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1. BASIC TEXTILE WET PROCESSING TERMS

ABSORBENCY: The ability of one material to take up another material.

BLEACHING: It is a process to remove the natural and artificial impurities in fabrics to obtain clear white for finished fabric or in preparation for dyeing and finishing.

DEFECTS: A general term that refers to some flaw in a textile product that detracts from either performance or appearance properties.

DIMENSIONAL STABILITY: The ability of textile material to maintain or return to its original geometric configuration.

DYEING: It is a process of coloring fibers, yarns, or fabrics with either natural or synthetic dyes.

DYES: Substances that add color to textiles.
EFFLUENT: Waste water released after pretreatment, dyeing & finishing of Textile.

FINISHING: It includes various operations such as heat-setting, napping, embossing, pressing, calendaring, and the application of chemicals that change the character of the fabric.

HEAT-SETTING: The process of improving dimensional stability with high temperature.

LUSTER: The quality of shining with reflected light on textile material.

MIGRATION: Movement of dye from one area of dyed fabric to another.

pH: Value indicating the acidity or alkalinity of a material.

PIGMENT: An insoluble, finely divided substance, used to color fibers, yarns, or fabrics.

SCOURING: Any treatment of textile materials in dilute acid. Its purpose is the neutralization of any alkali that is present in the material

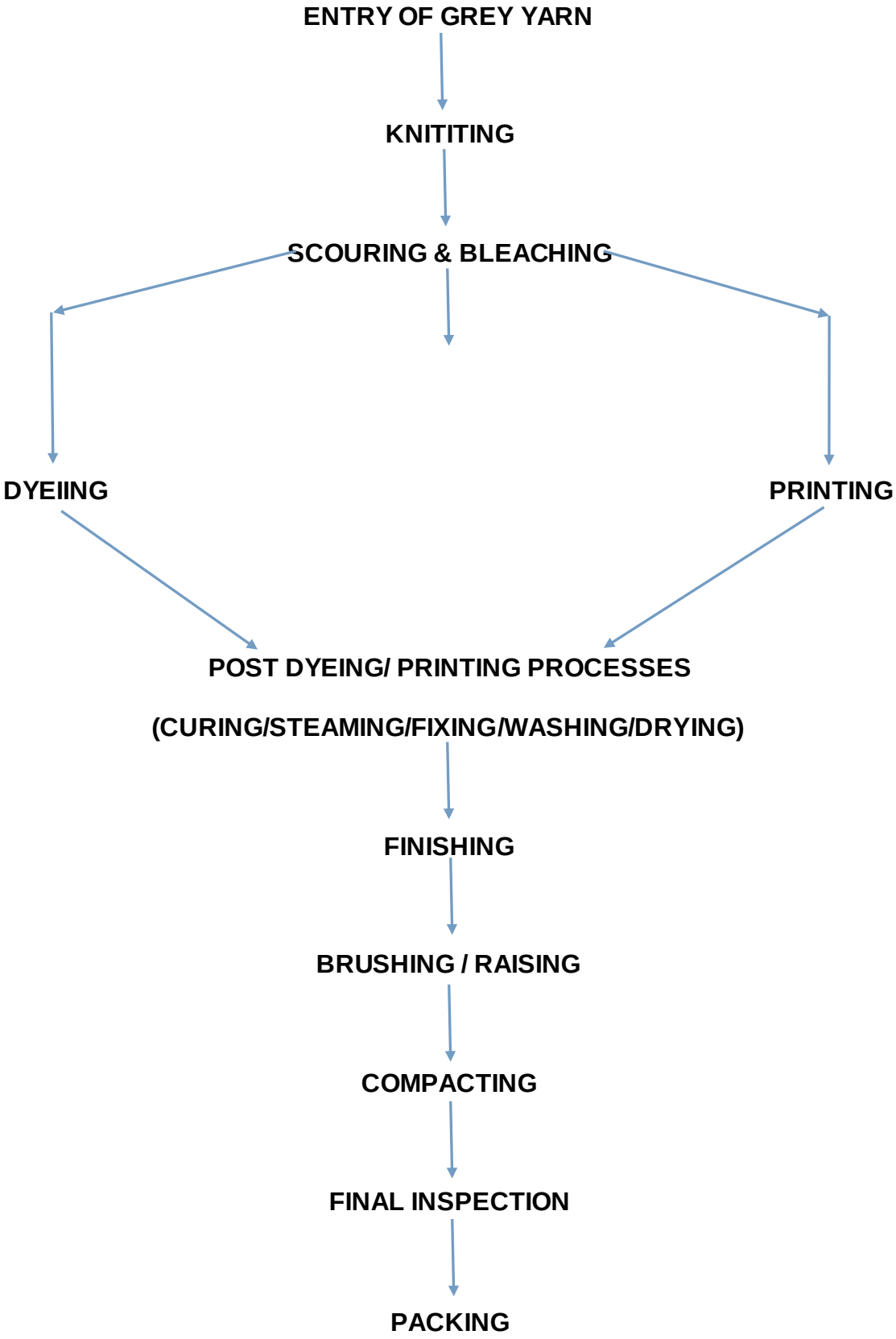
SHRINKAGE: Widthwise or lengthwise contraction of a fiber, yarn, or fabric, usually after wetting a re-drying or on exposure to elevated temperature.

