

PRE-TREATMENT OF DIFFERENT FIBERS – PART IV

REF: TT/ DECEMBER 2020/ WK 3

1) Scouring of Wool (Continued).....

The amount of wool grease present on the wool depends on the sheep breed. The amount of suint also depends on the breed type. Wide differences in the types and levels of wool contaminants require different machinery and processes for wool scouring. Like, the large amount of fine dirt present on some types of wool is very difficult to remove and needs different kind of scouring process to remove those, a different type of wool is easy to scour, need different type of scouring process. Raw wool is also contaminated with vegetable matter, if the level of vegetable matters contamination is high the wool requires to be carbonized to remove it.

Traditionally, wool is scoured in hot solution of soap and alkali. With the development of synthetic detergents soap was replaced. Non-ionic detergents are commonly used now. Soda ash is mostly used as alkali which is used to stabilize the emulsified wool grease and to prevent their re-deposition back on to the wool.

Beside this, another wool scouring process is tried. That is the use of solvent scouring systems in place of aqueous solution in order to minimize entanglement of wool.

Scouring process of wool involves passing the unscoured wool through series of wash boxes. In the initial 2 to 3 wash boxes the solution contains warm water, detergent and alkali. The suint dissolves quickly in the first wash box while the wax and dirt particles are steadily removed by a combination of mechanical agitation and gravity, and by the squeeze rollers. As the wool moves through the boxes it becomes cleaner. The wool is finally rinsed to remove the detergent and the remaining solid particles such as dirt. The first rinse is done using cold water, followed by hot water rinse. The scoured loose wool is then passed into a continuous drier, before it is passed through a number of machines which mechanically beat the wool to remove water insoluble compounds, such as sand and dust, which are not fully removed during scouring.

Fiber damage in wool scouring - Wool is a comparatively weak fiber. During scouring wool is passed through different conditions like pH, temperature and mechanical agitation. These conditions lead to fiber damage and loss of strength. The nature of the protein chains in wool mean that the hydrogen bonds are dissociated in aqueous conditions causing strength loss. Disulphide bonds can also be reduced in some conditions, causing a further wet strength loss which is generally reversible. Wool can also become more susceptible to chemical damage in an



aqueous medium since the protein chains can be ionized and are attractive to small, charged molecules such as acids and alkalis. Alkaline conditions are far more damaging to the fiber, and at pH more than 9.5 will cause yellowing and damage to the fiber. Thermal degradation of wool will occur with prolonged exposure to even relatively mild conditions, such as those experienced during scouring. Mechanical damage is generally very low because the action of the moving parts in scouring is relatively gentle. Following proper process control ensures minimum damage of wool fibers during scouring.

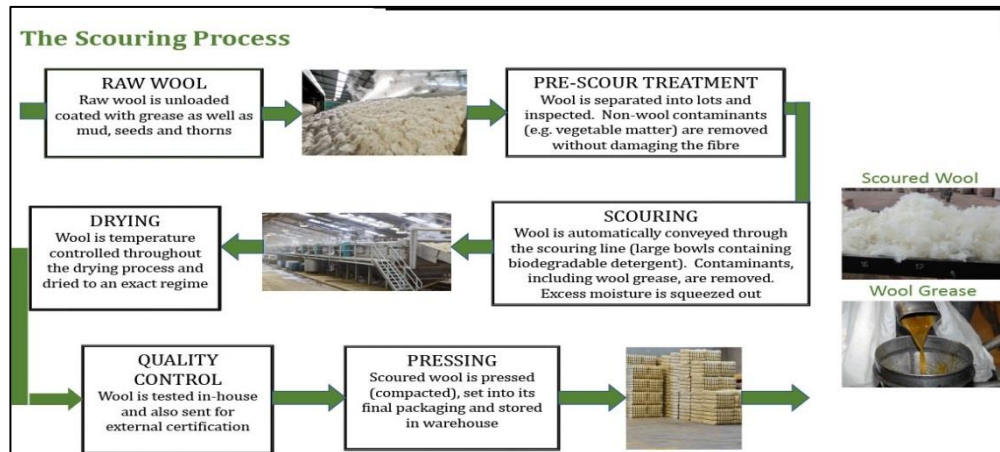


Fig 1.1 Scouring of wool fiber – Process Flow Diagram

Ref: nzwoolscouring.co.nz

References:

1. woolwise.com
2. woolmark.com
3. textileapex.blogspot.com
4. textileanalysis.blogspot.com
5. awtawooltesting.com.au
6. sgsgroup.in

Testing parameters of Scoured Wool

- Yield
- Moisture content or Conditioned mass
- Mean fiber diameter
- Color

.....To be continued.....

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Last week's Answers: 1) BLEACHING 2) WOOL 3) KERATIN 4) SUINT

Wishing you a great week ahead!

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