

There are a variety of terms to describe propeller characteristics as well as performance attributes. It is important that you have a good understanding of them, the most relevant of which are listed below.

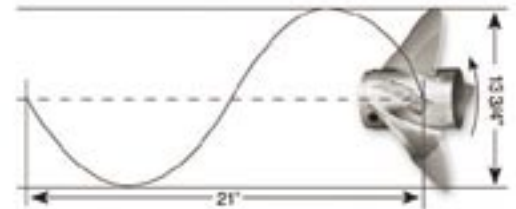
Diameter

Diameter is the distance across the circle made by the blade tips as the propeller rotates. Within a given propeller line, the diameter usually increases for propellers used on slower boats and decreases for faster boats. If all other variables remain constant, diameter will increase as power increases; diameter will increase as propeller RPM decreases (slower powerhead or engine speed and/or more gear reduction); and diameter should increase as propeller surfacing increases.



Pitch

Pitch is the distance that a propeller would move in one revolution if it were moving through a soft solid, like a screw in wood. When a propeller is identified as 13 ³/₄ x 21, it has a 13 ³/₄" (35cm) diameter with 21" (53 cm) of pitch. Theoretically, this propeller would move forward 21" in one revolution. Pitch is rather like another set of gears. For a given engine that wants to run at a given RPM, the faster the boat can go the higher pitch you need.



Rake

Rake is the degree to which the propeller blade is oriented in relation to the prop hub. Basic propellers for outboard engines and stern drives commonly have around 15° of rake. Higher-raked (high performance) propellers often have progressive rake which may go as high as 300 at the blade tip.

A higher rake angle generally improves the ability of the propeller to operate in a cavitating or ventilating situation, such as when the blades break the water's surface. On lighter, faster boats with a higher engine or drive transom height, higher rake often will increase performance by holding the bow of the boat higher, resulting in higher boat speed due to less hull drag. However, with some very light, fast boats, higher rake can cause too much bow lift, making these boats more flighty or less stable, in which case a more moderately raked propeller would be a better choice.



Number of blades

A single-blade propeller would be the most efficient - if the vibration could be tolerated. So, to get an acceptable level of balance with much less vibration, a two-bladed propeller, practically speaking, is the most efficient. As blades are added, efficiency decreases, but so does the vibration level. Most propellers are made with three blades as a compromise for vibration, convenient size, efficiency and cost. The efficiency difference between a two and a three-bladed propeller is considered less significant than the vibrational difference. Nearly all racing propellers are presently either three or four-bladed.



Always carry a spare prop

Don't let a damaged prop ruin your day. Always keep a spare prop on board.