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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.

**DENSITY:** The mass per unit volume

**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.

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

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

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

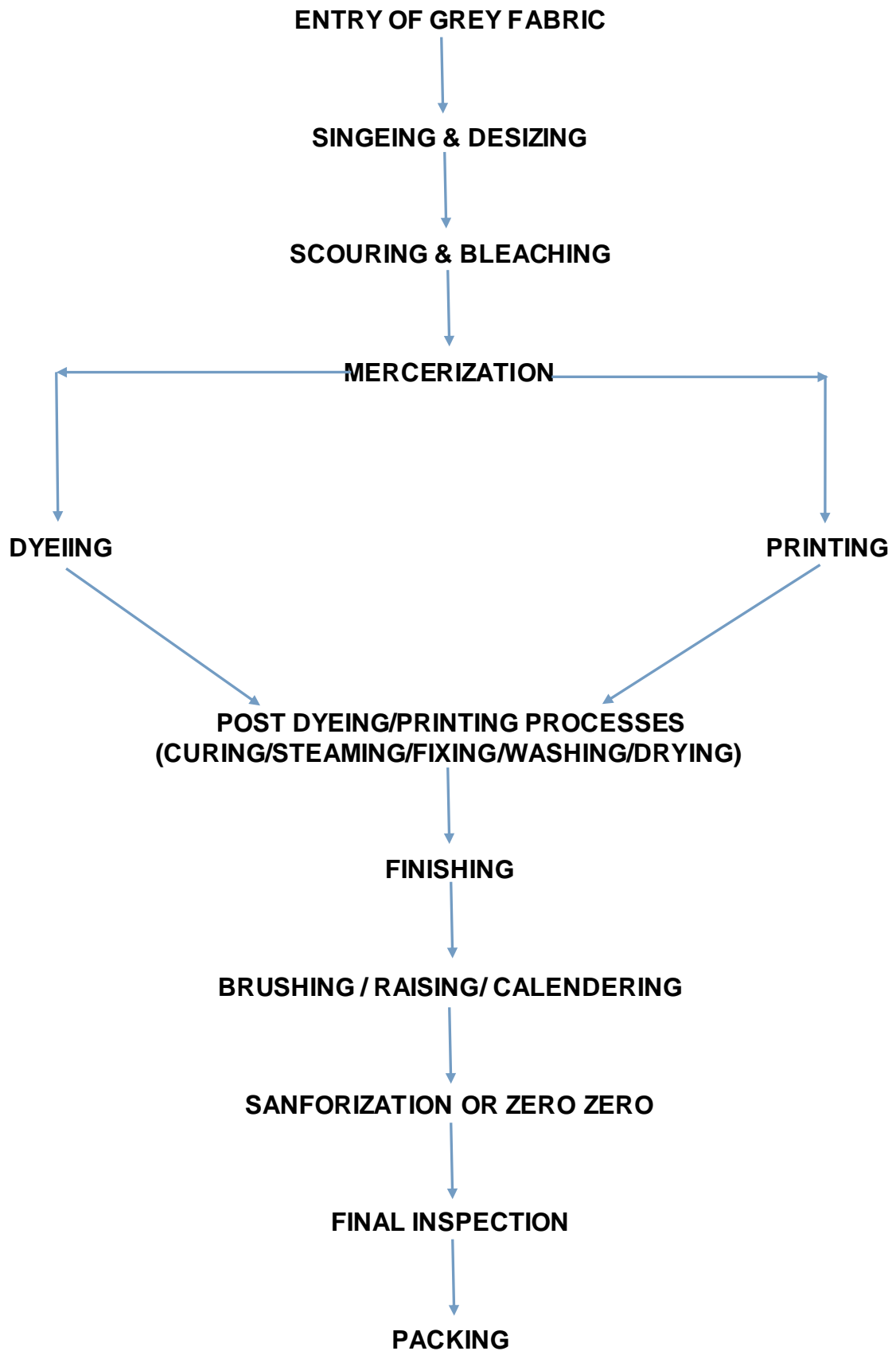
**SOFTENER:** A product designed to impart soft mellowness to the fabric.

