HOLDING POWER

It's a function of design, construction and seamanship.

BY CAPT. JOHN PAGE WILLIAMS

WILL THE ANCHOR HOLD? Good question. Your life might depend on your answer. In a constant quest to evaluate anchor-holding power for its own products and the competition, Fortress Marine Anchors set up a rigorous test of 12 comparably sized, premium-brand anchors in typical mud/clay bottom of the Chesapeake Bay at Solomons, Maryland. Brian Sheehan and several other Fortress executives invited a dozen boating journalists to participate and “keep the testing honest” by carefully analyzing the methods and results over four days. Chuck Hawley, former vice president of product testing at West Marine and a videographer, recorded comments on each test (available at fortressanchors.com). Here’s what we found.
Lesson 66 was the 81-foot research overall range. Our platform in the 35- to 40-foot length designed for cruising boats ranged in weight from 21 anchors was random. They were 30 hp bow thruster, 30 hp bow thruster, research-grade GPS (accurate within 0.0003 degrees) position-keeping system and 20 hp hydraulic winch with stainless cable, the big boat proved excellent for anchor testing. The Fortress staffers and Rachel Carson’s skipper, Capt. Mike Hulme, picked out a broad testing area of mud/clay bottom in 26 feet of water. At a specific point (a datum), the deck crew placed each anchor overboard, and Hulme set off along a specific compass course (azimuth). When the scope reached 10 minutes (100 feet) with the winch. A tensiometer set into the cable’s run measured the anchor’s resistance (holding power) in pounds, recording it continuously on several linked computers in the vessel’s lab room as the scope fell from 8.8:1 to 5:1. Then Hulme backed over the anchor, and the deck crew retrieved it. For each pull, we watched the tensiometer plot resistance over time.

**Sonar as an Anchoring Aid**

This exercise made me want to advise any cruising boater to buy a good sonar and learn to read what it tells you about the holding ground where you want to anchor. Firm bottoms return stronger echoes than softer ones, and the sonar on most of today’s multi-function units display echo strength in a range of colors. No, you don’t have to learn to interpret boat and predator signals the way forheads do, but 15 minutes of close attention while probing a range of familiar locations will get you started in reading bottom types. — J.P.W.

**LESSON 66**

As Brian Sheehan said, “Any anchor can fail to set the first time on any given day.”

**Methodology**

Testing order of the anchors was random. They ranged in weight from 21 to 46 pounds and were designed for cruising boats in the 35- to 40-foot length overall range. Our platform was the 81-foot research vessel Rachel Carson, owned and operated by the University of Maryland’s Chesapeake Biological Laboratory at Solomons. With its twin 1,205 hp MTU diesels driving Hamilton water jets, it was a 30 hp bow thruster, 30 hp bow thruster, research-grade GPS (accurate within 0.0003 degrees) position-keeping system and 20 hp hydraulic winch with stainless cable, the big boat proved excellent for anchor testing. The Fortress staffers and Rachel Carson’s skipper, Capt. Mike Hulme, picked out a broad testing area of mud/clay bottom in 26 feet of water. At a specific point (a datum), the deck crew placed each anchor overboard, and Hulme set off along a specific compass course (azimuth). When the scope reached 10 minutes (100 feet) with the winch. A tensiometer set into the cable’s run measured the anchor’s resistance (holding power) in pounds, recording it continuously on several linked computers in the vessel’s lab room as the scope fell from 8.8:1 to 5:1. Then Hulme backed over the anchor, and the deck crew retrieved it. For each pull, we watched the tensiometer plot resistance over time.

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Here are the anchors tested, with weight and material noted. Each anchor was tested with 20 feet of ¼-inch chain. They range from workaday galvanized fluke types to the elegant, polished, stainless-steel plow models, but all are carefully engineered to allow their owners to sleep soundly overnight (though posting an anchor watch is always good idea).

**Fluke Type**

1. Danforth HT
2. Fortress FX-37
3. Lewmar Claw
4. Lewmar COR
5. Lewmar Delta
6. Manson Supreme
7. Manson Boss
8. Mantus
9. Rocna
10. Spade
11. Ultra

**Plow Type**

1. Danforth HT
2. Fortress FX-37
3. Lewmar Claw
4. Lewmar COR
5. Lewmar Delta
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[Accuracy within 0.0003 degrees]
Lesson Six

