

Tensile Testing

The Kevlar string was tested using a tensile test. Using this data, the stress and strain of the string was calculated. This test was performed on two different occasions using two different types of knots. The first was performed using a standard knot while the second was done using a fishing line knot. For each different knot, three specimens were tested. Figures (1), (2), and (3) show the stress strain curves for the standard knot.

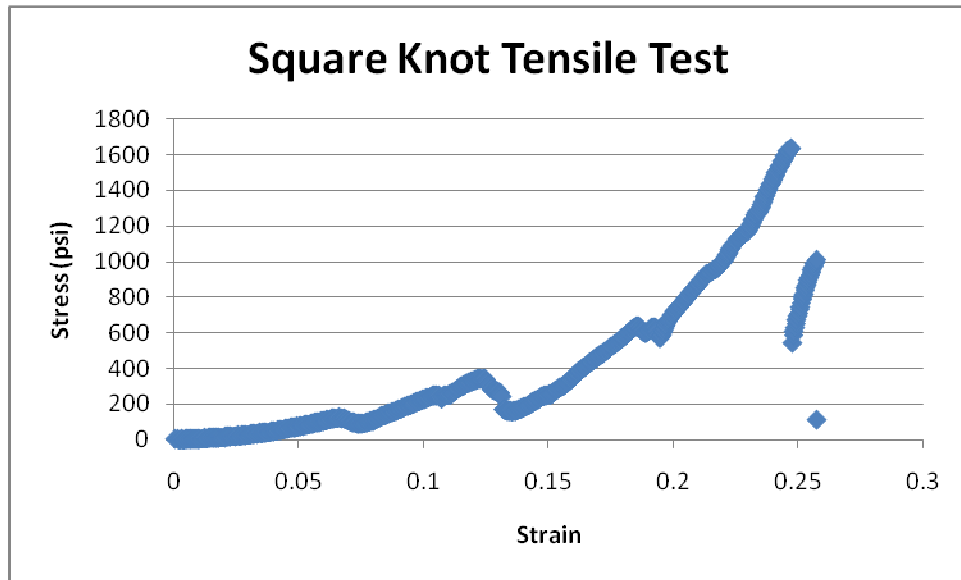


Figure 1: Tensile test with standard knot. Specimen Length: 3.75 in

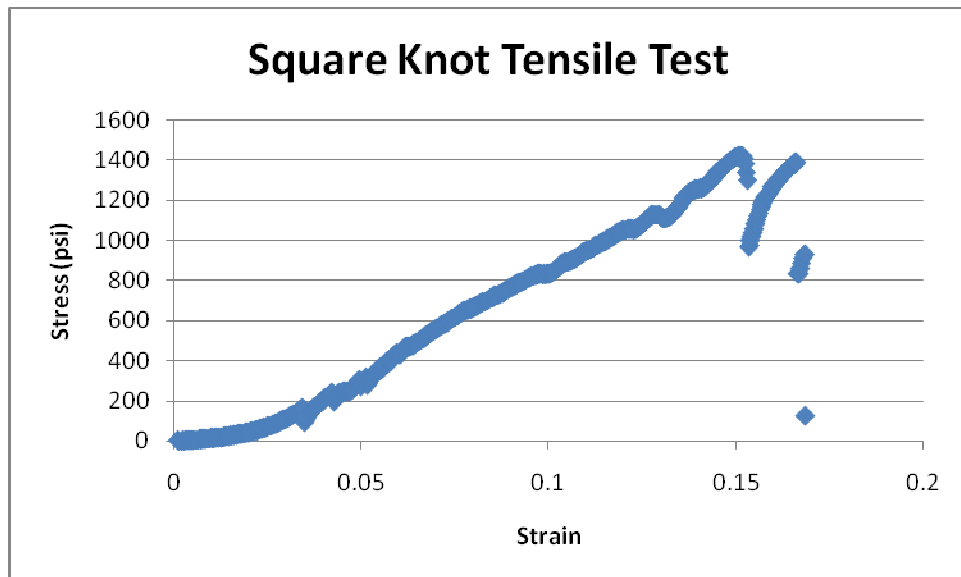


Figure 2: Tensile test with standard knot. Specimen Length: 4.35 in

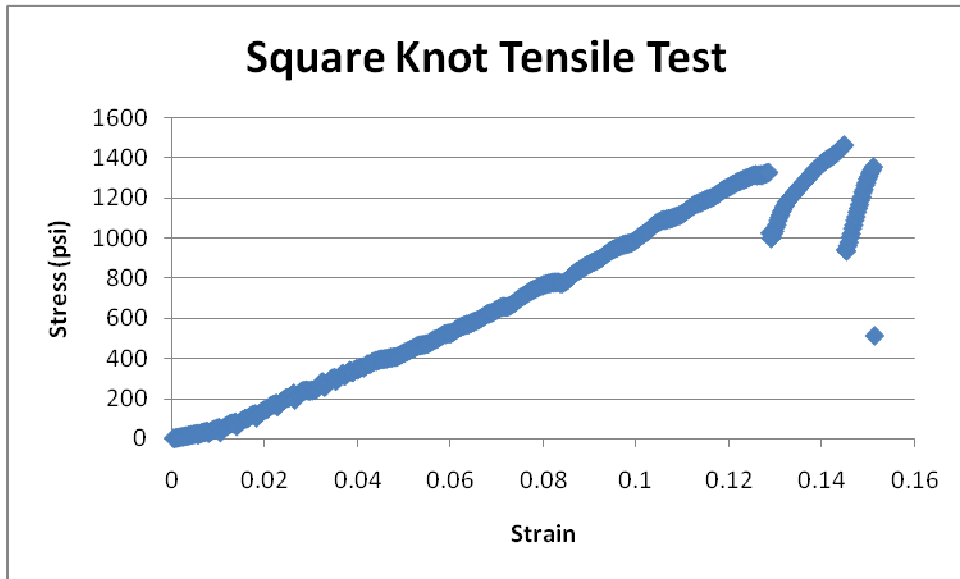


Figure 3: Tensile Test with standard knot. Specimen length: 5.3 in

The average maximum load for the standard knots is 94.167 pounds.

Figures (4), (5), (6) are the stress strain curves for the fishing line knot.

