

Abstract

Title

The impact of selected nodes on strength of flat slings under static load

Aims

The aim of study is to assess the strength of flat sewn loops under static loading and impact of nodes to reduce their strength.

Method

The study is designed as a two-factor experiment, where is examined the effect of knots used to decrease the nominal strength of two types of slings. Measurements were performed on a horizontal tear tester. Selected slings materials were dynnema, polyamide and the most frequently used nodes. (UIAA, eight nod, nine nod).

Results

Greater strength reached the loop material Polyamide 26.0 ± 1.1 kN and strength in the cross-section of 1.3 kN to 1mm^2 . Second sling Dyneema achieved strength of 25.1 ± 0.9 kN and strength in the cross-section of 1.3 kN to 1mm^2 . At least polyamide sling material decreased the strength of UIAA knot. Sling broke at a tensile strength of 17.4 ± 0.7 kN. At Dyneema it was the eight knot with values of 12.2 ± 0.8 kN.

Conclusion

For use of combination with the slings and nodes we could recommend polyamide, where the node decreases less than the nominal strength of Dyneema.

Key word

Mountaineering, sport climbing, Dyneema, polyamide, tear test