

THERMOMECHANICAL TREATMENT IN WET PROCESSES FOR FINISHING RAW FABRICS

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The transformation of the fibrous mass into fabric is a sequence of numerous effects. The main interactions between fibres, yarns, and fabrics are mechanical, primarily tensile loads. In the processing of textile materials, auxiliary agents are used, such as oiling – softening substances, antistatic agents, starch and the like. After the raw fabric is removed from the loom, a thin layer of dust and textile auxiliaries remains on the surface of the fibres, and inside there are residual stresses from the applied technological deformations. Raw fabrics are hard, coarse, and not suitable for direct consumption.

The finishing treatment, called ennoblement, aims to remove both internal stresses and external contaminants from the fabric. Fabric ennoblement consists of sequentially performed processes. The first process is the washing of the raw fabrics. It is carried out in an unfolded state, or with sewn fabrics as an endless rope with a cyclical passage through the washing tub. Fixing through moisture-heat treatment gives the fabrics their final structure and dimensions. The stenter machines on which thermal fixation is performed are an aggregate consisting of a spreader, an endless chain of clamps for gripping the fabric, drying chambers, and an apparatus for removing and winding the fabric. After thermal fixing, the fabric is no longer raw. The fabric is cleaned of residual substances, much of the internal stresses are relieved, and the structural positions of the threads and fibres are established, as well as the final dimensions. The final ennoblement process is dedicated to the final elimination of internal stresses in the fabrics. This is achieved through two forms of relaxation: natural and accelerated technological relaxation through steam and pressure. These treatments give the fabric a uniform, stress-free construction, and the only efforts that appear in the finished fabrics come from gravitational forces. The practical result of fabric refinement is assessed by feeling the drape-ability.

The subject of the article is the description of the machines and processes for the refinement of raw woven fabrics. The essential feature that distinguishes the processes for refining raw fabrics is the absence of chemical interactions between the fibres and the wet processing environment. The processes are based on physical effects on textile materials through mechanical deformations, heat and moisture. The purpose of the development is to separate the main finishing processes and update their implementation in modern textile technology.

Keywords: textiles, fabrics, ennoblement, drying, fixing, relaxing.