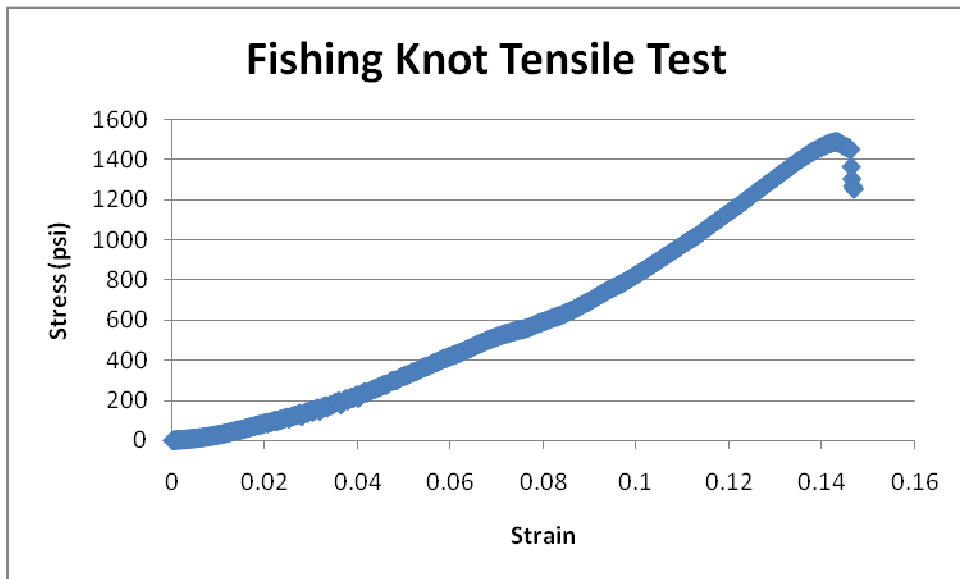


Figure 4: Tensile test with fishing knot. Specimen length: 4.41 inches

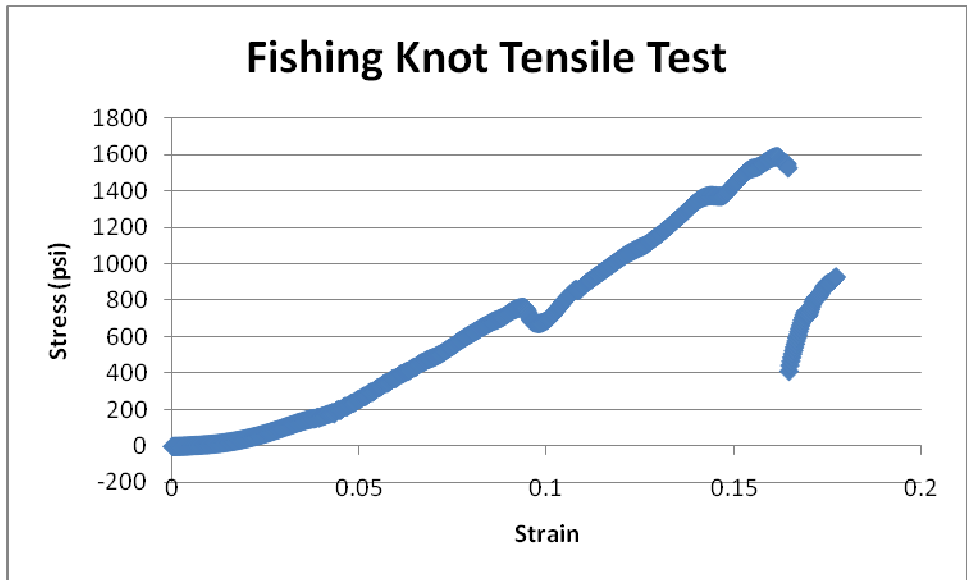


Figure 5: Tensile test with fishing knot. Specimen length: 5.6 inches

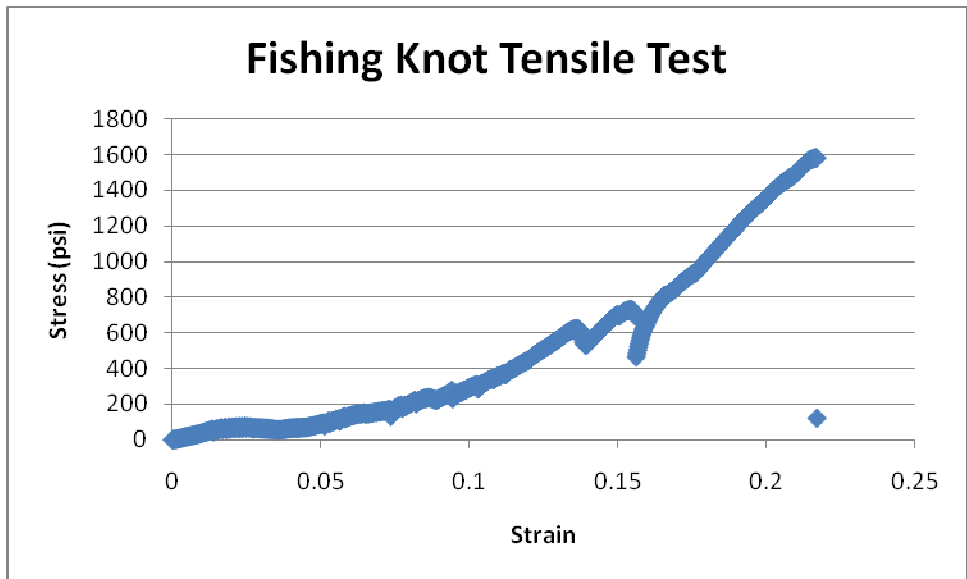


Figure 6: Tensile test with fishing knot. Specimen Length: 5.2 inches

The average breaking load for the fishing knot is 96.3 pounds.

The difference between the two knots is not significant, however, because the average breaking load was slightly higher with the square knot. The square knot is used for the cable connections on each of the fingers.