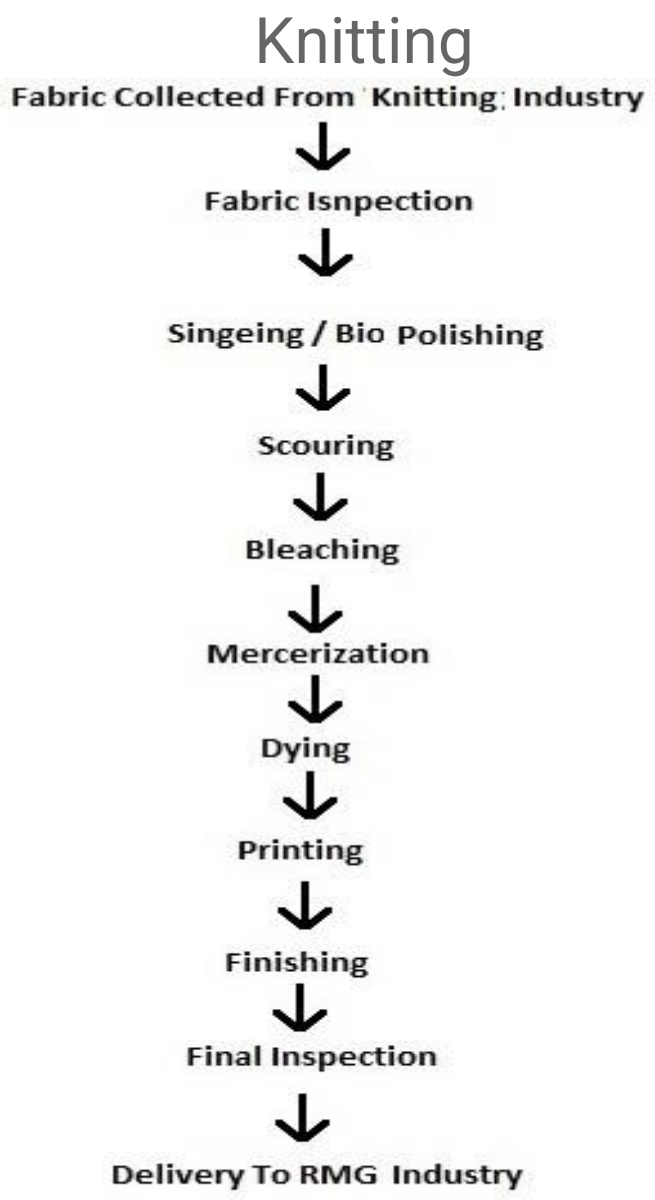
Flow Chart of Textile Wet Processing For Knit Fabric (Main)



Knitting

The amount of shrinkage for any given knit fabric is primarily dependent upon the product specifications and the knitting parameters used to meet those specifications. The predominant fabric specifications that determine the shrinkage of a knitted fabric are the weight, stitch counts, and width at which the fabric is sold.

The knitter uses those specifications to establish another set of specifications for knitting. Whether or not these knitting specifications are achievable is determined by the knitting machinery available

to the knitter. The gauge of machinery (number of needles per circumference inch of the cylinder) determines the range of yarn counts that can be used. For a given knitting machine gauge, a restricted range of yarn counts can be knit.

Finer yarns are more expensive compared to coarser counts. In order to maintain target weights in knitting finer yarns, the stitch length must be changed. The stitch length is the amount of yarn in one stitch repeat of the pattern. Heavier yarns when knit at the same stitch length as fine yarns will result in a heavier fabric. In essence, for any given yarn count, knitting a smaller loop results in a heavier, more stable fabric. Knitting a shorter loop also results in less length shrinkage, but higher width shrinkage for any specified finished width. The width of a fabric is related to the number of needles in the cylinder and the stitch length. Each needle equals one wale. The longer or looser the stitch in each wale, the wider the fabric, and the lighter the weight. This is important because should there be a need to knit a fabric wider by increasing the stitch length, this will affect the weight and shrinkage.

