CHAPTER 9

DESIGN AND DEVELOPMENT OF BILAYER SOCKS FROM MICROFIBRES

9.1 INTRODUCTION

Socks are worn for protecting the legs from the varied weather condition and also to determine comfort. The socks act as an insulating material and they are manufactured from bulked yarns. The bulked yarns used for the production of socks did not allow the passage of air and moisture through them. With an advent of micro fibres, it was thought that a study of the socks produced from these fibers was needed.

This Chapter deals with the comfort characteristics of socks produced from micro fibre yarns and regular yarns.

9.2 MATERIALS AND METHODS

Micropolyester, micromodal yarns of 0.9 and 1 dtex were procured from a standard mill and used for the study. Details of materials and methods were already discussed in chapter 3.

9.3 RESULTS AND DISCUSSION

The results of, bilayered socks tested for various properties are given in Table 9.1. It is noticed that air permeability of socks produced from micro fibre yarn is lower than that of socks made from regular yarns. This is
due to large number of fibers in the cross section of the yarn which resist the passage of air. Permeability is dependent on pore size, fabric thickness and cover factor of fabrics.

**Table 9.1 Results of bilayered fabrics tested for comfort**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Regular socks</th>
<th>Microfibre socks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areal density(GSM)</td>
<td>214(0.04)</td>
<td>213(0.07)</td>
</tr>
<tr>
<td>Thickness(mm)</td>
<td>0.825(0.01)</td>
<td>0.730*(0.016)</td>
</tr>
<tr>
<td>Air permeability</td>
<td>225(0)</td>
<td>162*(0)</td>
</tr>
<tr>
<td>(m/min/sq.cm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical wicking(mm)</td>
<td>0(0)</td>
<td>3.3*(0.129)</td>
</tr>
<tr>
<td>Moisture vapour</td>
<td>2051.5</td>
<td>3472*</td>
</tr>
<tr>
<td>transmission rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drying rate</td>
<td>375</td>
<td>365</td>
</tr>
</tbody>
</table>

* Values in parantheses indicate standard deviation

Wickability of socks made from micro fibre yarns is good as the micro fibres provide better capillary action than regular yarns. This is an important requirement for socks on the comfort perspective.

It is apparent that the socks made from micro fibers show a better trend than the socks made from regular fiber yarns. This shows that the socks made from micro fibers are breathable and thus prevent the accumulation of sweat in the legs.

The drying rates of both the fabrics are found to be similar which may be due to the hydrophobicity of the core yarns used for the production of socks.

Figures 9.1 - 9.5 show the results of regular and microfibre socks for various comfort properties for regular and microfibre made socks.
Figure 9.1  Area density of regular and microfibre socks

![Area density graph](image1)

* Values in parantheses indicate standard deviation

Figure 9.2  Thickness of regular and microfibre socks

![Thickness graph](image2)

Figure 9.3  Airpermeability of regular and microfibre socks

![Airpermeability graph](image3)
9.4 CONCLUSION

1. The results show that the socks made using micro polyester filament yarn in the core and micro modal staple yarn in the sheath are much better than the socks made using macro denier nylon filament yarn in the core and cotton yarn in the sheath in terms of moisture comfort which one of the sensitive parameters for assessing the comfort.

2. Bilayered knitted fabrics exhibit lower thickness, lower air permeability, higher wickability, higher moisture vapour transmission rate in comparison with normal socks.