SOFTENER: A product designed to impart soft mellowness to the fabric.

YARN: A generic term for a continuous strand of textile fibers, filaments, or material in a form suitable for knitting, weaving, or otherwise intertwining to form a textile fabric.
YARN COUNT: Yarn count is the numerical expression of yarn, which defines its fineness or coarseness. (Linear density).

WIDTH: A horizontal measurement of a material. In woven fabric, it is the distance from selvage to selvage, and in flat-knit fabric, the distance from edge to edge.

2. SEQUENCE OF OPERATIONS IN WET PROCESSING (KNITTED GOODS)



3. BRIEF NOTE ABOUT SOFT FLOW DYEING MACHINE:

Batch dyeing process:

The dyeing of textile materials is carried out in various forms such as loose stock, yarn, (in the form of hank cheese, cone, warp, etc) cloth (woven and knitted) and garments. Dyeing of knitted goods is carried out in soft flow dyeing machine in rope form. And this is called as "**Batch dyeing technique"**.

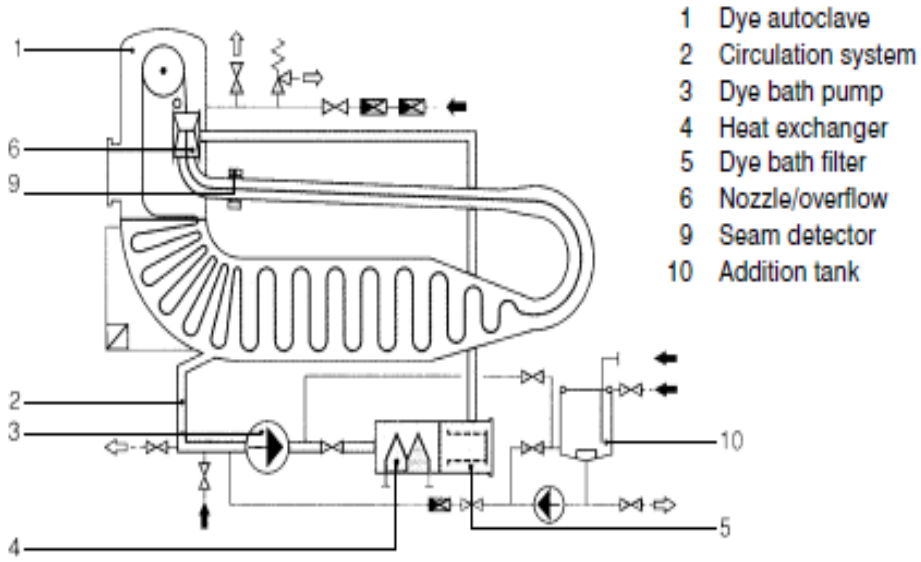
Principles of batch dyeing technique:

Batch processes are the most common method used to dye textile materials. There are three general types of batch dyeing machines:

1. In which fabric is circulated
2. In which dye bath is circulated
3. In which both the bath and material is circulated.

Soft flow dyeing machine:

A soft flow dyeing machine is suitable for dyeing a wide range of knitted and woven constructions of fabric in rope form. Both light and heavy fabric can be processed easily with any fabric distortion by necessary arrangement. The fabric is processed very gently without tension and slippage



Soft flow dyeing machine diagram

Types of Soft Flow Dyeing Machine:

1. Multi Nozzle Soft Flow Dyeing Machine.
2. High Temperature High Pressure Soft Flow Dyeing Machine.
3. Simple soft flow dyeing machine.

