

How Are Your Knots Doing?

Landing your finest trophy trout may depend on the quality of the knots on the terminal end of your leader. Moreover, your best knot may suffer from variables outside of your control, so be informed.

We have all read in advertisements about leader and tippet material knot strength being the greatest or the strongest. However, no one ever tells you “**by what standard their claim was measured**”. Over the years the Atlanta Fly Fishing School has taken the time to make very careful and accurate measurements of various knots and tippet materials when tested for tensile strength. These measurements are made on a calibrated Instron tensile testing machine at Georgia Tech that provides accurate and consistent test results.

This series of tests were made to investigate the effect of moisture ingress on the knot strength for three popular tippet materials. The tippet materials were Orvis, RIO and Frog Hair and the knots were a triple surgeons and a five turn improved clinch knot. All knots were carefully tied, lubricated and cinched tight (tag ends not trimmed close) and tested both wet and dry. The wet nylon tippets were immersed in water for 4 hours prior to tensile testing.

The advertised and measured specifications for the tippet materials were as follows:

	<u>Tensile strength (lbs.)</u>	<u>OD (in.)</u>	<u>Measured * (Avg. lbs.)</u>	<u>Measured OD (in.)</u>
Orvis	4.75	.006	3.99	.0061
RIO	5.00	.006	4.99	.0060
Frog Hair	4.90	.006	5.24	.0065

** Average of three tests*

The data from these tests is graphically shown below.

	Dry Imp. Clinch Knot	Dry Surgeons Knot	Wet Imp. Clinch Knot	Wet Surgeons Knot
ORVIS	81%	57%	68%	56%
RIO	70%	78%	59%	71%
FROG HAIR	79%	76%	79%	80%

Make your own conclusions, however notice that the expected reduction in wet tensile strength was only about 10% for Orvis and RIO and virtually unchanged with Frog Hair. In the past we believed that moisture ingress into nylon would result in a reduction of knot strength by approximately 20%. It may be that subjecting the nylon to longer times beyond 4 hours would cause the knot strength to reduce further, but the 4 hour time seems more realistic for most fishing conditions. Repeating the entire testing sequence for times beyond 4 hours would mean twice the cost, so we will stick with 4 hours for now.

I mentioned above that the knots were cinched up tight and the tag ends were not trimmed close. If you want maximum strength from your knots, leave them hairy. Otherwise, as the knot is stretched the tag end(s) will pull into the knot and slip to unravel. This is quite evident when the knots are video recorded during pulls.

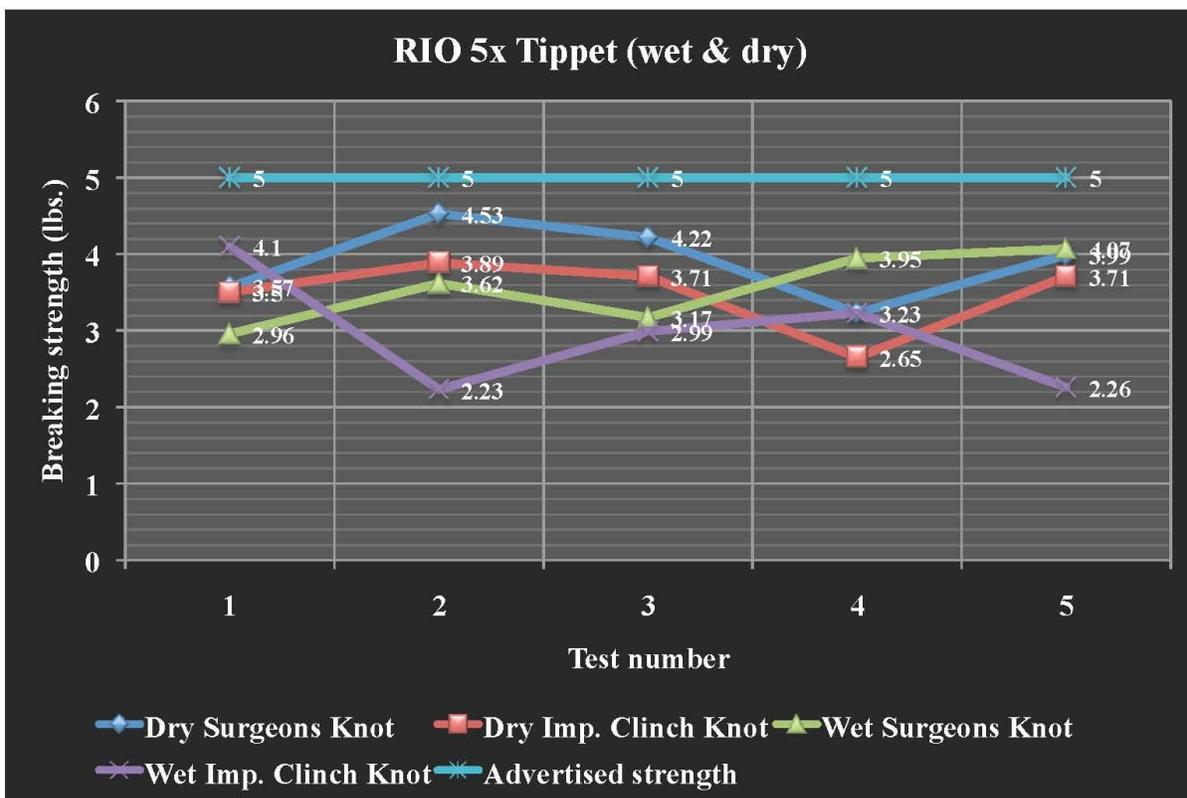
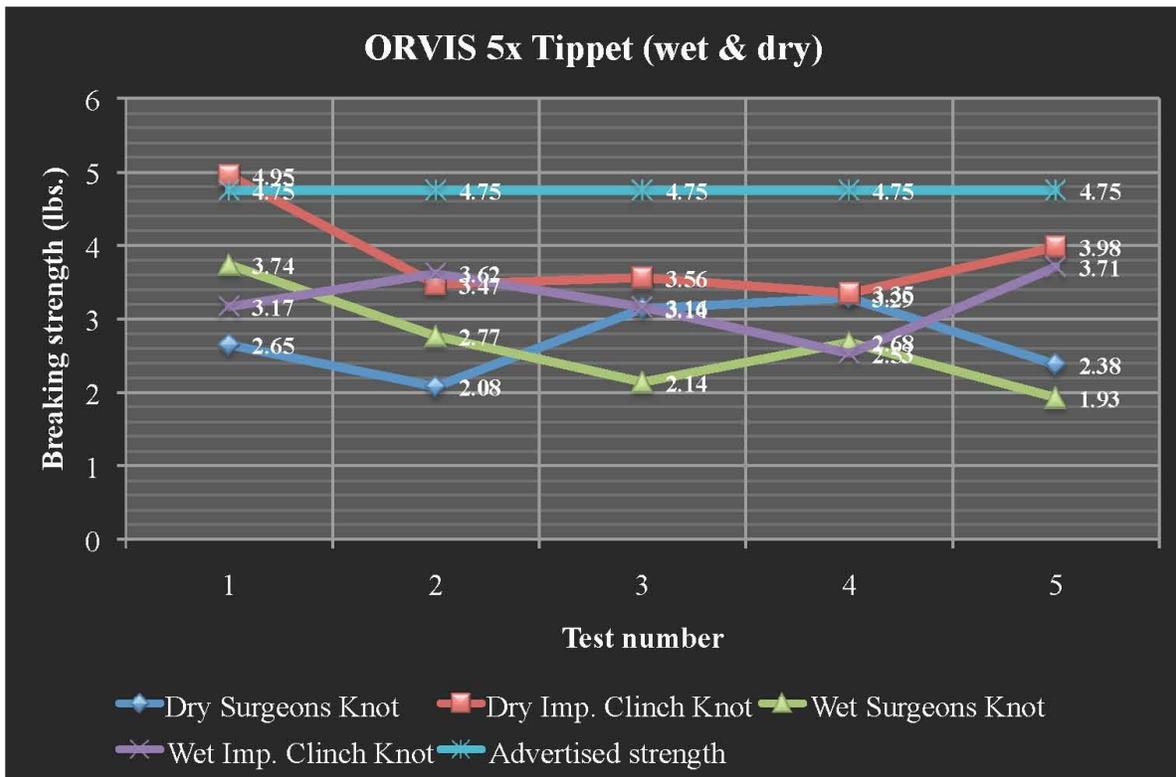
Lastly, a statistician would challenge these results, however these tests show a clear trend and the tensile tests were very consistent. As Scott Swartz would say” **It’s just fishing**”so we will accept the data as is and learn from it.

