

# In Search of Stability

Today's marine-stabilization technology provides a better ride for all aboard.

We've all been there. You head out on the water for a memorable day with family and friends, but it becomes memorable for all the wrong reasons. You're battling lumpy or even rough seas. Dishes clatter in the cupboard. Cups spill, and snacks go airborne. Someone takes a tumble — or even worse, seasickness strikes.

Once that happens, it's game over. Other than abandoning ship (which may seem perfectly reasonable in that moment), the only lasting remedy for seasickness is an immediate return to shore.

But it doesn't have to be that way. Today's marine-stabilization technology seems almost magical in its ability to reduce that nausea-inducing rocking and rolling, and to provide a more comfortable ride for all aboard. Best of all, it's readily available, whether you are in the market for a new boat or are considering a refit project.

## Gyro stabilization

In the decade since it introduced its first unit in March 2008, the Seakeeper name has become synonymous with gyro stabilization. With this system, a horizontal flywheel spins in a vacuum-enclosed sphere at speeds up to 9,700 rpm or 557 mph. The gyro tilts fore and aft when the boat rolls, producing a powerful gyroscopic torque to port and starboard that counteracts the rolling motion.

According to Seakeeper's Kelsey Albina, this technology can be installed virtually anywhere amidships-aft on boats 27 feet and up, and it has no protruding appendages that affect the boat's external structure.

"The smallest unit can fit easily in the leaning post on a center console, or it can be attached to the hull," Albina explains, also noting that it does not have to be on the centerline.

The unit can take as little as 25 to 30 minutes to spool up, depending on the model — enough time to load the boat, disconnect from shore power, and ready the lines for departure — and then you can unlock the gyro. From that point, Seakeeper's smart technology takes over, allowing it to read and react to sea conditions instantaneously. This is true at all speeds, in all sea conditions, and even at anchor.

"We don't want to just reduce boat roll, we aim to eliminate it altogether," Albina says. "By eliminating up to 95 percent of boat roll, we're providing a near land-like experience. People didn't think we could hit those numbers, and now customer demand has reached a point where builders are specifically designing hulls to accommodate Seakeeper as a standard feature or an available option. It's been exciting to see that change in mindset."

Zipwake Interceptor 450S V system installed on a boat.



In fact, a full quarter of Seakeeper's business now involves refits. Interested boaters simply need to determine which unit(s) will work best with their boats.

A larger recreational yacht or commercial vessel, for example, may need to incorporate multiple units, and a smaller boat may need a larger unit than anticipated based on the vessel's weight. Fortunately, because the units can go almost anywhere, most boats can accommodate them.

Albina acknowledges that some boaters are concerned about additional weight, but she advises that the company hasn't found any considerable post-installation differences in speed or fuel efficiency.

"When you think about it, a Sea Ray 590 is roughly 70,000 pounds," Albina says. "The Seakeeper 9's weight amounts to less than 2 percent of that, so it's very doable. It's such a small percentage of a boat's overall weight."

Boaters also will be interested to note that electrical requirements for a Seakeeper system are minimal. The smallest two units run on 12V DC battery power, while the larger ones will require a generator.

Admittedly, due to both weight and cost, these units aren't a viable possibility for boats under 27 feet. At least, not yet.

"We've set a lofty goal," Albina says. "We're working on developing the technology we need to deliver lighter units at a lower price point. Our vision is to stabilize every boat 20 feet and above."

## Fin stabilization

This type of gyro isn't the only way to achieve stability on the water, however. Side-Power's innovative Vector Fin system uses fins, actuators and a hydraulic system to provide an alternative for larger vessels.

The system's computer incorporates a gyroscope, accelerometer and inclinometer to interpret how quickly the boat is rolling and rocking, and it sends electrical signals to the two opposing hydraulic cylinders for each fin. There is a valve block between the pump and the fin's actuator; the valve directs fluid to the fin as needed, and the fin will move up to 38 degrees left or right. It's a seamless, silent process.

