

# BOATWORKS

EQUIPMENT, MAINTENANCE & KNOW-HOW

## Black Horse Yachts' new 29R

By Michael Hauenstein  
STAFF WRITER

Since 2000 Black Horse Yachts has been turning out a Down East-style 33-footer in express, sedan and fly-bridge configurations. The semicustom boatbuilder in Harpswell, Maine, now has added a second model to its lineup.

The idea behind the Black Horse 29R was to build something simpler than the 33, with dayboating in mind and without all the amenities of a larger boat to worry about, says general manager Howard Hagar. "We're trying to diversify," says Hagar. "We wanted to build something uniquely different from [the 33], but keeping a family design."

The "R" in 29R stands for runabout ... at least for now. "We were hoping to do a kind of runabout style, but people always want something different," says Hagar. "They seem to want a cuddly boat or a center console."

Because it's a semicustom boat, Hagar says Black Horse will be flexible on the first five or so it builds. In the early stages the configuration really depends on the customer. "We don't have tooling for anything more than a hull at this point," says Hagar. The hull tooling, based on a



design by Geoff Dickes Yacht Design, was built on a five-axis CNC router.

The first 29R hull has been built — the configuration will be determined when there is a buyer — and Black Horse uses a vacuum resin infusion process for construction. Hagar says an infused hull makes for a light, strong boat with an optimized strength-to-weight ratio. Vinylester resins and Core-Cell foam core are used, and the hull incorporates a hand-laminated, foam-cored grid system.

The hull is gelcoated in the buyer's choice of color, though Awlgrip is available as an option. Other options include a varnished teak rub rail, Awlgripp deck (Awlgrip non-skid is standard),

stainless steel bow rail, and teak windshield frame, hand rails and toe rails.

The 29R's traditional profile shows an upswept bow with a gently sweeping sheer that flattens aft. Her modified-vee hull has a 10-foot, 1-inch beam; 26-foot, 8-inch waterline length; and 16-degree transom deadrise.

"There might not be a lot of boats like this built up here in Maine, with 16 degrees of deadrise — we're known for lobster boats with the round bilge — but it's not an abstract design," says Hagar. "It's not unlike a lot of boats used for sportfishing. I think it would be a great boat anywhere up and down the [East] Coast."

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### Q&A

WITH TOM NEALE

#### PENCIL ZINC MAINTENANCE

**Q:** How often should you check and change the pencil zinc in your inboard engine's heat exchanger?

**A:** Your pencil zinc will deteriorate at different rates under varying circumstances. It is critical that you not let it completely erode. It should always be at least partially intact — the more the better.

The purpose of the pencil zinc is to help prevent electrolysis from eating away the metal in your heat exchanger and engine components that are exposed to the raw water. This could cause such problems as holes in the stack of tubes, which will allow raw water and the engine's cooling fresh water (with antifreeze) to mix; degradation of component sealing lips; or holes in the body of the heat exchanger, resulting in leaks into the engine space. Replacement of these components can run into the thousands of dollars, while pencil zincs typically cost only a few bucks.

Here are a few things that increase the rate of zinc deterioration:

1. How much you run your engine. Water racing by the zinc helps it erode, in addition to the erosion caused by electrolysis.
2. The amount of silt in the water in which you run.
3. The salinity of the water in which you run.
4. The metals within your cooling system that are exposed to raw water. Some systems are more vulnerable to electrolysis because the alloys are at different levels of separation on the nobility scale.
5. Electrical events within your boat — for example, even a small current leak to the engine block or surrounding water.
6. Electrical events outside your boat — for example, even a small current leak from nearby boats or dock wiring.

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Have a question? E-mail it to [soundings@soundingspub.com](mailto:soundings@soundingspub.com) or send it to Soundings Editorial, 10 Bokum Road, Essex, CT 06426

**SPECS** LOA: 29 feet, 5 inches BEAM: 10 feet, 1 inch DRAFT: 1 foot, 5 inches DISPLACEMENT: 9,100 pounds TRANSDRIVE: 16 degrees HULL TYPE: modified-vee TANKAGE: 200 gallons fuel (water and waste determined by customer) ENGINE OPTION: twin outboards, single or twin inboards SPEED: 43 mph top, 37 mph cruise PRICE: \$200,000 CONTACT: Black Horse Yachts, Harpswell, Maine. Phone: (207) 833-2400. [www.blackhorseyachts.com](http://www.blackhorseyachts.com)

## Gear Test: Sensibulb LEDs



The Sensibulb LED light (top) measures a little more than 1-1/4 inches square. Below is a traditional filament bulb for size comparison.