[Orvis and Rio Tippet Data](#)

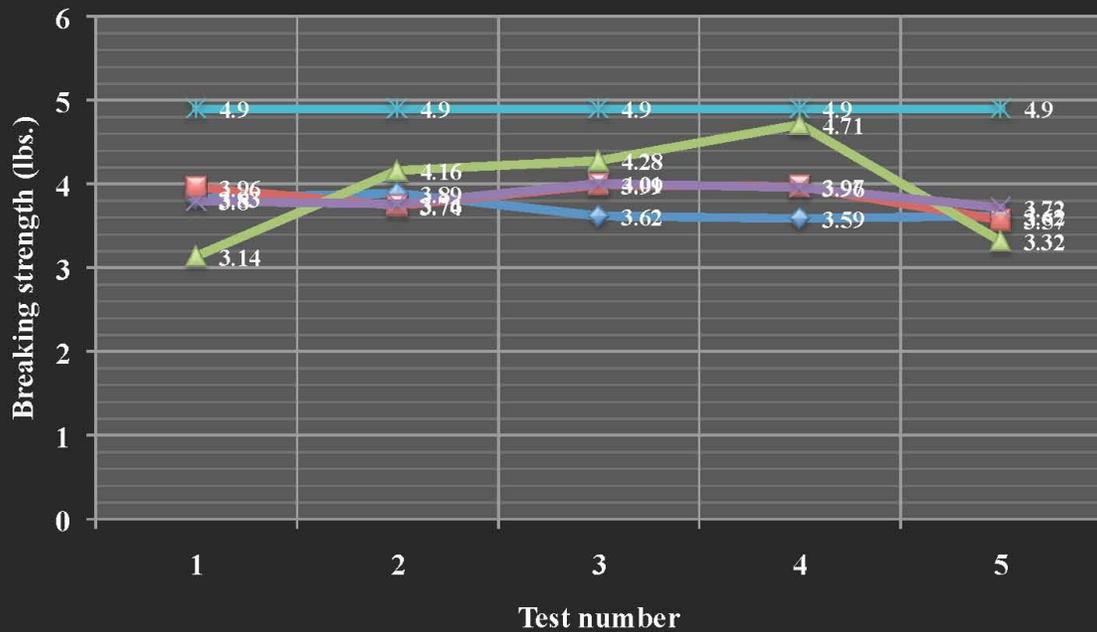
[Frog Hair Tippet Data](#)

Mack Martin





FROG HAIR 5x Tippet (wet & dry)



- ◆ Dry Surgeons Knot
- Dry Imp. Clinch Knot
- ▲ Wet Surgeons Knot
- ✕ Wet Imp. Clinch Knot
- ✱ Advertised strength