



# No Jokers on This Boat

tally friendly treatment of waste and legal overboard discharge” LectraSan, boaters still have to use holding tanks.

**Smell.** Holding tanks, which never seem to be large enough, can smell awful if not drained frequently.

Waste hoses eventually start emitting odors as well.

**Space.** All these components take up lots of space. We reclaimed a lot of this space for our new under-sole fuel tank and for water maker filters.

The alternative to a traditional marine toilet that pumps fresh or sea water is a composting head. Immediately, no doubt, the awful stink of a toilet in a national park just entered your mind. Given some of the earlier attempts at composting heads, you have reason to be skeptical, as I was when I started my research. As it turns out, two of our sister ships have had marine composting heads for several years. With an open but incredulous mind, I interviewed them and read their owners’ group bulletin board comments. All I needed was one bad report to alter my plans, but both crews seemed happy with their choice.

## Selecting and installing a composting marine toilet

By Pete Dubler

**A**s we considered the vital systems during the restoration and refit of our Pearson 424, *Regina Oceani*, the marine toilet system (aka “head”) was near the top of the list. While we had perhaps the most revered hand-pumped head ever designed—a Wilcox-Crittenden Skipper—there were still several compelling reasons to jettison this head and its accompanying hoses, valves, vented loops, holding tank, LectraSan waste processing system and macerator pump.

**Failure modes.** The joker valve is a vital component in the design of marine toilets, but even the best-designed ones sometimes get stuck open. When this happens, things get messy. A clogged vented loop can allow seawater to be siphoned into the boat, and leaky joints can leak waste into the bilge—a mess like none other to clean up.

**Discharge.** More and more areas are becoming discharge-free zones, meaning that even with a “U.S. Coast Guard certified Type I Marine Sanitation Device for environmen-

## HOW TO BE ODORLESS

The key to an odorless life with a composting head is the separation of urine from solid waste. As long as the amount of moisture in the solid waste bin is kept to a minimum, the peat moss that seeds the composting process and the naturally occurring bacteria in the waste can do their jobs. Moisture allows for the anaerobic processes that lead to the big stink we associate with those national park toilets. The design of the bowl of the composting heads separates the urine and drains it into a removable two gallon tank. The Air Head also provides provisions for routing the urine to a larger holding tank via a foot pump, if desired. The urine itself has little smell but can be “sweetened” by adding a little sugar to the tank, which chemically reacts with the slightly odoriferous components in the urine.

After doing the requisite web-based research, I narrowed my choice to two self-contained systems. These turned out to be the same two models found on my sister ships: the Nature’s Head and the aforementioned Air Head.

My next step was to speak directly to the manufacturers about why they view their product as superior. Most of the differences came down to simple details, such as Nature’s Head’s angle-cut base, which can make it easier to mount the unit on an outboard wall. Some of the advantages, such as Air Head’s reversible crank (designed to avoid jams of the agitating bar) versus Nature’s Head’s crank (which only turned one direction) are transient—just a few months later, Nature’s Head converted their product to a similar mechanism.

The big scale-tipper for me was the long history of thoughtful improvements made by Geoff Trott



The old toilet platform with hose holes was sealed with epoxy. Next, it was edged and covered with 1/2" high density polyethylene (HDPE). Mounting clips for new head are in place

of Eos Design, the makers of the Air Head. Geoff has been making the Air Head since 2001. He presented a sound engineering reason for every design element of his product. Many of these improvements were solutions to suggestions customers presented over the years. For example, the agitator bar on the Air Head is a helix that moves the composting material instead of just stirring it, speeding the composting process.

## AIR MOVEMENT IS KEY

For me, the biggest difference between the two units is the movement of air and the sealing of the units. A barely detectible but continuous movement of air through the solid waste bin is key to the drying and composting process. Any engineer will acknowledge that air sucked through a hose flows more smoothly than air pushed through the same hose. The Nature’s Head has its fan

located on the head, while the Air Head places the fan in your choice of a straight or elbow fitting that butts up to the vent you select for your boat. The helix of the hose screws directly into this elegantly designed fitting.