"When the cylinders move, the fin moves," says Prentice Weathers at Imtra Corp., Side-Power's North American distributor. Weathers notes that the foam-filled, curved, fiberglass fins serve as underwater "airplane wings" in terms of hydrodynamics.

"The water moving over an angled fin forces the boat to do what it doesn't naturally want to do," he explains. "The faster you go, the water pressure over the fins creates power and lift, and the boat goes back to an even keel. It's pretty cool."

Thanks to their curved shape, Side-Power's Vector Fins are 30

to 50 percent more efficient than straight fins. They generate up to 50 percent more vertical force, wasting less force side-to-side.

Like the Seakeeper, this system also can be used at anchor. Since the pump is attached to an AC electrical motor, it can run off the genny. You can also take advantage of free power by attaching the pump to the boat's inboard engines while running.

Most of Imtra's Side-Power installations are aboard new boats; just 15 percent are refits. Due to the size of the required equipment, including a generator that can handle the electric motor, the Vector Fin system is best suited to vessels from 55 to 130 feet.

## Interceptors

For boats between 20 and 60 feet, there is another stabilization solution. It has taken off like wildfire in recent years, particularly among vessels 35 feet and up. Welcome to interceptor technology.

Mounted on the transom, interceptors are similar to trim tabs. Instead of focusing solely on pitch control, however, they also provide fully automatic roll control through their accelerometer, gyro sensor and GPS antenna.

"Not only do you have comfort and stability with automatic roll control, you also get better fuel economy," says Jamie Simmons, Imtra's product manager for the Zipwake Dynamic Trim Control System. "You'll experience less drag than with traditional trim tabs, and Zipwake's interceptors are more efficient in terms of how they generate lift."

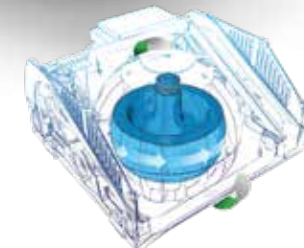
This simple, relatively low-cost system is what Simmons calls "plug 'n play." The interceptors are mounted on a flat transom surface. They plug into a distribution block on the transom bulkhead, and that unit connects to the helm.

"Each installation can vary quite a bit because every boat and configuration is different," Simmons says. "With inboard boats and jetboats, we can easily mount on the transom; outboard and sterndrive boats have more limited space. We always say our cost range is \$2,000 to \$10,000 because a boat might need some glasswork to create a suitable transom surface for mounting."

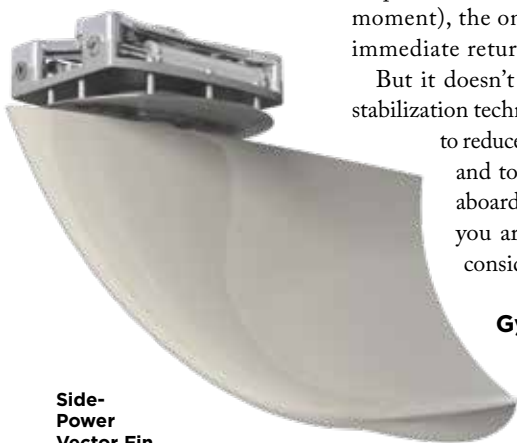
Although the Zipwake system does have its limitations (top speed is 60 knots, and the boat must be in motion for the system to function), it's increasing in popularity. Last year, the company handled more aftermarket than OEM installations.

Whether they specialize in gyro stabilization, fin systems or interceptors, these companies are all dedicated to bringing on-water stability to more boaters than ever.

"We want people to say, 'I remember when boats used to roll,' similar to the way we remember cars without air conditioning," says Seakeeper's Albina. "We want to reach the point where our technology becomes something you don't even think about anymore." ★



Seakeeper's smallest model to date, the Seakeeper 2.



Side-Power Vector Fin



HEATHER STEINBERGER is an award-winning writer/editor who has specialized in boating, travel and outdoor adventure for more than 20 years. Visit her website at [WRITEONLLC.COM](http://WRITEONLLC.COM).

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