

Nick Daly
Hot Line

The purpose of this experiment was to investigate the effect of thermal energy on monofilament fishing line. It was hypothesized that thermal energy would degrade the chemical bonds between molecules and decrease the force necessary to break the monofilament fishing line. The initial idea was to determine if high summer temperatures in automobiles had an effect on the strength of fishing line.

Two spools of four-pound test monofilament line were heated in an oven for one hour each at 40° C and 50° C. Another spool was not heated and served as the control. Each of the heated spools was tested in ten trials. Fifty-centimeter sections of unknotted monofilament were attached to a computer interfaced force probe and pulled at a uniform rate until the line broke. A computer recorded and graphed the force data. The forces of breaking strengths at each temperature were graphed and averaged.

The average force required to break the lines were 29.49 Newtons for unheated, 28.61 Newtons for 40° C, and 28.36 Newtons for 50° C.

The results proved the hypothesis to be correct. Monofilament fishing line exposed to higher temperatures, showed a decrease in the force necessary to break the line. The average forces required to break the monofilament lines exposed to different temperatures were not large and further testing is recommended.