By Frank Kehr

TECHNICAL WRITER

Sensibulb is a refined approach to 12-volt DC lighting that was achieved by combining innovative thinking and existing technology with engineering assistance from NASA.

Most of us are familiar with the trend of replacing traditional filament light bulbs in many applications with more efficient LED, or light emitting diode, technology. The solid crystalline structures of LEDs use less current and remain cooler than incandescent bulbs, but they do have drawbacks.

LEDs typically don't provide the same wide coverage or the warm light associated with standard bulbs. With their narrowly focused beams, conventional LEDs need to be ganged together to provide any degree of broad light. An LED's critical operating temperature is around 140 F, and the numerous LEDs required in this configuration can create enough heat within a fixture to affect their reliability.

The folks at Sailor's Solutions felt they had a better idea and spent more than two years developing the Sensibulb. Unconventional in appearance, the Sensibulb light consists of six tiny LED crystals mounted on a printed circuit board. The board is attached to an anodized aluminum heat sink, and the

See *Sensibulb*, facing page



## Seamanship Quiz

Test your knowledge with these Coast Guard license exam prep questions.

1. What datum is used for tide predictions along the Atlantic coast?

- A. mean lower low water
- B. mean high water
- C. mean low water
- D. slack water



2. The boundary between two masses of air of dissimilar properties is called:

- A. an isobar
- B. an isotherm
- C. a front
- D. a trough



3. Where should shut-off valves be installed on fuel tanks?

- A. at the engine end of the fuel line
- B. at the tank connection
- C. no shut-off valve is required on gas tanks
- D. on top of the tank on the fill pipe



4. The first treatment for a third-degree burn victim is:

- A. treat for shock
- B. prevent infection
- C. keep victim quiet
- D. rub with salt water



5. Fire extinguishers are classified on the same "A," "B," "C," and "D" system as fires.

- A. true
- B. false
- C. some are, some aren't
- D. none of the above



6. A 40-meter towboat towing less than 150 meters astern would show how many white lights from the masthead?\*

- A. 1
- B. 2
- C. 3
- D. 4

\*International rules

— courtesy Sea School

Answers:  
1. A 2. C 3. B 4. A 5. A 6. B

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Power for hull No. 1 will come from a pair of 250-hp outboards. However, the 29R was designed to accommodate single or twin inboards, as well (straight shaft, jetdrive, sterndrive or surface drive). "With fuel being such a consideration these days, it seems an inboard diesel is a sought-after propulsion option in this size range," says Hagar. A bow thruster is available as an option.

The layout features a long cockpit that the semicustom builder can set up with a compact galley and a variety of seating options, including an L-shaped settee with a table, centerline or outboard helm and companion chairs, and

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entire unit measures a little more than 1-1/4 inches square by 3/8 inch thick. Designed for the marine environment, the visible circuitry and diode crystals are conformal coated, while the balance of the circuitry is encapsulated in a black temperature-transfer epoxy.

There are two wire pigtailed connected to the light: white for 12-volt DC power and orange for the available dimmer, but more on that later. Installation into almost any fixture is easy using the peel-and-stick foam tape provided or by using an available "G4" socket mount. Wiring is a simple plug-in design, and the built-in logic circuit eliminates polarity issues. The Sensibulb pigtail can be plugged directly into the popular halogen G4 socket or installed in older fixtures by using the available G4-to-bayonet adaptor. The adaptability of Sensibulb to a variety of fixtures eliminates the need to replace the entire fixture when upgrading lighting.