Various processes involved in soft flow machine:

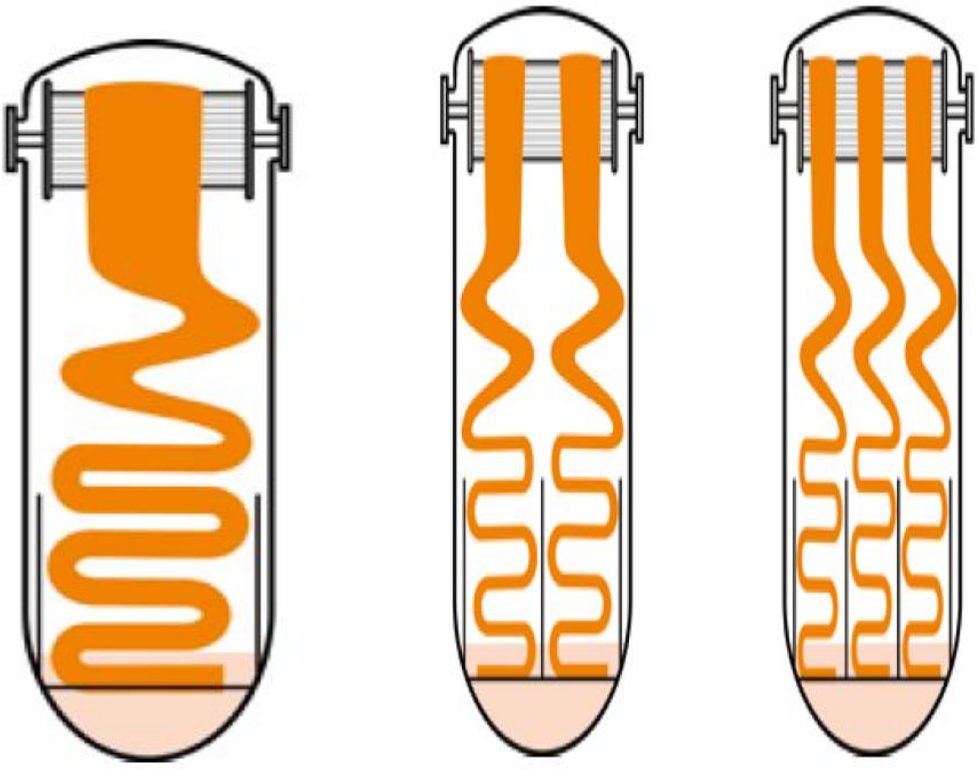
1. Scouring and bleaching
2. Dyeing
3. Washing and Neutralizing
4. Stripping of dyed goods

4. Details of soft flow dyeing machine:

- Machine body and major parts wetted by dyeing liquid are made of corrosion resistant stainless steel. Inside of which fabric is loaded in rope form and all the processes are carried out.
- Installed with highly efficient stainless steel centrifugal pump for circulating the dyes and other chemical inside the machine.
- Pneumatic valves are provided for fill, drain and overflow rinse function and Internal spray cleaning device.
- Highly efficient tubular heat exchanger for exchanging heat energy
- Pneumatic control valves are used for heating and cooling inside chamber with temperature control function.

View of the soft flow dyeing machine

Different types of forming rope in soft flow dyeing machine



Important Parts of Soft Flow dyeing machine

- ❖ Pressurizing and de pressurizing system for main vessel for maintaining the pressure inside the chamber.
- ❖ Level indicator with level sensor for checking the level of the dyes and other chemical.
- ❖ Service tank with feed pump, valves, stirring function and dosing control with high precision flow control device
- ❖ Take off roller.

