KRISHNENDU DAS

SEMESTER – IV

SKILL ENHANCEMENT COURSE

SERI – TEXTILE TECHNOLOGY (Unit -5)

SILK FINISHING OBJECTIVE AND METHOD

In textile manufacturing, finishing refers to the processes that convert the woven or knitted cloth into a usable material and more specifically to any process performed after dyeing the yarn or fabric to improve the look, performance, or "hand" (feel) of the finish textile or clothing.The precise meaning depends on context.
Some finishing techniques such as bleaching and dyeing are applied to yarn before it is woven while others are applied to the grey cloth directly after it is woven or knitted.Some finishing techniques, such as fulling, have been in use with hand-weaving for centuries; others, such as mercerisation, are byproducts of the Industrial Revolution

Special finishes for natural fibers

- **Bio-polishing** removes the protruding fibers of a fabric through the action of an enzyme. Enzymes, such as cellulose for cotton, selectively remove protruding fibers. These enzymes may be deactivated by an increase in temperature.
- **Mercerisation** makes woven cotton fabric stronger, more lustrous, to have better dye affinity, and to be less abrasive.
- **Raising** lifts the surface fibers to improve the softness and warmth, as in flannelette.
- **Peach Finish** subjects the fabric (either cotton or its synthetic blends) to emery wheels, making the surface velvet-like. This is a special finish used mostly in garments.
- **Fulling** or *waulking* was a method of thickening woolen material to make it more water-resistant.
- **Decatising** to bring dimension stability to woolen fabrics.
- **Calendering** makes one or both surfaces of the fabric smooth and shiny. The fabric is passed to through hot, fast-moving stainless steel cylinders.
- **Sanforizing or Pre-shrinking** prevents a fabric and the produced garment from shrinking after production. This is also a mechanical finish, acquired by feeding the fabric between a roller and rubber blanket, in such a way the rubber blanket compresses the weft threads and imparts compressive shrinkage.

- **Crease-Resist finish** or "wash-and-wear" or "wrinkle-free" finishes are achieved by the addition of a chemical resin finish that makes the fiber take on a quality similar to that of synthetic fibers.
- **Anti-microbial finish** causes a fabric to inhibit the growth of microbes. The humid and warm environment found in textile fibers encourages the growth of the microbes. Infestation by microbes can cause cross-infection by pathogens and the development of odor where the fabric is worn next to skin. In addition, stains and loss of fiber quality of textile substrates can also take place. With an aim to protect the skin of the wearer and the textile substrate itself, an anti-microbial finish is applied to textile materials.

CHEMICAL FINISHING

Chemical finishing is defined as and includes all processes after coloration that provide better properties and that enable the qualified use of the treated textiles. But dyers and printers are often responsible for finishes that improve colour fastness. Nowadays coloured textiles have to fulfil many requirements. Therefore improvement in the colour fastness is a type of chemical finishing of particular practical interest and importance.

Properties provided by these finishes are mostly improved wet fastness, for example washing, water, perspiration and ironing fastness, then better light fastness and only to a small extent improved crocking and rubbing fastness. For other kinds of colour fastness, for example dry ironing, chlorine, peroxide and carbonisation, there are no known possibilities for improvement by an after treatment. The market importance of these finishes is based on customer preferences and economic production demands. For a better understanding, each of these three quite different fastness improvements will be dealt with separately.

MECHANICAL FINISHING

Mechanical finishing refers to any process performed on yarn or fabric to improve the appearance, performance, or 'hand' of the clothing. Fabric lustre, smoothness, softness, residual shrinkage and hand are examples of the properties that can be altered by mechanical finishing.

Mechanical Finishing in Textile:

Finishing is the last step in fabric manufacturing and is when the final fabric properties are developed. Textile finishing refers to any process, mechanical or chemical, post dyeing, which leads to an improvement in the look, handle, or performance of the fabric, be it a woven, knitted, or nonwoven material. Generally, these processes are carried out

on the textile in fabric form, but some can also be applied to fibers or yarns. Textile finishing gives a textile its final commercial character with regard to appearance, shine, handle, drape, fullness, usability, etc.

Textile finishes generally fall into two classes: dry or mechanical finishes, such as calendering or mangling, and wet or chemical finishes, such as fluorochemical or flame retardancy. There is room for crossover, however, with some finishing techniques involving both mechanical and chemical finishes. Mechanical finishing or 'dry finishing' uses mainly physical (especially mechanical) means to change fabric properties and usually alters the fabric's appearance as well. In this article we only discuss on mechanical finishes of fabric.

Application of Mechanical Finishes in Textiles:

Mechanical finishes use heat, pressure, and rollers to impart a particular finish to the textile, with the aim of improving either its appearance or its handle. Mechanical finishes include calendering, embossing, and napping. A comprehensive overview of mechanical finishes is beyond the scope of this chapter, but key finishes are discussed.

Calendering:

Calendering uses high temperatures and pressures to change the nature of the fabric; this will obviously depend on the initial state of the fabric. Soft fibers, or open-weave fabrics, are obviously much more readily affected as compared with fabrics with a tight weave or those composed of hard fibers.

Frictional calendering:

In frictional calendering, there is a speed differential between the pair of rollers, such that a smooth, shiny appearance is created on the textile material. One of the rollers is made from smooth metal and may be heated; this rotates faster than a second softer roller, which effectively polishes the fabric.6 In addition to the friction created, which produces a glossy finish to the fabric, the process also reduces the gap between the warp and weft threads. Using this process finishes, such as Chintz can be produced. In this case, a padding machine applies the finishing solution to the fabric, which is then partially dried and friction calendered. Utilization of a resin-based solution leads to a permanent finish,
whereas with starch or wax, the effect is temporary.

