P90. Differentiation of Rigid Elements Used for Knitted Orthopaedic Supports

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Medical textile is one of the most important areas of functional textiles because it is related to human health. Knitted orthopaedic supports are one type of medical textile products, designed and manufactured for a particular part of the body and assigned to compression garments. Fabric for compression garments is usually designed with a stretchable structure and contains elastomeric inlay-yarns to achieve highly stretchable and appropriate compression [1]. Additional rigid elements (fasteners, straps, silicon strips, labels, etc.) are used in knitted supports structure for different purposes. The previous research stated that in the area of low extensions, there is a strong linear dependence between the rigid element relative area and compression generated by the knitted orthopaedic support – compression linearly increases by increasing of the relative area of the rigid element [2]. Rigid elements can be classified into three main groups which include rigid elements used for:

- Medical purposes (elements create function that is relevant to patient health and healing process);
- Wearing comfort (straps, silicon strips, fasteners, etc.; may effect compression not only according to its relative area, but also because of with different force consumer used);
- Branding (labels, tags and logos).

Definitely, additional elements for medical purposes are crucial, cannot be eliminated and the relative area of these elements cannot be reduced significantly. Implication of additional elements used for wearing comfort can be questioned and its relative area may be changed. At least the inferred group of additional elements is the branding type and the case of this type relevance is overt. Moreover, additional rigid elements can significantly affect compression generated by the compression support and can even change the compression class of the product.

Keywords: *knit, orhtopaedicl textile, compression classes.*

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P91. Functionality and Sustainability of Peat Fibre-Based Textile

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Nowadays textile industry has undergone considerable changes because of growing requirements of consumers for more specified and sophisticated products. In the first place came natural fibers, which are characterized by their exceptional ecological properties. Special attention is paid for natural cellulose based fibres. Natural cellulose fibres are recognizable as being from a part of the original plant. Thus the natural cellulose-based peat fibres have now been gradually accepted by textile industry as an alternative to cotton because cotton requires an abundant amount of pesticides to grow [1,2]. Peat fibre is constituent of sheathed cotton grass sedge *Eriophorum vaginatum* growing in bogs and bogy soils. The original vegetation – trees, bushes – gradually perish over the centuries and they become peat. Peat fibres are obtained from the surface of the bog as by-product of energy generation industry because the top layer for energy is not used. The fibres that the peat industry doesn't need can be spun into the yarns, woven or knitted into garments [3]. So, the peat fibres are a by-product (a waste product) of the peat harvesting industry and could be successfully used in the textile industry.

In this study, knitted structures have been developed from new natural and sustainable peat fibres and their combination with widely used woollen, cotton and elastomeric Lycra yarns. The main goal was to investigate an influence of peat fibre nature on physical and mechanical properties such as dimensional stability, air permeability, thermal conductivity, abrasion resistance.

Keywords: *peat, natural fibres, knit, physical properties.*

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