DESIZING

Desizing is a crucial step in textile processing, particularly for fabrics made from natural fibers such as cotton, linen, and wool. It involves the removal of sizing agents applied to the fabric during the manufacturing process or added for stability during weaving or knitting.

Sizing agents, such as starches, waxes, or synthetic polymers, are applied to yarns or fabrics

to provide stiffness, strength, and stability during weaving or knitting. However, these sizing agents can hinder subsequent processing steps, such as dyeing or finishing, if not removed.

Desizing is typically achieved through various methods:

1. **Chemical Desizing**: This involves using chemicals to break down and remove the sizing agents from the fabric. Enzymatic desizing is a common method where enzymes, such as amylases, are used to degrade starch-based sizing agents.
2. **Mechanical Desizing**: Mechanical methods, such as scouring or washing, physically remove the sizing agents from the fabric surface. High-pressure water jets or agitation in washing machines can help dislodge and rinse away the sizing.
3. **Combination Methods**: Sometimes, a combination of chemical and mechanical methods is used for more effective desizing.

Desizing is essential because it ensures that the fabric is clean and free from any sizing agents before subsequent processing steps like dyeing, printing, or finishing. Failure to desize properly can result in uneven dyeing or printing, poor fabric hand (feel), and reduced absorbency of the fabric. Additionally, desizing contributes to the overall quality and appearance of the finished textile product.

ENZYMATIC DESIZING

Enzymatic desizing is a method of removing sizing agents from textiles using enzymes, specifically amylases. This process is particularly effective for desizing fabrics that have been treated with starch-based sizing agents.

Here's how enzymatic desizing typically works:

1. **Preparation**: The fabric is prepared for desizing by soaking it in water or a desizing bath to ensure thorough wetting.
2. **Enzyme Application**: An amylase enzyme solution is applied to the fabric. The enzyme works by breaking down the starch molecules present in the sizing agents into smaller, water-soluble fragments.
3. **Incubation**: The fabric is allowed to incubate at an optimal temperature for the amylase enzyme to function effectively. This temperature is typically around 50-60°C (122-140°F), as it provides the ideal conditions for enzymatic activity.
4. **Rinsing**: After the incubation period, the fabric is thoroughly rinsed to remove the degraded starch fragments, as well as any remaining enzyme solution.
5. **Neutralization**: In some cases, a neutralization step may be required to adjust the pH of the fabric to a more neutral level, depending on the specific enzyme used and the desizing process.

Enzymatic desizing offers several advantages over traditional chemical desizing methods, including:

- Environmental friendliness: Enzymes are biodegradable and environmentally friendly, making enzymatic desizing a more sustainable option compared to harsh chemical treatments.
- Reduced energy and water consumption: Enzymatic desizing typically requires lower temperatures and shorter processing times, resulting in energy and water savings.
- Improved fabric quality: Enzymatic desizing is gentle on the fabric and helps preserve its structural integrity, resulting in higher quality finished products with improved handfeel and appearance.

Overall, enzymatic desizing is an effective and eco-friendly method for removing sizing agents from textiles, particularly those treated with starch-based sizing agents.