

Effects of Knitting Variables for Pressure Controlling of Tubular Compression Fabrics

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Abstract : Compression textiles with ergonomic-fit and controllable pressure performance have demonstrated positive effect on prevention and treatment of chronic venous insufficiency (CVI). Well-designed compression textile products contribute to improving user compliance in their daily application. This study explored the effects of multiple knitting variables (yarn-machinery settings) on the physical-mechanical properties and the produced pressure magnitudes of tubular compression fabrics (TCFs) through experimental testing and multiple regression modeling. The results indicated that fabric physical (stitch densities and circumference) and mechanical (tensile) properties were affected by the linear density (yarn diameters) of inlay yarns, which, to some extent, influenced pressure magnitudes of the TCFs. Knitting variables (e.g., feeding velocity of inlay yarns and loop size settings) can alter circumferences and tensile properties of tubular fabrics, respectively, and significantly varied pressure values of the TCFs. This study enhanced the understanding of the effects of knitting factors on pressure controlling of TCFs, thus facilitating dimension and pressure design of compression textiles in future development.

Keywords : laid-in knitted fabric, yarn-machinery settings, pressure magnitudes, quantitative analysis, compression textiles

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