In summary, the choice of yarn count, machine gauge, the number of needles in the cylinder, and the stitch length has a profound effect on shrinkage performance of a fabric.

Scouring | Types of Scouring Process | Application of Scouring in the textiles dyeing industry

- Dyeing, Wet Processing

Introduction: Scouring is a procedure through which **natural impurities** (oil, wax, gum, fat, etc) and **added impurities** are eliminated fully during the manufacturing process.

All raw textiles are referred to as **'gray fabric material'** when in natural form. This gray fabric is natural with color, odor, and impurity not appropriate for clothing. Not only are the natural impurities remaining on the gray matter but also the additional products produced during cultivation, e.g. raw cotton has impurities such as water, nitrogen, mineral matter, waxes, pigment residues, etc.

Scouring objectives:

The principal aim of scouring is to remove textile material impurities. Some other objectives are;

- In order to make the material extremely hydrophilic.
- To considerably absorb textile products without suffering chemical or physical harm.
- A neat material is generated by adding alkaline.
- For cotton removal of non-cellulosic material.
- In order to make the textile material prepared for subsequent bleaching.

The elimination of these natural colorants and add-ons to create the material in a phase ready for **dyeing** is called **scouring**.

Method of Scouring: Scouring

may be done separately or in conjunction with other treatments (usually bleaching or de-sizing) in all types of substrates;

- Woven fabric (sized or de-sized).
- Knitted fabric.
- Yarn.

For yarn and knitted textiles, **scouring** is typically a **batch process** carried out on the same material that is later used for dyeing. Woven fabric is **continuously scoured** using the pad-steam method.

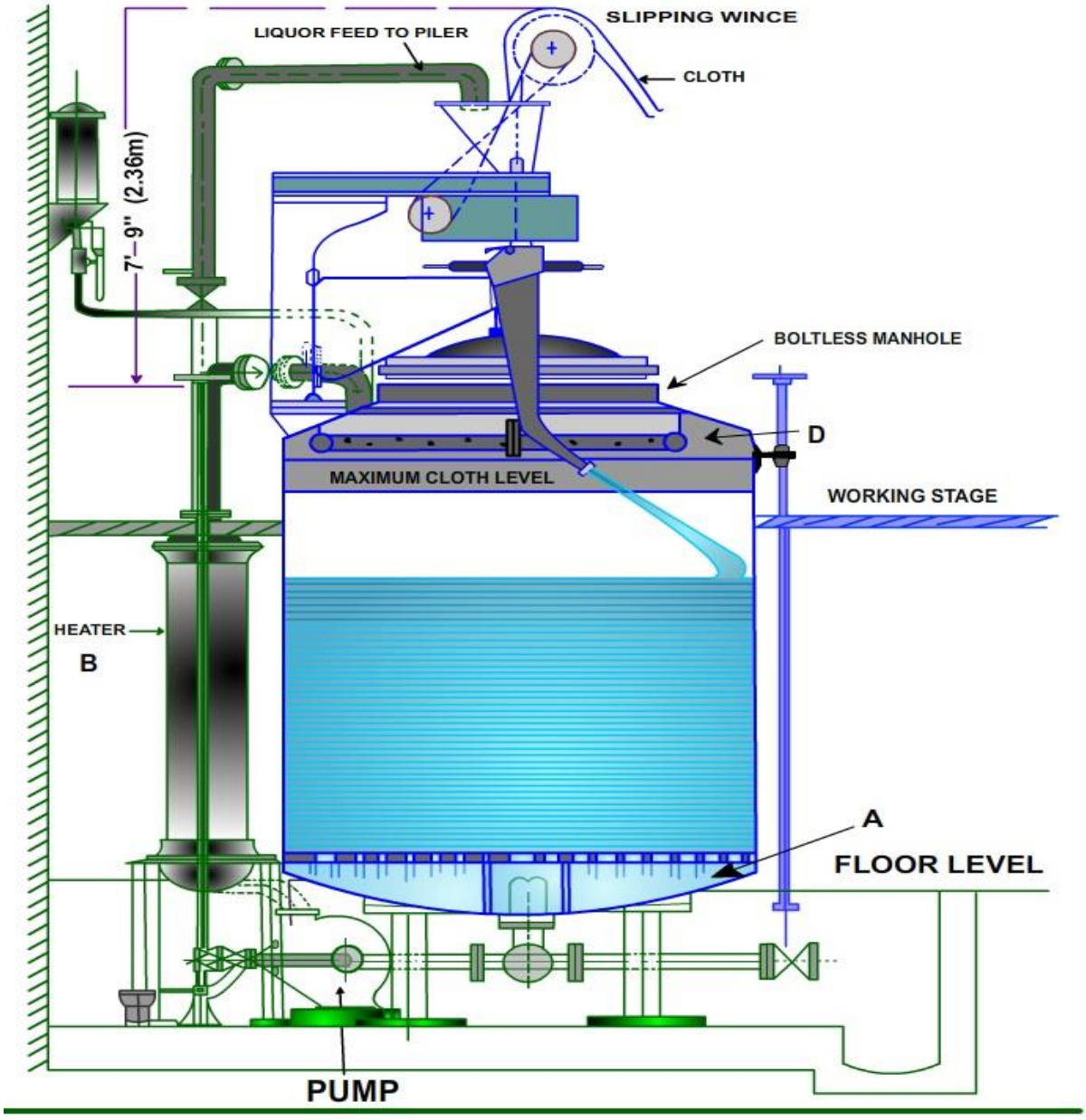
So, actually, there are two types of method are using for scouring;

