DESIGN OF ELASTIC GARMENTS FOR SPORTS IN CIRCULAR KNITTING

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ABSTRACT

The movements involved in most active sports require a certain level of stretch to compensate the difference between skin's elasticity and the lack of elasticity in conventional fabrics. Elastic textiles can improve the ease of movement of clothing and enhances the ergonomic wear comfort. The use of elastane (spandex) in circular knitting allows the production of fabrics that are molded to the body as a second skin and maintain their modeling without deformation during the product life. There are only few studies on knits behavior and especially about the possibilities of circular machine setup and their consequences in the final product. This study aims to show how, through the use of design of experiments (DOE), it is possible to optimize these adjustments in order to obtain certain characteristics in the final product. Using a 2^2 factorial design, were analyzed and defined the best adjustments of polyamide's LFA (loop length) and elastane's tension to achieve the required level of weight per area, thickness and elongation, with the smallest percentage of elastane.

KEYWORDS: Knitting, Sport Garments, Polyamide, Elastane(Spandex), Design of Experiments