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THEORETICAL MODELING OF TIGHT STRUCTURE OF OPEN-END YARN

ABSTRACT:

Mathematical model for width of fibrous ribbon has been developed in order to make tight structure of open-end yarn. For this purpose, a range of count (20, 30, 40 and 50 Tex) has been investigated to analyze the effect on rotor speed and yarn linear densities. These variables have been evaluated using mathematical model. The speed of spinning rotor and the linear density of yarn are directly affected on the width of fibrous ribbon. The analytical results are plotted with values of the width of fibrous ribbon, which provided tight structure of yarn at the range of spinning rotor speed between 70 000 min^{-1} and 100 000 min^{-1}.

DEFINITION OF AREA EXTENSION AND FIBRE MICROSLIP IN CROSS-SECTION OF YARN AND EVALUATION OF STRENGTH DURING TWISTING

ABSTRACT:

The aim of this paper is to analyze the impact of twist on the strength characteristics of the yarn. In previous studies it is noticed that while twisting and stretching, the cross section of yarn, depends on the fibers located in two zones (stretching and slipping). However, it was unclear that why the quantity of loading fibres vary in between these zones. This research focuses on the important factors such as twist angle which can affect size of stretching and slipping zones and defines the relation of strength with angle of twist.

Investigating the Strain State of Fibers Located on the Helical Line in Extended Yarn

ABSTRACT

In this paper the strain state of fibres located along the helical line in an extended yarn has been investigated. The slippage and mutual displacement of fibers relative to the yarn for analysis of the strain state of fibers in extended yarn are investigated. It is proposed for expression compressive transverse stress G , in our notation, to use the equation supposed in this work (equation 9). The stress strain of fibers in extended yarn is examined and comparison of the stresses between cross-sectional and longitudinal directions is carried out. Increasing the compressive transverse stress of fibers in the centre of yarn by increasing twist angle is found. Also it is noticed that the axial stress strain depend on twist angle of yarn. The results obtained using this relationship are similar to those presented in previous studies.