ABSTRACT

Since more than hundred years, the process of Mercerization is accepted in the world as a process for improvement in Tensile strength, luster and dye absorption using Sodium Hydroxide and Ammonia.

In the present research work, an attempt has been made to study mercerization of Compact Yarn fabric for the value addition as desired by the elite customer and demands of Technical Textiles.

It is observed that mercerization improves the tensile strength, drape, and absorbency. However, air permeability decreases. If picks per cm are increased then tensile strength, drape coefficient, and Colour Absorption and scattering (K/S) increase significantly. However, air permeability, absorbency and tearing strength are found to decrease. The cover factor of 12 shows optimum physical fabric properties after mercerization.

Kawabata testing shows that the tensile energy, tensile extension rate, bending hysteresis, shear stiffness and shear hysteresis, are found to be more for compact yarn fabric as compared to ring yarn fabric.

The statistical method of designing the experiment and data analysis is carried out with Mini-Tab computer software. Optimum mercerization processing conditions for obtaining maximum tensile stress and strain are found out in ring and compact yarn fabric. Regression equation is also found out for obtaining maximum tensile stress of compact yarn fabric at optimum mercerizing conditions.

Mean Crystallinity Index for mercerized ring and compact yarn fabric are 42% and 45%, respectively. Orientation factor for Mercerized ring and compact yarn fabric (0.92) is same. Mean average crystal size is 06.0ηm, same for both Mercerized ring and compact yarn fabric after mercerization. The present study investigates the dyeing behaviour of mercerized fabric under different conditions of temperature, concentration, time of impregnation and stretch % during mercerization. They are evaluated for colour reflectance value and CIE whiteness of fabric samples.