

# Montane 'Sleeping bag' Product Testing

## Health and Life Sciences: Contract Research case study

Northumbria University's Environmental Chamber Research Group led by Dr Martin Barwood has successfully provided product testing for the leading performance outdoor clothing brand, Montane. Dr Barwood is a member of a larger research team investigating human interaction with protective garments and equipment designed for use in extreme environments including outdoor clothing, survival aids and other ergonomic devices.

This bespoke contract research was organised and conducted at short notice to support Montane at a key stage in their new product development phase. A series of controlled trials were undertaken to evaluate and determine the effect of extreme cold temperatures upon the performance of selected products from their sleeping bag range and in a controlled environment.

At Northumbria University the Department of Sport, Exercise and Rehabilitation boasts significant expertise in the area of Environmental Physiology supported by their state of the art environmental chamber. A group of academic research staff investigate the physiological and psychological responses to environmental extremes from the perspective of sports performance, health, military and occupational performance and to understand the underpinning physiological mechanisms that are stimulated during long term exposure to such stressors.

The environmental chamber enables conditions to be accurately simulated and held under tight control in a laboratory situation. Conditions that can be simulated include:

- **Hot environments:** up to 40°C and 90% RH
- **Cold environments including sub-zero conditions:** 10°C to -20°C
- **High altitude simulation by oxygen filtration:** max height equivalent to 8000 m (i.e. conditions found in the Mount Everest range)
- **Water immersion:** capability to study responses to cold (down to 5°C) and hot water (up to 45°C)
- **Wind chill:** to an extent representative of a range of environments and sports

Deemed a success by management at Montane, Lottie Watkinson (Design & Development Manager) commented:

**"We undertook very useful and informative work in Northumbria's Environmental Chamber to develop and product test a range of sleeping bags in extreme temperatures. We are keen to maintain a link with Northumbria, the Chamber and academic expertise to support the design research and development process of future Montane products"**

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