ASSESSMENT OF THE PERFORMANCE OF AGENTS USED TO INCREASE GRIP IN ROCK CLIMBING

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ABSTRACT
A finger friction test was developed to test the performance of chalk and liquid chalk in dry conditions and conditions simulating sweaty hands. This was compared with data obtained without the use of friction modifiers. These friction modifiers were chalk and liquid chalk. They were tested on four different rock samples and at four different forces (5, 10, 15 and 20N). These were limestone, fine grained sandstone, coarse grained sandstone and gritstone (all commonly found in the Peak District near Sheffield where climbing is extremely popular). A small amount of testing was also done on the effect of a range of skin moisture levels in the testing finger.

It was found in dry conditions the addition of chalk and liquid chalk had no negative effect on the coefficient of friction, with a possible slight improvement at forces higher than 10N. This was also seen at forces of 10N and below on rock samples with higher roughness. At low force and roughness, chalk was shown to have a negative effect on the coefficient of friction. In tests with moisture levels simulating sweaty hands, chalk and liquid chalk improved the coefficient of friction at all forces and rock types tested. There was no clear difference between the performance of chalk and liquid chalk in terms of their effect on the coefficient of friction. These results support the use of chalk and liquid chalk in rock climbing. A moisture curve was obtained that suggests a slight addition of moisture would improve the coefficient of friction but results also suggest it would be difficult to obtain and maintain with current friction modifiers.