Navtec Rod Rigging Service

The question of how long does a Navtec rod rigging system lasts is not an easy one to answer because there are many variables that can come into play. The major factors to consider are:

1. What loads are put on each of the pieces of rod in comparison to each piece of rod's breaking strength;
2. The sailing conditions in which that the boat has predominantly sailed;
3. The amount of care and maintenance that has been given to the rigging;
4. The amount of time and/or miles the boat has been in service;
5. The severity of the marine environment the particular boat has experienced (fresh vs. salt and temperate vs. tropical).

The sizes of the shrouds and stays used on each boat are picked by either the yacht designer, the mast builder or possibly by the rigger who installed and headed it. A racing boat tends to use relatively smaller rod sizes to keep the weight and windage down, which will shorten the rod's life since the maximum normal sailing loads may approach 50% of the breaking strength of the rod. A cruising boat tends to have a higher safety factor when the rod sizes are chosen so that the loads would only be 15-25% of the breaking strength at maximum normal sailing conditions. Another factor that makes any prediction of rigging life harder is the fact that rigging costs invariably come into play when sizing choices are made. Smaller rod sizes for a given application yield shorter rod life, as the safety factors involved are reduced.

If the boat has been predominantly sailed in heavy air conditions, the life of the rod will be shorter than if the boat was sailed in lighter wind conditions or sailed very infrequently. The higher the rigging is stressed on a regular basis, the shorter its life span will be. An analogy: a car's engine won't last as long if it is continually revved up to the red line.

If the rigging has been periodically checked, the end fittings have been rinsed with fresh water, and general care and maintenance have been employed, it will last longer. For example, a turnbuckle can build up corrosion so that it won't turn, or a spreader bend if left covered in leather or tape can eventually corrode the spreader or the spreader bend. Basic maintenance can go a long way in extending the rigging's life.
The miles the boat has sailed and type of marine climate are also factors in predicting the remaining life of the rigging. It has been observed that corrosion rates are significantly higher in tropical climates; and with use, any rigging will eventually deteriorate and wear out.

With all the factors listed above, it is clear that there are many variables that must be considered to determine the life of the rod. As a general rule, Navtec uses a figure of 40,000 sailing miles as a time when a thorough inspection should be done. This would include inspection of all the rod heads and end fittings. If any of the heads are cracked or worn, the rod should at least be reheaded. That doesn't mean that the rod itself would need to be replaced; that would depend on whether the turnbuckles had enough stroke to compensate for a shorter piece of rod. In a good installation, the rod will typically last significantly longer than the heads on the end of the rod.

After a thorough inspection with no problems found, depending on the installation, it may be reasonable to expect the rod to last another 40,000 miles. However, prudence would dictate what should be done. If the boat is going to be used for just local day sailing, you could make frequent inspections and perform repairs as soon as they were needed. But if the boat is going to do a long ocean passage or an extended cruise, it would be smarter to rehead or replace the rod prior to departure.

One item that Navtec does recommend replacing after 10 years of use or 40,000 miles (whichever comes first) is the turnbuckle screws. With the stress concentrations due to the threads, cracks could be forming that may not be noticed until they fail. The screws may last for many additional years, but it is much cheaper to replace a few rigging screws than to replace a mast and all of the rigging.

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What should I look for when inspecting my rigging?

Cracks in rigging components, especially cracks that are orientated transverse to the load are a sign of impending failure. Cracks can be found using visual inspection, a magnifier, or by dye penetrate testing. X-ray testing, eddy current testing, ultrasonic testing and other professional methods can be used.

For visual inspection, the rod or fittings must be cleaned or polished to expose the cracks. Rusty areas frequently indicate cracks underneath. In addition to cracks, you should look for corrosion, pitting and rust. Any areas showing discoloration or potential corrosion should be thoroughly cleaned and inspected. If any evidence of corrosion remains after this cleaning, please consult an authorized Navtec rigger. Pitting and/or corrosion could require reheading or replacement of the rod or replacement of the fitting.

Alignment of the rod and fittings to the load is very important to give good life of rod (or wire or other) rigging. Misalignment of fittings, caused by interference or bends in the rod, should be checked. Kinks or bends in the rod result in increased local stress and dramatically reduce the life of the rod. If a fitting or rod has operated in a bent, kinked or misaligned condition, it should be replaced, as the damage due to cycling cannot be undone. If a rod is bent and then straightened before it is used again, depending on the severity of the bend, it will frequently provide normal life. This is a judgment call and the Navtec Engineering Department should be consulted. Depending on the size and use of the yacht it is frequently wise to have the rig inspected by a professional annually.

Contact Navtec or Sailtec for further information.