1 Service tank with feed pump, valves and stirring funtion

2 Heat exchanger and replaceable filter insert

3 Multi-Function Stock Tank (MST)

4 Modulating control for dosing

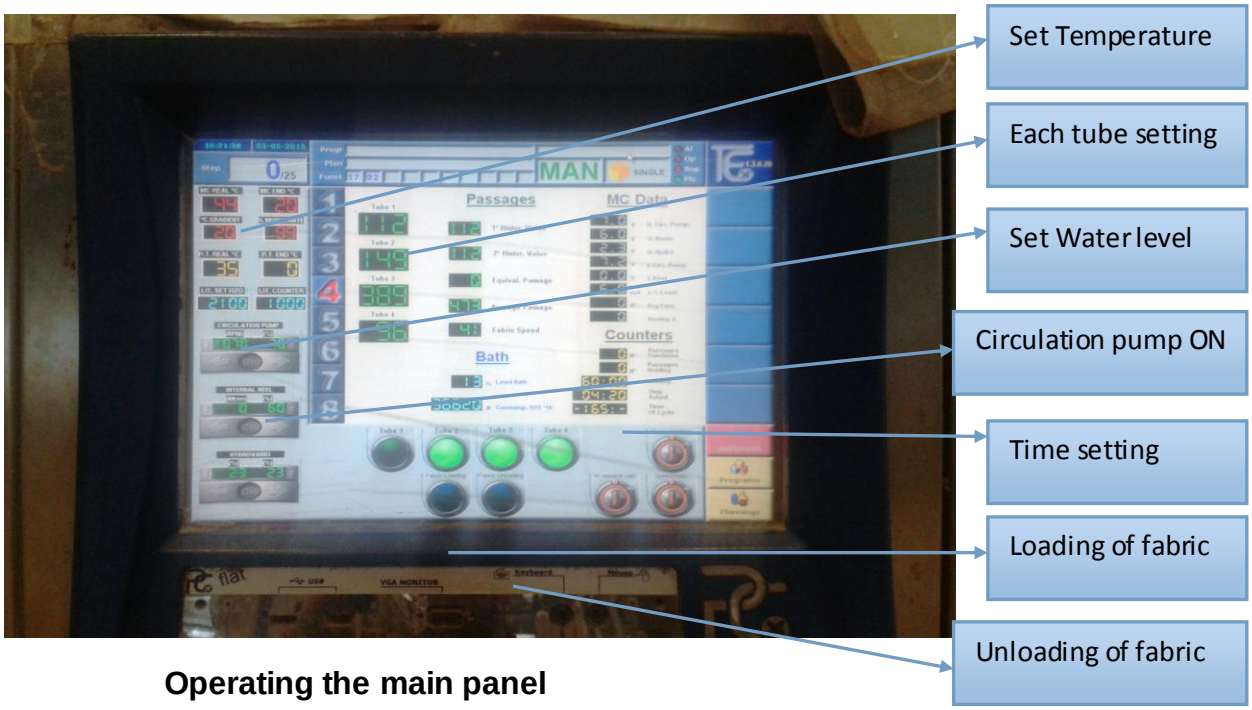
5 Highly efficient stainless steel centrifugal pump

