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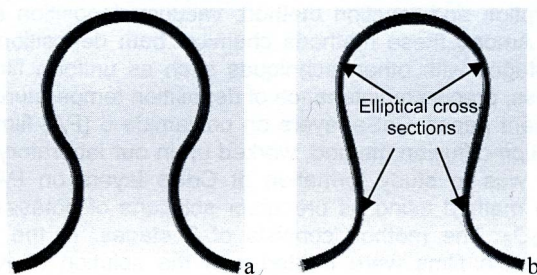


## P94. Analysis of Knitted Composite Reinforcement with Variable Cross-Section Shape

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Knitted fabrics have high degree of deformability and this property is attractive for use them as reinforcement in polymer composites with complex shape [1]. Mechanical properties of composites are determined by reinforcement structure. Most theoretical models for weft knitted fabric assume that yarn cross-section is circular and constant. Real textile structures differ from theoretical models - variability of the internal geometry can be significant. This geometrical variability has its influence on the material parameters.



**Fig. 1.** Weft knitted fabric model: a) yarn cross-section is circular and constant, b) yarn cross-sections shapes are non-constant

The objective of this study is to compare stress distribution in weft knitted fabric loop model with constant circular cross-section and in model with non-constant cross-sectional shape, where cross-sections in two yarn contact zones are elliptical (Fig. 1) due to yarn compression. In this study Leaf-Glaskin model was used for obtaining yarn middle line coordinates. FEM software is used to obtain stress distribution for studied models.

**Keywords:** *weft knitted fabric, composite reinforcement.*

### **References:**

1. Miravete A. (Ed.) 3-D Textile Reinforcements In Composite Materials. CRC Press and Woodhead Publishing Ltd, 1999, 180 p.