The issues of LED brightness and wide focus were addressed by a Japanese company, while a local engineering firm worked on developing a color spectrum that is similar to a halogen light but with the warm, gold overtone of more conventional tungsten lamps. The difficult part was in controlling the diodes while maintaining them at peak operating temperature. Sailor's Solutions applied for and received a grant for engineering assistance from NASA, and the task of refining the heat sink design was taken over by Boeing Aerospace at the Johnson Space Center, according to the company. The circuitry and heat sink work together to optimize the LED operating temperature at around 140 F, says Sailor's Solutions.

My test setup for the Sensibulb consisted of a 12-volt cabin light, digital volt/ammeter, analog light meter reading in foot-candles, and a constant 12-volt power source. This is no laboratory set up by any means, but it provided general data to show circuitry operation. In theory, as the lamp is turned on the LED crystals emit light and begin to heat up. This heat is transferred to the heat sink and monitored by the internal circuitry. As the temperature approaches the upper limit



29R layout

transom seating. There's 5 feet, 2 inches of headroom below, and the standard arrangement calls for a V-berth and freshwater marine head. The galley can be set up below, and other layout

plans can be accommodated, according to the builder. All interior woodwork is finished in satin varnish.

Base price for the 29R is estimated at around \$200,000. ■

of around 140 degrees, the circuitry will decrease the current being supplied to the diodes, allowing them to cool slightly. The cycle is repeated for the duration of the lamp's usage.

I installed the assembly into a dome light and switched it on, supplying 12.83 volts DC. The lamp was drawing 0.24 amps at 66 degrees and produced 50 foot-candles of illumination, measured 1 foot from the meter. By comparison, the standard 21-candlepower incandescent bulb it was to replace drew 1.49 amps at 277 degrees and produced 42 foot-candles of light at the same distance from the meter.

After five minutes the Sensibulb's amperage dropped to 0.21, the LED rose 101 degrees, and foot-candles dropped to 48. Ten minutes into the test, the LED was 135 degrees, the heat sink was 101 degrees, and the output had dropped to 42 foot-candles. It took 20 minutes for the LED to reach 140 degrees, at which time the heat sink was 110 degrees and the light output 40

foot-candles. The current draw at this point was only 0.16 amps. I introduced a cool breeze across the heat sink for a short time (canned air used for computer keyboard maintenance) and watched the amperage draw and foot-candle readings increase, indicating good thermal control.

Although the foot-candles dropped to 40 during the test period, the visible dif-

See Sensibulb, next page



The light's amperage draw was considerably less than that of the incandescent bulb it replaced, which drew 1.49 amps.

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ference in light output was negligible. The color of the light was pleasing, comparable to a standard 100-watt incandescent tungsten lamp — not an easy task for LEDs. Light output was even and without hot spots, covering at least 100 degrees of arc. I prefer the Sensibulb's light characteristics to the 10-watt incandescent bulb that was supplied with the dome fixture.

As mentioned earlier, the orange pigtail can be used to connect the available lamp dimmer. I also found that by jumping across the two orange wires, the light output is cut in half, but the cur-

rent drops .025 amps. I would think that if the leads were connected to a double-pole toggle switch, you could have two levels of light output at your fingertips.

Sensibulb is thoughtfully designed and well-constructed. Although not inexpensive, it should prove to be a worthy investment if you are concerned about conserving battery power and light quality.

Sensibulb is available in red or white from Sailor's Solutions for \$39.95 each. A reading light bracket sells for \$3.95, the bayonet socket adaptor \$1.95, and the dimmer \$19.95. For more information, contact Sailor's Solution at (631) 754-1945 or visit [www.sailorssolutions.com](http://www.sailorssolutions.com). ■

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Obviously, the more often you check the pencil zinc the better. Eventually you will notice a pattern of erosion upon which you can rely somewhat, but remember this can change.

Be sure to close the engine raw water intake seacock (and any other relevant seacocks) before you unscrew the zinc. Take all other precautions relevant to the job and circumstances, such as making sure there is no danger from electric shock as you touch and work around the engine with wet hands. The engine should be cool.

