



Abstract

Apparel fabrics need to satisfy human comfort feelings which include physical as well as thermal comfort. It decides the aesthetic value of the cloth. Various test methods are developed to check various fabric properties in isolation. But to assess the fabric performance as a whole, an objective method correlating the properties that contribute to the fabric performance must be evolved.

Dr. F.T.Peirce in 1930 introduced terms such as extensibility, bending rigidity, bending modulus, hardness, density etc to describe fabric low stress properties in numerical values as a measure of feel or handle of cloth. Later many techniques and models are suggested by researchers for evaluation of fabrics comfort characteristic. In 1972 Prof.Suo Kawaba developed KESF-Kawabata's Evaluation system for fabrics which has been widely used world over for objective measurement of fabric handle. This system is based on subjective assessment of fabric by Japanese judges and is found suitable in Japan and several other countries. But for market other than Japan the equations need to be modified.

This project aims at developing a data based computer model for comparing two fabrics for their comfort characteristic. Data of various low stress mechanical and thermal properties of 65/35 Polyester/viscose fabrics are used to develop this expert system. Fabrics are tested using simple procedures and techniques with the instruments available in most technical/research institutes. Some test methods which are not commercially available are developed. Five mechanical comfort factors for hardness, extensibility, surface roughness, fullness and shear

stiffness of fabrics are identified to describe fabric mechanical comfort. Similarly three thermal comfort factors viz. air and moisture permeability, thermal insulation and wicking factors are identified to represent fabric thermal comfort. Fabric over all mechanical as well as thermal comfort value is obtained from these comfort factors using Euclidean Distance concept of mathematic. These factors evaluate fabric comfort objectively. Fabrics are ranked on a scale of zero to one.

To simplify the laborious calculations, a software for fabric comfort (named FabCom) is developed from the empirical equations for the comfort factors. It compares two fabric samples for their mechanical as well as the thermal comfort and ranks them on a scale of zero to 1 for ready reference of their performance character.