fabrics due to their lower fabric weight than the others. These fabrics can provide better thermal comfort during sports activities in the summer season, releasing the increased sweating. However, water vapour permeability is lower for samples WM-8 and WM-7 than for WMK-2, although WMK-2 has higher fabric weight than these two samples. The reason is their PU nano-porous membranes reducing the diffusion rate of water vapour, which results in less water vapour permeability.

Conslusions

In the experiment, different properties of membrane laminated layered fabrics, like hydrostatic resistance, tensile strength, bending rigidity and water vapour permeability were analyzed. From the test results, it is clear that fabric density and compactness influence the hydrostatic resistance and tensile strength properties significantly. Fabric thickness greatly affects the bending rigidity of the fabrics, whereas water vapour permeability is impacted by the fabric weight as well as fabric compactness and the hydrophobic or hydrophilic nature of the membrane. Moreover there is a positive relationship between the hydrostatic resistance and tensile strength properties.

Laminated layered fabrics with higher hydrostatic resistance and better breathability are considered for outdoor sports clothing. Moreover better tensile strength along with low bending rigidity is preferable for users. Fabrics with better water vapour permeability are suitable for summer sports clothing, whereas those with less water vapour permeability can be used for winter sports clothing. Among all the samples investigated, WM-8 has the highest hydrostatic resistance and tensile strength properties. WM-5 and WMK-1 are more water vapour permeable and also have less bending rigidity; moreover their hydrostatic resistance and tensile strength are also quite satisfactory. As a result, these two types of fabrics should be more preferred by users as summer sports outdoor clothing. WMF-3 and WMF-4 fabric samples are suitable as winter sports clothing due to their lower water vapour permeability. However, two layered fabrics can be used as winter sports clothing, adding sufficient lining materials.

Finally it can be said that during the designing of summer or winter sports waterproof breathable laminated fabrics, hydrostatic resistance, mechanical properties and water vapour permeability should be considered to be of great importance for the comfortability of the wearers.

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