

Strength of V-Thread versus A-Thread Ice Anchors

Testing by others has shown a new configuration of the traditional V-thread ice anchor (the V-thread is also known as the Abalakov anchor) to be stronger than the traditional configuration. In the new configuration the legs of the V in the ice are aligned with the direction of pull, instead of perpendicular to direction of pull as with the traditional V-thread. This new alignment has been called the A-thread anchor. Seattle Mountain Rescue (SMR) tested the strength of both anchor configurations in melting glacier ice because these ice conditions frequently occur in the area served by SMR. Both V-thread and A-thread anchors were pulled to failure. When properly constructed and using 1" tubular webbing, the minimum breaking strength of A-thread anchors was 12% greater than comparable V-thread anchors. When anchors were located in apparently solid ice and holes were drilled with a 17 cm (6 ¾ inch) ice screw, A-thread anchors had a minimum breaking strength of 16.9 kN (3800 pounds), and V-thread anchors had a minimum breaking strength of 15.1 kN (3400 pounds). When a longer ice screw was used to make the holes the strength of the webbing was the limiting factor, and the webbing broke before the ice broke. This research included tests of questionable anchors, including one test each of an anchor (a) placed on an ice bulge, on (b) white colored ice that was possibly rotten ice, and (c) using 8 mm perlon instead of 1" tubular webbing. Even these sub-optimal quality anchors had at least 10 kN (2250 pound) breaking strength. In this testing, no single anchor had the 20 kN (4500 pound) minimum breaking strength desired for SMR to classify an anchor as a full strength rescue anchor. All anchors tested had at least 10 kN breaking strength, so two anchors ganged together in parallel should give at least 20 kN strength.