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RESEARCH ON THE PILE FABRIC STRUCTURE PARAMETERS USING LOOP MODEL

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With thick and porous structure, pile knitted fabric is very suitable for applications that require thermo-insulation as winter garment [1,2]. The fabric geometrical parameter such as wale space W, course height C, course density, wale density Pn (wales/100mm), loop length (mm) fabric thickness can be used to calculate the product parameters [3]. This paper investigated geometrical parameters of four pile single fabrics with four value of pile loop length of 7.58 mm; 7.88 mm; 8.03 mm and 8.37 mm with pile sinkers high of 2.2mm, 2.5 mm, 2.8 mm, 3.0 mm, the same as reported in research [3, 4]. In this research, for the pile knitted fabric we supposed the fabric thickness was always 2dtotal + d pile but the yarn diameter d was the significant for two kinds of yarn. Moreover, the thickness of the knitted fabric, as its secondary structural parameter, is the results of its primary structural parameters (loop length) and can be easily determined experimentally. The thickness of a knitted fabric is one of the most important parameters for its physiological properties.

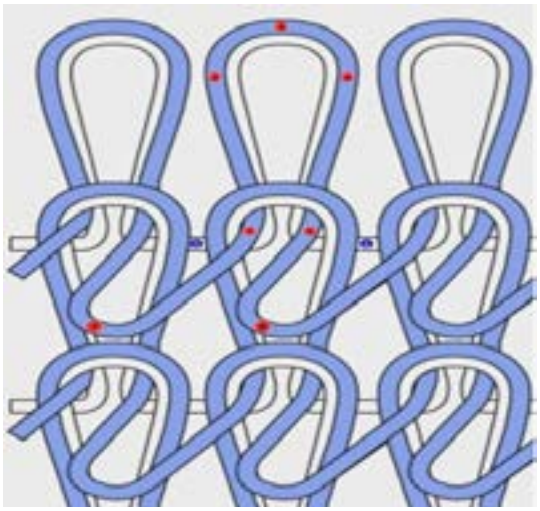

Figure 1: *Geometrical model of pile loop*

Based on the loop length formulary for single jersey fabric (5), the pile loop could be calculated as:

l = 1.57W + 2C +Пd + 2. Pile sinker high

The fabric parameters were theoretical calculated based on proposed geometrical pile model and was experimentally measured. The results showed that the differences between the theoretical and experimental parameters values were between 5% -15 % which suggested the pile loop model proposed can be improved to use for calculation of the pile fabric geometrical parameters for further application.

Keywords: *Loop structure, loop simulation, pile fabric, fabric geometrical parameters*

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