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Deadlift Capacity

Is a blank stronger in one direction than another? Does building on a particular axis result in a more durable fishing rod? We decided to find out.

Fishing rod blanks are designed to be cast and fished on more than a single axis. Casts are made overhead, sidearm and even underhand in some instances. None of us can count on a fish sounding directly underneath a rod. They're apt to swim out, off to the side, or down as they attempt to escape from the device that has ensnared them. Therefore a rod blank that is somehow deficient in some respect once it's cast or fished off a single specific axis isn't going to be much of a fishing tool.

The fact is, rod blanks are designed to be equally proficient on all axis, or at least as much as possible. In the real world, and owing to the process involved in making rod blanks, there are certain manufacturing anomalies that prevent the exact same performance characteristics being displayed on each axis. Much of this is due to the fact that the wall thickness of most rod blanks isn't exactly the same all the way around the blank. Nor is the wall thickness the same all along any particular axis.

When a rod blank is oriented in such a way that the majority of the thickest wall is on the compression side of the flex, the blank will exhibit its maximum deadlift capacity. When the blank is oriented so that the majority of the thinnest wall is on the compression side of the flex, the blank will exhibit it's minimum deadlift capability. The former is generally along the straightest axis while the latter is generally along what most rod builders refer to as the "effective spine." And it should be remembered that these two axis are rarely if ever 180 degrees opposite each other.

On a good quality rod blank of sound design and construction, the difference in deadlift capability between these two axis should be reasonably slight. So slight, that any concern over the best orientation should be of no practical concern. But is it? We decided to find out.

Due to the amount of hand labor involved, it is impossible to produce two rod blanks which are absolutely verbatim in all aspects of construction. Furthermore, it is impossible to break the same rod blank twice. Therefore, in order to arrive at the maximum deadlifting capacity for any particular model, the best anyone can do is arrange to test (break) enough of the same model and batch to arrive at what can be considered the typical limit for the typical model of that blank. We were limited to 50 blanks of the same model and batch, and therefore limited to 25 blanks for each of the two deadlift capacity tests. Generally, 25 test samples is not considered enough to provide any sort of empirical data. However, due to the very close results from both groups, we felt the overall outcome would not likely have been affected by the addition of many more test samples.

The test/measurement was set up in the following fashion. Keep in mind that we were not seeking an average - rather we were seeking the typical deadlift capability of the stiffest and softest axis, for a typical model of

a specific blank. Therefore, the high and low for each testing batch were thrown out so as not to include any manufacturing or material aberrations that would skew what should be considered typical for the model. Such aberrations did not, however, appear to any great degree.

Table A

The first 25 blanks were deeply flexed and the softest axis (effective spine) located. The blanks were then oriented so that the applied load was directly in line with that softest axis. Beginning with 20 lbs of load via a bucket filled with water, additional load was applied by adding water to the bucket in increments of a 10ths of an ounce. If the blank withstood the load, that number was recorded. At the point where the blank failed, the last recorded number was listed as the maximum deadlift capability of that particular blank. Typical failure for this group was realized at 22.5 pounds.

Table B

The second group of 25 blanks were flexed and the stiffest axis located and marked. These blanks were then oriented so that the applied load was directly in line with that stiffest axis. Beginning with the same 20 lbs of load via a bucket filled with water, additional load was applied by adding water to the bucket in increments of 10ths of an ounce. At the point where the blank failed, the last recorded load weight was listed as the maximum deadlift capability of that particular blank. Typical failure for this group was realized at 23.7 pounds.

Lesson

The two blank groups in our tests exhibited less than a 6% difference in typical deadlift capacity. Additional tests with other blank models would be required before we could state that this figure would be true across the board for all blank models and types. It may not be, although it is almost certain that some difference would be recorded in all cases.

From a purely technical standpoint, it is therefore reasonable to state that a rod built on stiffest/straightest axis has a greater deadlift capacity than a rod built on the effective spine. The idea that rods built off-spine will fail sooner than rods built on the spine is incorrect. In fact, exactly the opposite is true. Having the cumulative thicker wall predominantly on the compression side of any blank flex results in greater lifting capacity before failure.

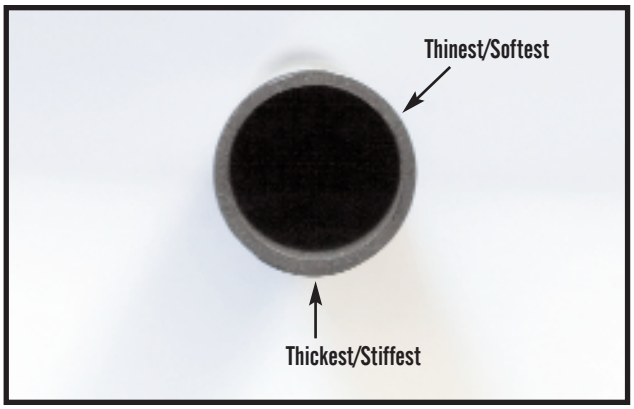
So does the slight difference between having the stiffest or softest axis on the compression side make any practical difference to the rod builder or angler? Considering that few styles of fishing allow for casting and fighting on a single axis, any great concern over blank orientation would appear unwarranted. However, the reader is left to draw his or her own conclusions as needed for their personal requirements. ✍

Table A

Sample #	Capacity (lbs)
1	22.5
2	22.3
3	22.0*
4	22.5
5	22.6
6	22.5
7	22.7
8	22.4
9	22.6
10	22.5
11	22.6
12	22.6
13	22.5
14	22.6
15	22.6
16	22.5
17	22.7
18	22.5
19	22.5
20	22.4
21	22.6
22	22.4
23	22.4
24	22.3
25	22.9*
Typical	22.5

Table B

Sample #	Capacity (lbs)
1	23.6
2	22.8*
3	23.9
4	24.1*
5	23.8
6	23.7
7	23.4
8	23.6
9	23.8
10	23.6
11	23.7
12	23.9
13	23.5
14	23.6
15	23.5
16	23.4
17	23.7
18	23.4
19	23.8
20	23.8
21	23.9
22	23.5
23	23.7
24	23.9
25	23.8
Typical	23.7



Wall thickness around the circumference of a rod blank is not verbatim. This anomaly is caused by the process of wrapping a sheet of material (prepeg) around a tapered mandrel. It can also be influenced by the sanding process that takes place during blank stripping and finishing.

Nor is wall thickness consistent from tip to butt along any particular axis. There is a cumulative effect - whichever axis places the greatest amount of material on the compression side of the flex, will be the stiffest/strongest axis. Whichever axis places the least amount of material on the compression side of the flex, will be the softest/weakest axis (spine).

Note that the stiffest and softest axis on a blank are rarely 180 degrees opposite each other.