Drain the raw water side of the cooling system so that water from the zinc cavity won't spill out on engine components — alternator, starter, etc. — when you unscrew the zinc holder. Don't start the engine unless the raw-water pump is again flooded or you've greased it to protect the impeller. Check inside the zinc hole with a small, protected, waterproof flashlight for debris, as from the remainder of the

zinc. Sometimes this will accumulate to the extent that it can impair water flow; you should remove it if this happens. Small amounts of zinc debris are normal and will often break apart and wash through.

When replacing the pencil zinc don't overtighten it, which could split the metal around the threaded port. And don't use Teflon tape or other sealant, as this could impair the conductivity between the zinc holder and the heat exchanger. After running, check that it isn't leaking. I keep at least six pencil zincs for each application on board.

You can buy pencil zincs attached to the threaded plug or just the zincs that you screw into the threaded plug. For the latter, you'll have to clean out the stub of the old zinc from the plug. This sometimes can be done with a sharp tool, such as a dentist's pick, though the job can be rather difficult and might require a drill. You'll then have to sufficiently tighten the new zinc inside the plug so that it won't work out due to flowing water and vibration. ■

# KNOW-HOW



BY MIKE SAYLOR

## 12 TIPS FOR ROWING A DINGHY

Getting from an anchored or moored boat to shore is a problem that, like the tools for chart-plotting, has never had a perfect solution. Most boaters carry or tow an inflatable dinghy — I call them “bubble” boats — equipped with an outboard. Some traditionalists, like me, still carry or tow hard dinghies, which we row.

I must admit I'm not a big fan of inflatables, likely because 2-stroke engines and I don't get along. I can never start 2-strokes, be it an outboard, lawn mower, snow blower or chain saw. (A new 4-stroke outboard with electric start in time might change my attitude.) And bubble boats don't row worth a darn, so aside from them being dive boats, I have no use for them.

Rowing is a reliable, quiet, civilized method of propulsion. And when you row in a new harbor or anchorage, you meet more people and are invited for more drinks. Here's how it works.

After settling in, I deploy the dinghy and begin rowing around our new surroundings. I'll stop to look at a boat, and invariably someone pops up and asks if I need help with something. I tell them we just pulled in and noticed their beautiful boat, so I rowed over to take a closer look. I'm usually invited aboard, shown the boat, introduced to the crew, and offered a drink. I invite them to visit us, and move on to the next boat. After a while, I snake-wake my way back to our boat, having met some nice people and made some new friends. Not a bad way to arrive at a new location.

To reap the advantages of rowing a hard dinghy, you'll need to perfect your technique.

**1.** Basic rowing is simple. Facing aft with the oars in their oarlocks — I prefer ring oarlocks — lean forward with your arms and back straight and oar blades perpendicular to the water.

**2.** Brace your feet, dip the oars so the blades are immersed and, keeping your arms and back straight, return to an upright position while driving with your legs.

**3.** As the boat gathers way and you approach vertical, bring your arms in, keeping your back erect.

**4.** Lift the oars enough to clear the water and cock your wrists so the blades are parallel to the water. You're ready for the next stroke. If you've done it right and are in a decently designed boat, that stroke you just completed should propel the boat about 1-1/2 boat lengths.

**5.** Judge the effect of wind and current on the dinghy as you approach your landing. Try making your approach upwind or upcurrent, and come in at about 45 degrees.

**6.** One boat length out, pull on your inboard oar to start the boat turning parallel to your landing and let the oar rest on the gunwale. Keep the outboard oar ready to use as a pivot and to increase your control.

**7.** Back-water with your outboard oar, slow the boat and pivot the stern in toward the landing.

**8.** Ship your inboard oar by lifting it and the oarlock from the gunwale.

**9.** Make a gentle touchdown, secure the boat, relax and have a beverage. Any landing you can walk away from, dry, is a good one.

Unfortunately, hard dinghies are less stable than inflatables and don't have the carrying capacity. However, rowing dinghies provide greater control when trying to beach in moderate to heavy surf. Here's my technique:

**10.** Turn the boat so the bow is facing the breaking waves.

**11.** As the wave comes to the boat, row into it at right angles, cresting the wave and then letting it carry you ashore using the oars to maintain direction.

**12.** Row backward in the troughs and repeat the procedure as the next crest comes in. I've never had a dinghy yaw out of control and broach in surf.