A warmer future for watersports (w/ Video)

May 19 2010

Watersports enthusiasts will soon be able to surf in colder waters and keep warm for longer, thanks to The National Physical Laboratory (NPL) and UK wetsuit manufacturer, Spartan.

Spartan specialise in wetsuits for the wind sports market. It approached NPL, the UK's measurement institute, to understand the science behind how wetsuits keep people warm, to improve its product design. In particular it wanted to improve its windsurfing wetsuits, which keep windsurfers warm whilst standing on their board.

Spartan and NPL set out to perform detailed measurements of wetsuits' thermal function, using NPL's sophisticated measurement equipment. These measurements help understand how wetsuits work, and therefore allow informed decisions about the most appropriate materials and construction methods.

Following initial laboratory tests to measure the thermal resistance of different wetsuit samples, the team moved on to field tests in windsurfers' natural habitat -the sea and beach. On a chilly March day in Clacton on the Essex coast, Spartan's Mark Minter and John Morgan were joined by pro-windsurfer Chris 'Muzza' Murray to test the wetsuits.

NPL's Dr Richard Dudley and Dr Rob Simpson monitored the windsurfers' body temperatures throughout the trial using wireless temperature sensors taped under the right armpits. A thermal camera was then used to measure each man's temperature, in a variety of wet and windy conditions to simulate the experience of windsurfers.

The tests revealed important insights into wetsuit manufacture. One of the most vital concerned the wetsuits' surface finish. Whilst the finish made no difference in the lab, in the field tests it had a significant effect caused by wind drawing moisture, and therefore heat, away from the surface via wind chill. Wind chill has been recognised for some time, but these measurements provide a detailed understanding of how it works and how wetsuit manufacturers can mitigate its effects.

The tests mean Spartan will be able to make better wetsuits more efficiently, meaning a positive impact on a UK company's ability to compete in a crowded global market.

Mark Minter of Spartan said: "NPL's wetsuit testing really helped understand the technical side of wetsuit design. We are now focused on using the correct materials and fully testing everything before production. Neoprene suppliers send samples with claims as to a material's suitability, rather than objective data about thermal performance. NPL's testing highlighted the need to research the correct material. It has saved us producing whole ranges of suits that would be next to useless for the colder northern European countries we sell to, saving us at least £100,000."

In the longer term the techniques developed could have a huge social impact if this work is extended to other wetsuit manufacturers and neoprene suppliers. Richard Dudley of NPL concludes "millions of people in colder European countries such as the UK take part in activities that require wetsuits, from Scuba diving and Triathlons to Surfing and Windsurfing, to brave chilly waters. Improved materials and construction will mean they can spend more time in the water, and enjoy their sport of choice in much colder conditions than they are currently comfortable doing. This will have an important economic benefit for both wetsuit manufacturers and the watersports industry as a whole."

Provided by National Physical Laboratory