

## FIELD EVALUATION OF WORK CLOTHING FOR USE IN ARCTIC CLIMATE

A. Pásche, B. Holand and E. Myrseth

SINTEF, Div. Medical Technology

Address for reprints:

SINTEF, Div. Medical Technology  
N 7034 Trondheim-NTH  
Norway

A field evaluation of protective clothing for cold climate was carried out at Spitsbergen in April 1988. The study focused on protective clothing for the main body, head, feet and hands.

The environmental temperatures during the evaluation varied from  $-15$  to  $-34^{\circ}\text{C}$ , with wind velocities from 0 to  $25 \text{ m.s}^{-1}$ .

The activity levels selected for the tests included hard work, light work (walking) and resting. In all tests, the subjects were directly exposed to the environmental conditions.

The results indicated that for shoes/boots, the fit of the footwear was equally important for feet temperatures as was the built-in insulative material of the boots. Any tight fit would cause an effect on blood circulation for the feet and the consequent feet temperature and thermal comfort. Several of the cold climate footwear were found to have a sole totally inadequate for ice and snow surface, and represented in itself a safety hazard.

A general complain about the work clothing used was the insufficient wind resistance of the textile in the outer garment. As a result, a high work activity was required to compensate for the heat loss. A textile with higher wind resistance should be required for work with less energy expenditure.

Several undergarments and combination of undergarments were tested. For higher work activities, an undergarment with good humidity transporting qualities was clearly preferable as the undergarment closest to the skin.

This field evaluation documents the need for further improvements on several areas of protective work clothing to be used in arctic areas, as well as a standardization of sizes of the body clothing and footwear. A considerable variation was found between the products delivered from the different manufacturers.