

Abstract

Purpose

Fabrics' thermal properties greatly influence human comfort during wear. For this reason, fabrics with optimum thermal properties need to be developed. This paper aims to investigate the effect of weft yarn twist levels on thermal and surface properties of 100 per cent cotton woven fabrics.

Design/methodology/approach

Five types of plain woven cotton fabrics were manufactured using weft yarns with 900, 905, 910, 915 and 920 twists/meter (Tpm). The other parameters of the samples as count, thread density and fabric structures were kept constant. Fabric thermal properties were evaluated by measuring its thermal conductivity, thermal resistance, actual insulation, water permeability, air permeability and wicking ability. The fabric compression and surface properties were also evaluated because they contribute to the overall clothing comfort.

Findings

The results showed that actual insulation and thermal resistance property decreased with an increase in twists/meter of the weft yarn. However, thermal conductivity does not significantly change while fabric compression reduced with an increase in twist as the surface roughness increased.

Originality/value

Comfort is a fundamental requirement in human daily existence, and it is greatly influenced by clothing, which comes in close contact with the human skin. Fabrics' thermal properties greatly influence human comfort during wear. For this reason, fabrics with optimum thermal properties need to be developed.