**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



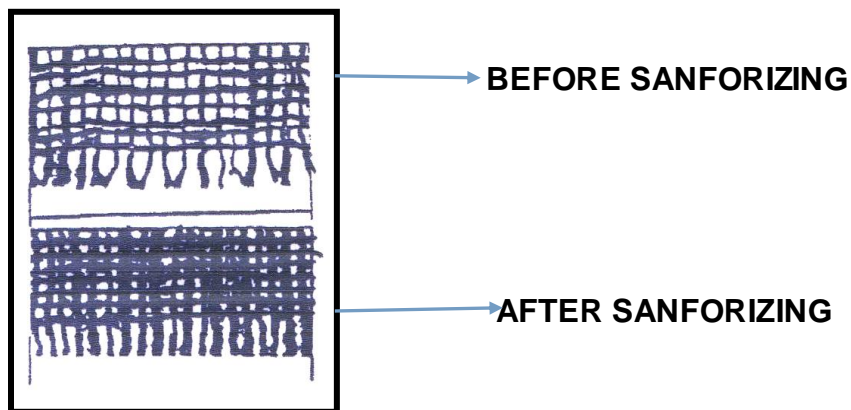
### 3. Brief Note on zero zero finishing machine:

It is the **Controlled compression shrinkage** or **pre-shrinking** of the fabric by passing the fabric into rubber unit. This process forces the yarns closer together and the fabric becomes thicker and heavier and the dimensional stability of the fabric improves. This process is also called “**sanforization**”.

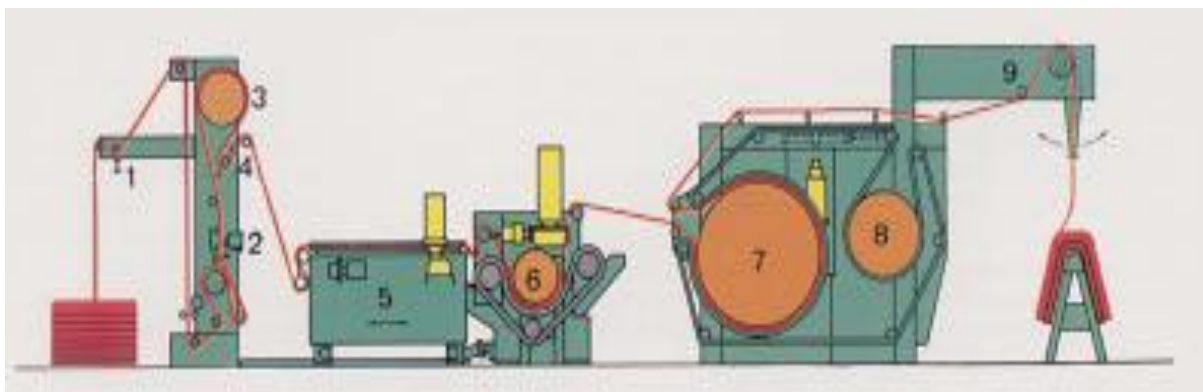
#### What is shrinkage?

A negative change in the dimensions of textile material which involves a reduction in area (length / width) of a fibre, yarn, fabric or other textile due to the influence of various operation like wetting, laundering, dry cleaning, etc. During sanforization process the pre-shrinkage has been applied on the fabric. The following figure shows the effect of zero zero finish.

#### Effect of zero zero finish:



#### PASSAGE OF FABRIC IN SANFORIZING MACHINE:



1 - Draw roller (fabric entry). 2 - Water spray unit. 3 - Steaming drum. 4 - Skewed fabric straightening roller. 5 - Clip type 6 - Rubber blanket shrinking unit. 7 - Felt calendar. 8 - Felt drying cylinder. 9 -Plaiter

#### 4. Details of zero zero finishing machine:

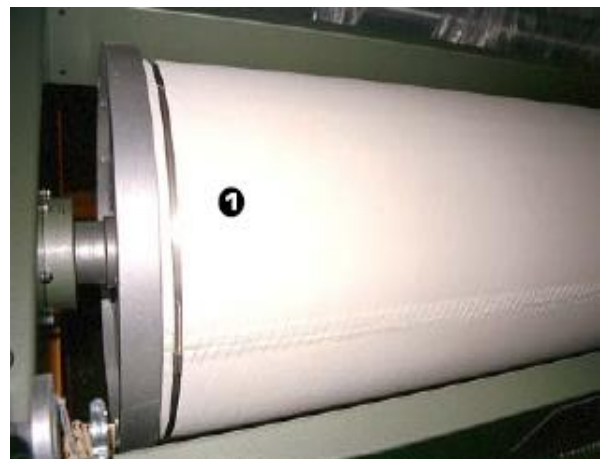
**Inlet J-scray:** This part is used to store the fabric during the batch change and this Inlet unit contains various parts like tension device, draw roll, pressure roll and break roll. The important functions of the above rollers are to feed the fabric evenly throughout the machine.

