

ERGONOMIC IMPROVEMENT OF WORK CLOTHING FOR SHOP WORKERS

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Thermal discomfort is the most common complaint concerning the indoor climate in shops and stores. This study is based on the fact that clothing has a great potential to improve thermal comfort and minimise unwanted effects of local cooling on workers. The aim was to design a functional work clothing ensemble for shop workers, paying attention to work content and thermal conditions at the workplace.

The design process of the prototype for a new clothing ensemble for female and male shop workers was based on the results of the pilot study. The survey of thermal climate in 13 shops with different heating and ventilating systems was conducted during the winter and summer months, simultaneously with an ergonomic work analysis (especially movement and posture assessment), an inquiry on subjective thermal comfort, and interviews on ordinary work clothing in use, and on proposals and needs for functional and protective properties of a new ensemble.

At head level the air was 18-28 °C in summer and 13-25 °C in winter, and at ankle level 15-27 °C and 4-26 °C, respectively. The coldest workplaces were old, small naturally ventilated stores. The thermal climate of mechanically ventilated stores was stable. The mean estimated metabolic rate of shop workers varied between 70 Wm^{-2} for seated work periods and 125 Wm^{-2} for light activity periods in standing work. Three occupational groups with different work content and the demands set to work clothing were found: cashiers, staff dealing with foodstuffs, and staff dealing with other goods. Thus the work clothing must be easily regulated depending on the work content and thermal conditions, it must be suitable for work done while sitting, standing or walking, it must allow free movement of the upper limbs.

The wear trials were carried out in three different shops (grocery store, supermarket, department store) having a different thermal climate during the first half of 1987. The new set of work clothing was worn by 44 workers for about six months. The functional and thermal properties of the material, the design and fit of the prototypes were assessed with a questionnaire. The follow-up of clothing maintenance was conducted in connection with wear trials. After use in normal work duties further modification of the work clothing was based on the opinions of the workers.

The final ensemble of work clothing for female shop workers consisted of a jacket/skirt, skirt/trousers, wraparound apron and cap, and that for male workers of jacket, trousers, apron and cap. The material is 65/35 0 PE/CO piqué, which proved to be suitable for industrial maintenance.

The results indicate that the functional work clothing offers better thermal comfort also in shop work. The designed clothing ensemble was the most suitable for cashiers. It allows easy movement and the ability to sit comfortably without constriction. To be suitable also for grocery shop assistants, some further modifications should be made in the jackets and in the men's apron.