

Studies on the Heat Keeping Property and Warm/Cool Feeling of Silk Woven Fabric

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The healthy life of human beings depends on the balance between exchange under an environment and the heating capacity within the body .

Therefore, it is very important to study properties of fabrics consisting of clothes, various design and wearing relating to the environment, in order to accomplish more comfortable clothing life.

To solve these problems, it is required to analysis these thermal properties of fabrics in details, based on the human beings -clothes-environment.

The cloth is composition of fibers, air and moisture while its thermal conductivity shows a complex condition which relates with thermal conductivity of these fabric, air and moisture as well as radiation and convection between fibers.

For these reason, there are many studies on the thermal and moisture transport properties of cloth.

This study is to conducted to examine heat keeping property and warm/cool feeling of silk woven fabrics by measuring their thermal and mechanical properties, using KES-F system, by analysising these thermal properties, and by suggesting the relation between these properties.

The summerized results of this study are as follows.

1. The heat keeping rate of silk woven fabrics showed that the fabrics for summer is 7.88%, and one for fall & winter is 11.37%.

And the q_{max} . value of silk woven fabrics appeared that the fabric for summer is $0.1630W/Cm^2$, and one for fall & winter is $0.1293W/Cm^2$. This fact implies that the fabrics for fall & winter provides more warm feeling than one for summer.

2. The porosity and thermal transmittance of silk woven fabrics have negative(-) and positive(+) relations, respectively, with the heat keeping property while with the warm & cool feeling the reverse take place.
3. The warm/cool feeling of silk woven fabrics showed that the larger the surface unevenness, the greater the warm feeling while the more even the surface, the better the cool feeling.
4. The warm/cool feeling of silk woven fabrics has negative(-) correlation with compressional property values.

The greater the compressional recovery rate and energy, the better the warm feeling.

5. The relation between the warm/cool feeling and heat keeping property is based on the following equation.

$$q_{max}. = 0.3215 - 0.0195Hk \quad (r=0.9351)$$