**Damping Cylinder:** The damping cylinder provides intensive, uniform and controlled steaming of the fabric. The damping cylinder has a steam-heated inner shell. This inner shell is surrounded by a steam permeable wire mesh, around which a mangle cloth is wrapped in several layers. The cylinder is heated from the inside with saturated steam.

**Mahlo device (weft straightener):** It has two bow and three skew rollers which correct the skewness and bowness and make the weft yarns straight.



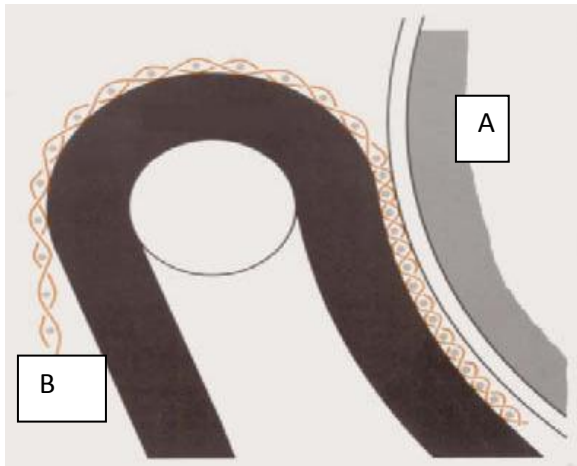
**Weft straightener**



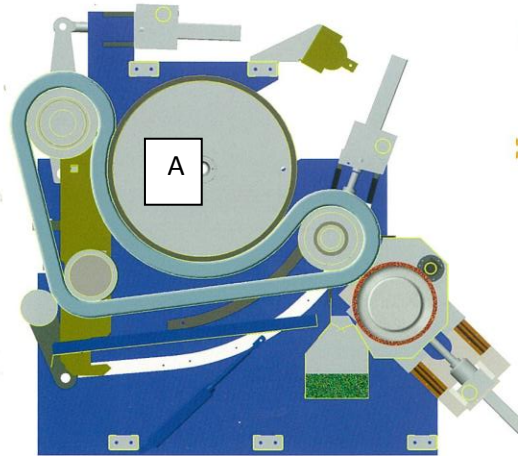
**Damping Unit**

**Rubber unit:** It is the heart of the machine, main function of this unit is to give warp-wise shrinkage to the fabric. It consists of rubber heating cylinder, endless rubber, pressure roll and tension roll. A stainless steel cylinder, which has micro-polished surface that ensures minimum friction between fabric and cylinder so that the fabric is free to follow the movement of the rubber.

## Principle of applying shrinkage on fabric:



*Hot cylinder (A), thick rubber, fabric (B)*



*Rubber unit*



**Actual view of rubber unit**

Fabric is passed between hot cylinder and endless rubber, heating of the cylinder takes place by steaming arrangements. Pressure is applied on the fabric between the rubber and cylinder by pressure roll. During this above operation shrinkage takes place on the fabric. (Ref Fig).

**Squeeze rolls:** Squeeze rolls squeezes away extra water from rubber after water spray.

**Felt unit:** During drying of fabric in the felt unit, the moisture is uniformly absorbed from the fabric by the felt blanket. And the shrinkage of the fabric is set. This unit is also having felt drying cylinder, which dries the endless felt cover.

**Cooling cylinder:** This cylinder is used to further cool the fabric to normal temperature.

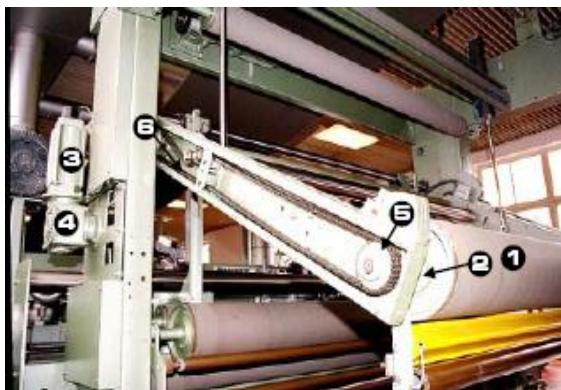
**Batching and plaiting unit:** This unit winds the fabric on a frame or plaits the finished fabric in a suitable box/ trolley.



