

Study on the Relationship of Knitted Female Underwear Pressure Comfort and Loose Quantity

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Abstract

The underwear fit and pressure comfort is a crucial importance. This paper firstly used the Untouched 3D Body Scanner to scan the 110 young female body, and extracts a total of 17 human body sizes related to underwear structure, in all the directions including the horizontal direction, vertical direction and other direction. Through analyzing the data, this paper focused on that among the horizontal dimensions: waist circumference, abdomen circumference, hip circumference, and the thigh root circumference; Vertical dimension: height, waist high; and other size: lower trunk length is the biggest difference, and the key part that affects the underwear specification. To analyze these measurement results and contrast with the national female underwear shape series standard found that the most common is the intermediate of A shape, at present, so regard the female intermediates as main object of study. Assess this knitting fabric is suitable for the middle of elastic underwear, through the test of fabric gram weight, warp/weft, thickness and elasticity. Moreover, this paper made the zero relaxation prototype with inelastic fabric by utilized vertical cutting and pattern, combined with young women wearing preferences, chose the female low-rise boxer briefs style as the main style of study. On this basis increase to -4 cm relaxation in turn in the Abdominal girth, hip girth and thigh girth, fork reduce 0.5 cm in turn. According to this regular to make five different relaxation knitted female underwear, and invites eight eligible subjects to put on the underwear to complete a series of dynamic testing, at the same time, gives the subjective evaluation timely for each related panties pressure comfort under the condition of different actions. Finally, With local comfortable stress evaluation method to evaluate the pressure when subjective human movement, the biggest impact of the site in turn, is abdominal, back hip, thigh, the bottom fork, based on analyzing the data, found that when abdomen circumference and hip circumference of the loose quantity is -17 cm, thigh circumference is -12 cm, and fork is 13 cm, people who wear this kind of knitted underwear can have the most comfortable feeling.

Keywords: The Relaxation; Pressure Comfort; Women Underwear

1 Preface

At present, China has 1.4 billion people, the female is about 670 million. According to the survey,

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most of the women would buy 4-10 panties every year, therefore, In terms of the underwear market, female underwear has immeasurable potential development. With the society development, the modern female underwear is not only the role of shade and sanitation, but also comfortable and health. But the market not concern this too much.

The loose quantity is one of the important factors of the clothing wearing comfort. Previous studies have shown, the loose quantity related to many factors, including the elementary physiological needs, style, aesthetics, motion etc. Among this, the fabric texture also have close relations, for example, Woven and knitted fabric has obvious differences on the human body normal demand for loose quantity. Woven fabric does not have very good elasticity, so need to add some loose quantity to meet the physiological needs, because of its unique structure, the knitted fabric has good flexibility, negative loose quantity can meet the demand.

The wearing comfort affects not only the wearer's psychological feeling, but also the physical health. Clothing pressure comfort is an important index for evaluating the clothing comfort [1], the human is in motion, underwear contacts with the body directly, that will produce the certain amount of pressure on the body and influence the wearing comfort. The design of relaxation can affect the wearing comfort in dynamic state, and it plays an important role in the version design [2]. Because underwear put in fit, a bigger relaxation will give more comfort on a human body, but it might affect on aesthetic. However, the relaxation is not enough, it will produce large pressure, which affects the human body wearing comfort. So it is important to analyze appropriate relaxation of underwear to the pressure comfort of human body.

2 Research on the Lower Body Size of Young Women

2.1 The Method of Body Measuring

Present, the garment industry adopts two method of body measuring: One is contact measurement, owns to traditional manual measurements that contact to the human body directly. Using flexible rule, caliper, range finder, Angle instrument, Martin section instrument etc. The advantage is Simple and convenient, but the defect is slow and imprecise; the other is Non-contact measurement, through non-contact infrared scanning to measure. The advantage is accurate and rapid, it is conceivable that is more expensive and complex.

2.2 Measurement the Lower Body Size of Young Women

2.2.1 The Equipment of Measuring

Non-contact 3D body scanner is the high-tech human body measurement technology, which is based on the modern optical technology and combined with the information processing technology, electronics, computer vision and computer image applications. At the same time, it can also use computer automatic measurement ability to measure out the basic data of anthropometric measurement conveniently, quickly and automatically through the computer redefining the image information [3]. This experiment uses Non-contact 3D body scanner, in clothing engineering center of Xi'an Polytechnic University, the scanning machine model is JB-3 DLS-BODY. (as Fig. 1)