Embossing:

This technique uses heat and pressure to impart an elegant aesthetic appeal to a fabric or garment. The fabric is pressed between an engraved heated roller and a second

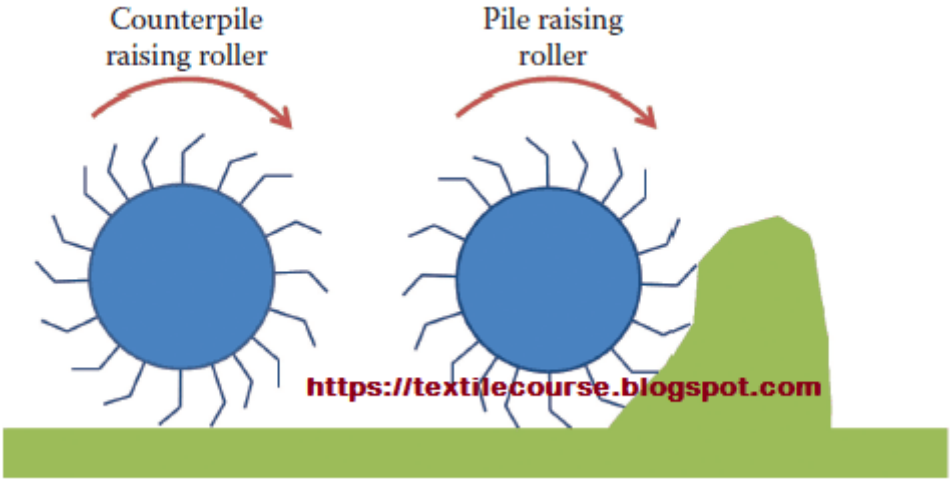
softer roller, which causes the embossed image to be raised when compared to the background. In a textile context, embossing is typically used in nonwovens such as nappies, napkins, and tissue papers, where one may wish to create a logo or a pattern. In addition, embossing can be seen on home furnishings such as curtains and cushion covers. It may also be used on fashionable evening gowns worn by celebrities attending the Oscars.

Sanforizing:

Sanforizing is a process whereby the fabric is run through a sanforizer; a machine that has drums filled with hot steam. In sanforizing process, the fabric and backing blanket (rubber or wool) is fed between a feed roller and a curved braking shoe, with the blanket kept under some tension. The tension on the blanket is released after passing the fabric and blanket between the roller and braking shoe. The net result is the compaction of the fabric. Such a simple technique permits garment making with finished textile goods to be
without fear of excessive shrinkage on laundering.

Raising or Napping:

The napping process can be traced back to Roman times, when dried teasel pods were used as part of the process, and indeed, for woolen clothes this technique persisted until relatively recently. Napping involves raising the ends of fibers out of the fabric (Figure) and is performed on both woolen and cotton fabrics, with flannelette being an example of the cotton fabric that has undergone this process. The nap is typically brushed in one direction in fabrics such as corduroy and velvet such that light will reflect off the surface in a particular way. Thus, when making garments from pieces of napped fabric, it is important that they are all laid in the same direction; otherwise, the finished garment will look like it is made of fabrics of different colors.



Raising finishing process

To effectively raise the nap in woolen fabrics, they must be damped and then subsequently dried. Modern techniques use metal needles with 45-degree hooks on the ends to pull the ends of the **yarn** from the fabric. The rollers usually alternate with one roller, with hooks directed toward the fabric feed direction, followed by one with hooks counter to the fabric feed direction. Rotating brushes counter to the rollers cleans the napped fibers from the hooks.

Sueding:

This process is carried out by means of a roller coated with abrasive material. The fabric has a much softer hand and an improved insulating effect thanks to the fibre end pulled out of the fabric surface.

Mechanical finishing effects on fabric:

1. **Framing:** Correct and uniform width and smoothness (Stenter frame)
2. **Raising:** Fluffy surface, soft handle and warm fabric.
3. **Shearing:** Removal of short hairs from smooth fabrics.
4. **Rateening:** Ratine (curled) and similar effects produced on raised fabrics by special brushing or rubbing devices.
5. **Calendaring:** Smoothing and compacting with hard, heavy rollers.
6. **Embossing:** Relief effects by means of an engraved roller.
7. **Sanding** / **Emerising:** Light raising of the surface by emery rollers.
8. **Pleating:** Introduction of permanent creases.
9. **Shrinking:** Allowing or forcing the fabrics to shrink in the length direction.
10. **Pressing:** Smoothing by means of pressing platens; mainly for wool.
11. **Decatizing:** Steam pressing treatment for wool fabrics to improve uniformity of appearance, dimensional stability and handle.

Chemical finishing effects on fabric:

1. **Water repellent:** Temporary or durable water repellent fabric by silicones.
2. **Stain resistant:** Stain resistant fabric is made by silicones.
3. **Antistatic:** To prevent the build up static charge at low humidity.
4. **Flame resistant:** To make fabric non-flammable or difficult to ignite.
5. **Hygienic:** Prevent to grow micro-organism on the textile and on the human skin.
6. **Rot proofing:** Protection of the textile from organisms that promote decomposition.
7. **Anti-pilling:** Reduction of the tendency for pilling.
8. **Easy care:** Reduce the sensitivity of the fiver to moisture and to creasing.
9. **Felting:** Encourage the natural felting properties by repeated compressions.

10. **Anti-felting:** Reduce the natural felting properties.
11. **Moth proofing:** Make the fiber inedible by the moths.
12. **Parchment zing:** To prevent the degradation of the fiber.

Inspection of finishing fabric:

The finishes fabric is further inspected to find any types of fault formed.

Folding/Rolling:

The finished fabric is folded according to requirement which is easy to carry.

Packing:

The folded fabrics are packed either according to length requirement or weight requirement.