1. Batch process/Discontinuous process. (by Kier Boiling/Jigger/Winch dyeing machine)
2. Continuous process. (by J-Box machine)

1. Batch process/Discontinuous process

: In the batch or discontinuous process, **Kier Boiling machine** is mostly used. There also we used Jigger and Winch dyeing machine. But here we only discussed the scouring process of Kier Boiling machine.

Kier Boiler is a cylindrical long, mild steel or a cast-iron container fitted with two tubular perforations (disc with several holes). One of them is on the ground, and one is on the top. These disks are linked to the upper compartment with a number of tunes which bring the liquor. Steam is carried through the center of the bay. Thus, the liquor pipes are surrounded by steam that heats them.



Kier Boiler Machine

Recipe for batch scouring process:

SL. No.	Parameter	Amount

1	M:L ratio	1:100
2	Caustic Soda	0.5 – 2.4 g/L, 50 – 240 gm
3	Soda ash	0.5 – 1g/L, 50 – 100 gm
4	Wetting agent	0.5 – 1g/L, 50 – 100 gm
5	Sequestering agent	0.5 – 1g/L, 50 – 100 gm
6	Temperature	100-120ºC

Precaution needs before batch scouring:

- Clean the kier boiler.
- The material must be uniformly packaged.
- Full immersion of the need for the fabric.
- The liquor should be removed without water after boiling.
- Check all joining components before beginning.
- Scouring solution should always remain for Fabric.

Process Description of batch scouring:

1. The fabric is packed into M/C and stored in a tube shape.
2. A circular tube to the fabric pumps the warm liquor and spray it.

