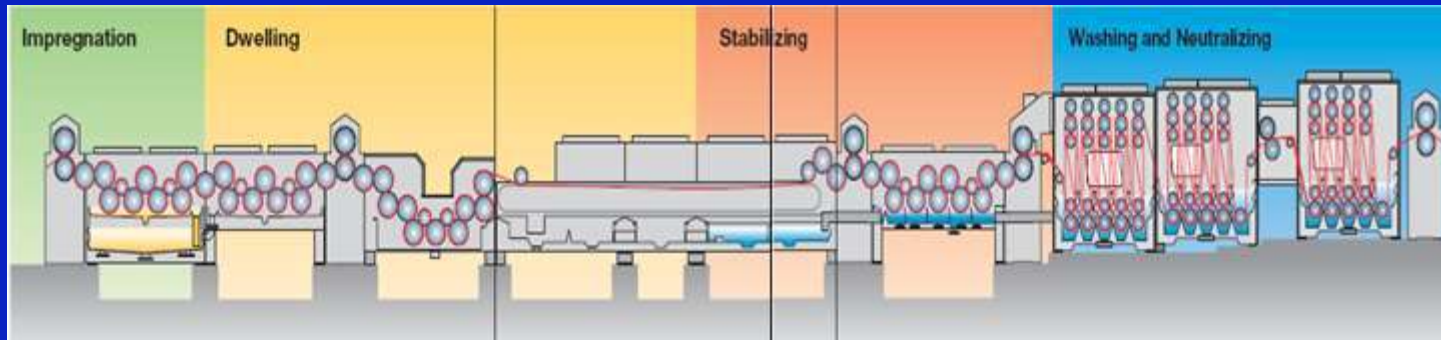
- Basically, two type of chemical processes are employed - oxidative and reductive, and are employed depending on the substrate to be bleached and the nature of inherent coloring impurities.
- An oxidative bleach works by breaking the chemical bonds that make up the chromophore and changes the molecule into a different substance that does not absorb visible light
- A reductive bleaching works by converting double bonds in the chromophore into single bonds by the addition of one mole of hydrogen which eliminates its ability to absorb visible light

- Sodium Hypochlorite on its own is the powder substance used to create liquid bleach, and bleach is a **liquid disinfectant and whitening agent made by combining sodium hypochlorite with water**. Oftentimes, sodium hypochlorite is just referred to as bleach, as liquid bleach is the most common use of sodium hypochlorite.



MERCERIZATION

- **mercerization**, in textiles, a chemical treatment applied to cotton fibres or fabrics to permanently impart a greater affinity for dyes and various chemical finishes. Mercerizing also gives cotton cloth increased tensile strength, greater absorptive properties, and, usually, a high degree of lustre, depending on the method used.
- The treatment consists of immersing the yarn or fibre in a solution of sodium hydroxide (caustic soda) for short periods of time, usually less than four minutes. The material is then treated with water or acid to neutralize the sodium hydroxide. If the material is held under tension during this stage, it is kept from shrinking appreciably; if no tension is applied, the material may shrink by as much as one-fourth. Higher-quality cotton goods are usually mercerized; cloths so treated take brighter, longer-lasting colours from less [dye](#).



Thank You!