歩行型腰部柔らかダミーを用いた衣服圧測定方法の確立

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The Establishment of Clothing Pressure Evaluation Method Using the Walking Soft Dummy

by

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ABSTRACT

Clothing pressure evaluation for product development and quality control is primarily performed by methods involving the use of hard dummies in a stationary state. However, such methods do not provide sufficient evaluations if it is assumed that people will be subject to a variety of dynamic effects while wearing the clothing. Therefore, in this study, we developed soft-waisted walking-type dummies to simulate the softness distribution of the human body and examined their potential use in a new method of clothing pressure evaluation.

Two types of long girdles were used as specimens, and the clothing pressure measurements were taken at 11 locations on the waist and leg sections, using an air pack system. Static measurements were taken to examine the stationary upright condition with the legs held together as well as with the legs spread apart, while dynamic measurements were taken with the stride and speed varied in stages for examination.

The trends in the measured values were approximately the same for the soft and hard dummies in the static measurements, although the levels of the measured values differed depending on the measurement locations. Differences in the measured values were observed between the stationary upright position with the legs spread apart and the stationary upright position with the legs held together in locations such as the groin and gluteal fold. The dynamic measurements also indicated that larger strides resulted in greater amplitude of the clothing pressure, and as the speed increased, a constant clothing pressure was applied, which reduced the fluctuation. The fact that time-series variation existed with movements, as described above, implies that it is necessary to change the stationary methods used for clothing pressure evaluation.

要　旨

製品開発や品質管理における衣服圧評価は，静止状態の硬質ダミーを用いる方法が主流である．しかし人が衣服を着用する際，様々な動的な影響を受けており，実際の着用を想定した場合に十分な評価ができているとは言えない．そこで，本研究では私たちがこれまでに開発した，人体の柔らかさ分布に相似した歩行型腰部柔らかダミーを用い，新しい衣服圧測定の可能性を検討した．

試料は，ロングガードル 2 種類，衣服圧測定はエアパック方式を用いることにより，腰部および脚部の 11 箇所を測定した．静的な測定では，立位静止時及び開脚静止時における検討を，動的な測定では，歩幅，速度を変化させ検討を行った．

静的な測定では歩行型腰部柔らかダミーと硬質ダミーとの比較で，部位により測定値のレベルは異なるが，試料間の測定値の傾向は近似していた．前後開脚静止時では，立位静止時と比較して鼠蹊部や臀溝部などの部位において，測定値に差がみられた．また，動的な測定の結果，歩幅が大きくなるにしたがって，衣服圧の振幅が大きくなった．しかし速度が速くなっても動的な変化にともなう一定の衣服圧がかかるため変動が抑えられ小さな変動となった．このように動作時には時系列変化があるため，静止時と異なる考え方をする必要があることが示唆された．