88 plow types showed reassuring consistency, only twice. Their holding power peaked at or a change in the bottom’s composition. Were worked through a fresh area of bottom. Hulme and the Fortress crew started at a fortressanchors.com. You’ll note that Mike pulls of each of the 12 anchors (including THE HOLDING POWER CURVES During 54 pulls, the nine plow-type MANSON BOSS 21 lb. (10 kg) at 45º 45 lb. (20 kg) 45 lb. (20 kg) 46 lb. (21 kg) JULY/AUGUST 2015 1,430 in. (36) 15-23 23-29 32-41 45-77 a little. The highest holding power (more than 1,200 pounds) came from the fluke anchors, with the Fortress FX-37 set at 45 degrees. (Its soft-mud setting), peaking at 2,000 pounds. At one point when it was in that range, the wake from a passing boat jolted Rachel Carson slightly, and the added force caused the breakever on the winch system to trip. Note, though, that even that anchor delivered varying performance from pull to pull and within each pull. We saw amazing variation in bottom consistency even in the relatively small area where we were working. I spent some time in Rachel Carson’s wheelhouse with Hulme, watching bottom signals on a Furuno FCV-585 sounder. The bottom hardness varied from firm clay to super soft, giving value 5 of mud, sand, shell and combinations of those materials. As a backup, “fly the lead pigeon,” dropping a lead weight with a sticky substance like wax on it to the protocol of averaging the results in from firm clay to super soft, giving value 5 to each anchor’s performance. — JWP

RESULTS

The test protocol called for discarding fouled anchors in making the final judgment. Fate illustrated the wisdom of this provision on the first pull of the Fortress FX-37, when it broke free on long scope because, as we learned when it got back to the deck, it had picked up an oyster shell thick enough to jam between the flukes and the shank. The next day, another anchor picked up nylon line and a waterlogged stick.

The Right Stuff

So what do we take away from all of this research? You need the right anchoring gear and the know-how and experience to safely and securely anchor your boat. Check out these seven essentials.

1. Set it and forget it with anchors. As in baseball, where every pitch counts, each anchor set brings its own challenges.

2. Even with all of the data available, anchoring remains a blend of science and seamanship.

3. Always remember: “Any anchor can fail to set the first time on any given day.”

4. Pay close attention to the specific area of bottom where you plan to set your anchor. Learn to read the sonar signatures of mud, sand, shell and combinations of those materials. As a backup, “fly the lead pigeon,” dropping a lead weight with a sticky substance like wax on it to the area where you propose to anchor, including depth, shoal area, other boats, “dragging room” and predicted wind.

5. If you, your family and your boat are going to depend on your anchoring systems for everything from a carefree lunch and a good night’s sleep to survival in a major storm, learn all you can about anchoring. There’s a lot of information out there ranging from the Anchoring Information tab on the Fortress website to the classic Chapman Piloting & Seamanship (76th Edition, 2013, $30 to $40 from amazon.com).

6. Finally, go boating. Put in your time on the water; learn from both your experiences and your conversations with other skippers, integrate all of it and put it to work for your boat, your family and yourself.

Two Is Better Than One

Always carry at least two anchors. Start with a main one whose rated holding power matches your boat’s length, beam and displacement. Add a lighter “lunch hook” for short stays and fishing. Having the lunch hook will also allow you to set both to hold a displacement. Add a lighter “lunch hook” for short stays and fishing. Having the lunch hook will also allow you to set both to hold a weight.

BoatingMag.COM

Boat Length (ft.) Boat Length (m) Weight (lb.) Weight (kg) Replaces Steel Fluke Anchors (lb.) (kg) Holding Power 32” Hard Sand 32” Soft Mud 45” Soft Mud 32” Soft Mud

HOLDING POWER

32” Hard Sand

FORTRESS MODEL

FORTRESS FX-7 2 lb. (1 kg) at 45º

FORTRESS FX-37 20 lb. (10 kg) at 32º

DANFORTH HT 18 lb. (8 kg) at 32º

ULTRA 4/6 lb. (2 kg)

MANTUS 4/6 lb. (2 kg)

MANSON SUPREME 4/6 lb. (2 kg)

MANSON BOSS 4/6 lb. (2 kg)

SPADE 6 lb. (3 kg)

LEWMAR CQR 4/6 lb. (2 kg)

LEWMAR CLAW 44 lb. (20 kg)

LEWMAR DELTA 44 lb. (20 kg)

ROCN 44 lb. (20 kg)

AVERAGE MAXIMUM LOAD IN POUNDS (KG)

1,862 (845)

995 (451)

990 (449)

840 (382)

480 (220)

650 (295)

600 (275)

540 (246)

530 (240)

440 (203)

384 (174)

350 (159)

To see complete test results for each of these anchors, scan this tag or visit fortressanchors.com/wp-content/uploads/2014/Fortress-Anchor-Test-Avg.2014.pdf

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Leaving plenty of scope in your scope can make the difference between a secure hold and a “dropping room” anchor. In the case of this anchor, the holding power was 6 lb. (3 kg) — enough strength to protes on a 45º yaw. In the case of this anchor, the holding power was 6 lb. (3 kg) — enough strength to protes on a 45º yaw.