

THE ADEQUACY OF 0.75 CLO INSULATION TO PROTECT AGAINST HYPOTHERMIA AT SEA

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PURPOSE: Thermal protection standards for immersion suits typically require less than 2°C decrease in T_{rectal} after a 6 hour immersion in calm 0-2°C water. However, there is little knowledge about the adequacy of the accepted 0.75 Clo (0.116 W/m²/°C) insulation for hypothermia protection in realistic marine conditions over 6 hours. **METHODS:** 10 male subjects were exposed for 6 hours in a 0.75 clo immersion suit on two occasions: in calm circulated 1.0°C water with 19.9°C calm air (CC), and in 1.0°C water, 15-30 cm waves, with 1.0°C air and 18-25 km/hr wind (WW). **RESULTS:** Over the immersion period, the increase in heat flow (HF) was 36% higher during WW (91.4±5.6 W/m²) than CC (58.2±2.7 W/m²) and metabolic rate (MR) increased 60% more during WW (105±38 W/m²) than CC (42±29 W/m²) (p<0.05). There was no significant difference in the decrease in T_{rectal} between WW (0.98±0.54°C) and CC (1.24±0.54°C) (p>0.05). **CONCLUSION:** This study showed that immersion suits with 0.75 clo insulation worn in realistic marine conditions for 6 hours can limit the HF to a level that MR could accommodate, resulting in less than 2°C decrease in T_{rectal} . Immersion suits with 0.75 Clo would be considered adequate to protect against hypothermia at sea.