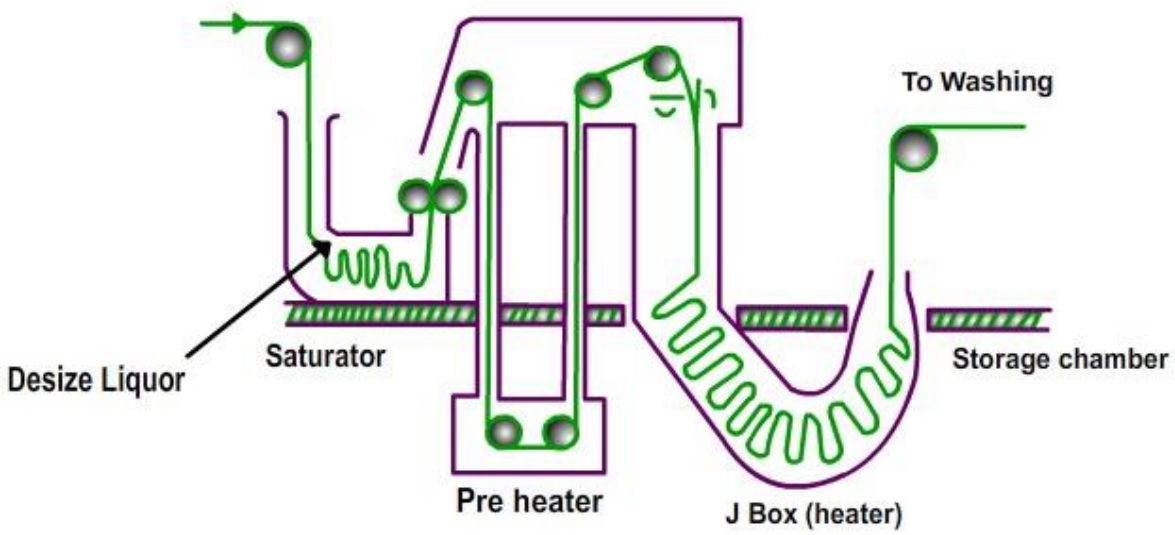
The liquor goes through the packed cloth slowly and collects on the opposite side of the kier. The liquor pumped to the heater again using a centrifugal pump and this cycle is repeated.

3. After scoring, 80^0 C water is used to remove material impurities from the textile.
4. Afterward, 0.1% acetic acid is neutralized and cold cleaning is done.

2-Continuous scouring process:

In **the Continuous process**, J-Box machine is used. It is called **J-Box machine** because the scouring vessel looks like the English letter 'J'. The J-box is mainly a steel chute with big capacity fabrics. In comparison to a keir where it is first in the last out, the fabric is supplied from one end and pulled from the other (first out). The internal side of the **J-box** is polished and is insulated to minimize thermal losses. De-sizing, scoring, and bleaching can be

performed at once in this system.



J-Box Machine

Recipe for Continuous Scouring process:

SL. No.	Parameter	Amount
1	M:L ratio	1:100
2	Caustic Soda	5 g/L, 500 gm
3	Wetting agent	1- 4.5 g/L, 100-450 gm
4	Sequestering agent	1-5 g/L, 100-500 gm

Scouring is a very important process before dyeing. **Scouring** will depend on the kinds of fabric, the color of the fabric, the cleanness of fabric, the twisting of fabric, the count of fabric, and the fabric construction.

By the **scouring process,** Pectose and pectin are transformed into pactic acid-soluble salts. It dissolves mineral matter. Particles of dust will be removed. Residual materials are divided into soluble products.

Advantages and disadvantages of Discontinuous and Continuous Scouring process:

SL. No.	Discontinuous Process	Continuous Process
1	In this process fabric is scoured in rope from.	In this process fabric is scoured in open width form.
2	This process is suitable for small order.	This process is not suitable for small order.
3	Uneconomical process for large order.	Economical process for large order
4	More time required then continuous process	Less time consumption process

Scouring is a very important process before dyeing. **Scouring** will depend on the kinds of fabric, the color of the fabric, the cleanness of fabric, the twisting of fabric, the count of fabric, and the fabric construction.

By the **scouring process,** Pectose and pectin are transformed into pactic acid-soluble salts. It dissolves mineral matter. Particles of dust will be removed. Residual materials are divided into soluble products.