**Out let J-scray**



**Felting unit**



**Batching Arm**



**Exit plaiter arrangement**

## 5. Operating zero zero finishing machines:



**Switching ON main panel**



**Opening of steam valve**

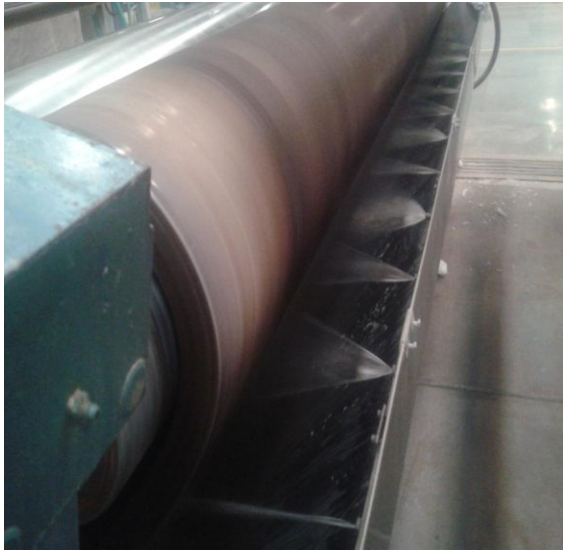


**Fabric passage without crease**



**operating of main panel board**





**Check the water spray in rubber unit**



**adjusting the tension while running**



**Checking the final width, shrinkage and defects in fabric:**

- ❖ Understand and follow the instruction from lot card and programme book.
- ❖ Switch ON main power and then open the compressed air, water valve and steam.
- ❖ Check the rubber unit and felt unit condensate line, while starting the machine.
- ❖ 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 the inlet feeding unit of Zero Zero machine using hydraulic hand puller or electric truck.
- ❖ Stitch the two end, one end of the fabric is to be finished and other one leader fabric in the machine and ensure straightness of fabric without crease
- ❖ Observe for any defect in the fabric before and during the process and report to the shift in-charge if any irregularities observed.
- ❖ Set the speed of the machine as per supervisor's instructions (For normal finishing operation 50-100 m/min (meters per min), it varies depends upon the quality. In case of light weight GSM fabric it requires more speed and vice versa.)
- ❖ Ensure weft straightener (Mahlo) is 'ON' and check visually the warp and weft pattern in the fabric are straight.
- ❖ Do not allow selvedge folds and improper feeding of fabric in the inlet of the machine.
- ❖ Set the temperature of rubber unit (90 °C – 120 °C) & felt unit (135 °C – 150°C) or as instructed by supervisor before starting the machine.
- ❖ Check the potential shrinkage of the fabric before starting of machine, Set required shrinkage accordingly.
- ❖ If the set shrinkage and actual shrinkage differs, then stop the machine and do proper grinding on the endless rubber as per supervisor's instructions
- ❖ Check the exit width of the fabric frequently and adjust the fabric tension according to requirements by changing tensioner roll pressure.
- ❖ Check the actual shrinkage of the fabric in the machine outlet by shrinkage scale. Maintain required moisture content in the outlet fabric.
- ❖ Check for any defects in the finished fabric like stains – dust, chemicals, rust, handling stains, crease, water dropping, oil, grease, etc.
- ❖ If the machine stops for long time, leader fabric to be put on machine and rubber unit to be cooled immediately without delay.

### **Cleaning in Zero zero finishing machines:**

- ❖ Remove regularly the accumulated dust and dirt from the machine.
- ❖ Clean all the rollers with the dry fabric whenever required.
- ❖ Clean the rubber unit, water spray and felting unit at regular intervals.
- ❖ Clean the inlet sensors and fabric guides properly.
- ❖ Collect all the wastes and store them at designated place

### **6. INSTRUCTIONS DURING SHIFT CHANGE:**

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, 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 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 the organization procedures.