6 Electromagnetic flowmeter

5. Operating Soft flow dyeing machine:

Switch ON the Main power

Open the steam, air and water valve



Operating the main panel

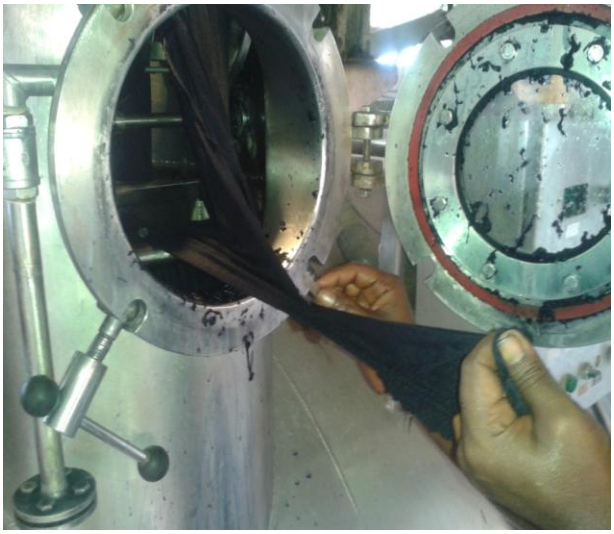
Placing exact box for dyeing

Loading of the machine inside main vessel

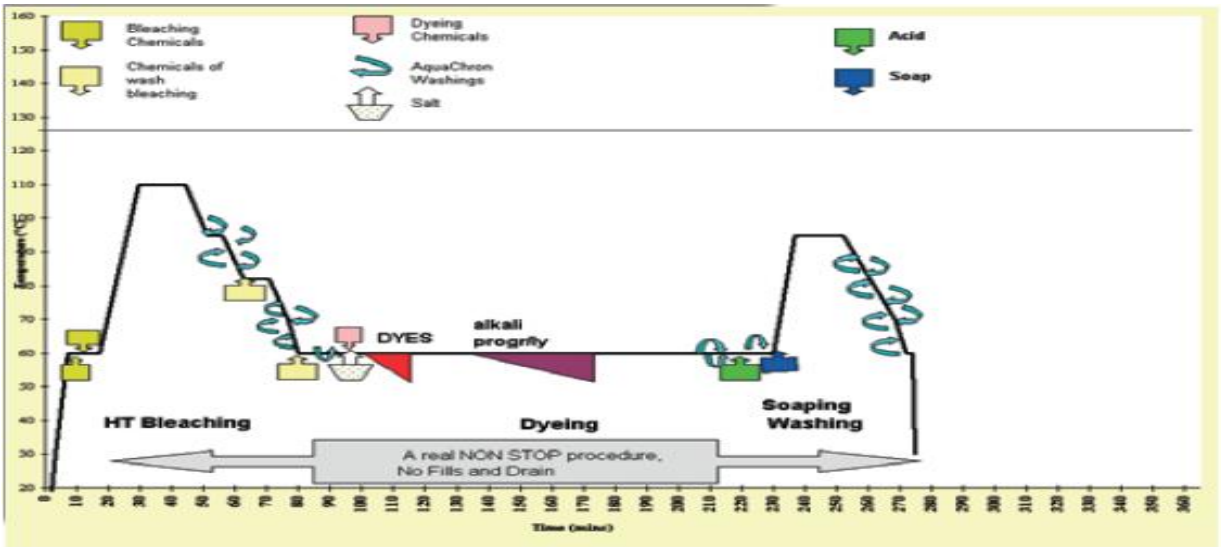
Addition of dyes in main tank

Operating main panel

Drain last processed chemical



Finally check the shade



Temperature v/s Timing chart (process wise)

Unloading of Fabric from Soft Flow Dyeing machine

- Understand and follow the instruction from lot card and programme book.
- Switch the main power ON and then open compressed air, water valve and steam.
- Prepare all the chemicals in advance with required concentration.
- Keep all the prepared chemicals ready for entire process.
- Check the quality and lot number of the fabric before putting on the machine by checking the label.
- Transport the fabric to be run, to feeding unit of the machine using hydraulic hand puller.
- Load the fabric inside the machine by using take up roller.
- Switch on circulating pump while starting the machine.
- Set the sequence of operation in the presence of shift supervisor. (like Scouring, bleaching, dyeing, washing).
- Set the recipe and weigh the chemicals according to the requirement.

- Set the time and temperature of each process to be run.
- The main dyeing vessel is to be filled with required level of water.
- Observe the defect in the fabric before and during the process, report to the shift in-charge if any irregularities observed.
- Keep the speed of machine uniform from starting to end of the process.
- Check actual flow rate of each chemical from flow meter as well as the operating monitor**.**
- Check for various defects in the unloading fabric like stains – dust, chemicals, rust, handling stains, crease, water dropping, oil, grease, etc.

Cleaning in soft flow dyeing machine:

- Remove regularly accumulated dust and dirt from the machine.
- Clean the main dyeing vessel and chemical preparation tank during every process change.
- Clean the circulation line and filter properly.
- Clean all the level sensor and temperature sensor.
- Collect all the waste and store at designated place.

6. INSTRUCTIONS DURING SHIFT CHANGING:

Taking charge of duties while starting of shift:

- Come at least 10 - 15 minutes earlier to the work place.
- Meet the previous shift operator and discuss regarding the issues faced by them with respect to the quality or production or spare or safety or any other specific instruction etc.
- Understand the Fabric being processed & process running on the machine.
- Ensure technical details are mentioned on the job card & displayed in the machine.

- ❖ Check the next batch to be processed is ready near the machine.
- ❖ Check the cleanliness of the machines & other work areas.
- ❖ Question the previous shift operator for any deviation in the above and bring the same to the knowledge of the shift superior.

Handing over charge at the end of shift:

- ❖ Properly hand over the shift to the incoming operator.
- ❖ Provide the details regarding fabric quality & the process running on the machine.
- ❖ Provide all relevant information regarding the stoppages or breakdown in the machine or any damage to the material or machine.
- ❖ Ensure the next lot to be processed is ready near the machine
- ❖ Get clearance from the incoming counterpart before leaving the work spot.
- ❖ Report to the shift supervisor in case the next shift operator doesn't report for the shift.
- ❖ Report to the supervisor about the quality / production / safety issues/ any other issues faced in the shift and leave the department only after getting concurrence for the same from supervisor.
- ❖ Collect the wastes from waste bags, weigh them & transport to storage area.

7. Importance of Health and Safety:

- ❖ Use and maintain personal protective equipment such as Hand Gloves, Gum Boots, head cap etc., as specified.
- ❖ Never handle chemicals with bare hands
- ❖ Report to the supervisor about any service malfunctions in the machine that cannot be rectified.
- ❖ Store materials and equipment at their designated places.

- ❖ Minimize health and safety risks to self and others due to own actions.
- ❖ Monitor the workplace and work processes for potential risks.
- ❖ Do not carry any metallic parts during machine running as there are chances of fire and damage to machine parts.
- ❖ Take action based on instructions in the event of fire, emergencies or accidents and participate in mock drills/ evacuation procedures organized at the workplace as per organization procedures.