## FLIES OR NO FLIES

Designing a toilet to avoid fly infestation requires understanding how such a thing gets started: one fly, attracted by the odor, in the wrong place at the right time. Air flow and minimal moisture in the solid waste bin will reduce the odor, and keeping the bin sealed as much as possible reduces the likelihood of that first fly in the ... well, you know.

The Air Head has a very fine mesh screen on the fan output to prevent flies from entering if the fan is turned off. The urine container can be removed for emptying without opening the solid waste bin. The seat and lid are made airtight by their unique rubber seals. These gaskets provide the added benefit of holding the seat steady while you ride the head in a seaway. The removable seat of the

Air Head versus the molded-in seat of the Nature's Head allows for both standard and elongated seats—brilliant and simple solid engineering



Vent hose for new head neatly routed through cabinet

solutions addressing user desires and potential problems.

## INSTALLATION

Removing the old toilet system was much more time consuming than installing the new composting

head. I first replaced the high-density polyethylene base under the old head since the old base had holes for the now dreaded hose. With a clean base in place, all

I had to do was place the head, mark the position of the two mounting clips with masking tape, move the head (which weighs nothing compared to the old bronze beast) out of the way, fasten the two clips with the provided screws, place the head, and tighten two thumb screws. Routing the venting hose took more consideration.

The hose can come out of either side of the head. Since I chose to route the hose first through a cabinet and then up behind some shelves to the ceiling of the head (the compartment in which the head lives), I ordered two extra feet of hose with the head. I found that 1 1/2" grey plastic

electrical conduit clamps from the home center fit and matched the provided hose perfectly. I had the option of venting out through the existing Dorade vent and being done with the project. Instead, I decided to retain the incoming ventilation of



Feature	Nature's Head www.natureshead.net	Air Head (Our Choice) www.airheadtoilet.com
Fan	Pushes; built into head	Pulls; built into vent adapter; fine mesh screen
Seat and cover	Molded in; one size; no seal	Replaceable; standard or extended; air-tight seals
Clearance to wall	2 to 2 1/2" required to allow raising and removing of the bowl without unbolting toilet from the floor	1/8" is sufficient
Overall installed depth	~20"	17 5/8"
Clearance considerations	Angle-cut back of base to fit against sloped bulkhead	Round base to fit well in corners
Emptying	Must expose solid waste to remove urine tank; no handles on solid waste bin; translucent urine tank allows viewing level of urine tank above ~half full	Urine tank can be removed without exposing solid waste; solid waste bin has handles and includes sealed cover for transport; external sight tube to indicate urine tank level
Options	Close-clearance "spider" crank handle; solid waste bin cover	Straight or elbow fan/vent adapter; remote holding tank fittings
List price (May 2011)	\$875	\$969

the Dorade and placed the outgoing vent further inboard using the Air Head elbow fan enclosure mated to a Vetus Portus mushroom ventilator. This ventilator can be closed simply by twisting it down if necessary. I ran the wires from the fan enclosure through an inline fuse holder to an adjacent light's power supply. The fuse holder provides a convenient way to turn the fan off if the head is clean and empty and not going to be used for a while.

## USAGE

The Air Head comes with a brick of coconut-based peat moss-like substance called CocoTek, which is hydrated overnight with about 1.5 quarts of water to create the composting 'seed.' Alternately, peat moss from a garden center could be used, but the coconut bricks seem to be more in line with supporting the tropical economy and store easily—a case of 24 bricks takes up only 1¼ cubic feet and weighs 38 pounds.

There are two methods for using the toilet. First, there's "direct bombardment" by opening the trap door so the waste drops directly

into the solids bin, which leaves the bin open longer for potential fly visits. Second, there's the "two-step dump and dump," in which a coffee filter is placed in the bin over the trap door, which is opened briefly at the end of the usage to drop the filter and its load into the bin. A piece of newspaper or toilet paper, which is welcome in the composting head, could be used instead of the filter. The solid waste bin has a capacity of 60 to 80 uses. The longer the waste is in the bin, the more complete the composting will be. The end result is peat moss. Of course my friends ask, "Pete, when Jill uses it, does it make Jill moss?"

To empty either head, the bowl section is first removed. On the Air Head, four thumbscrews are loosened and the bowl turns slightly counter-clockwise to release. The Nature's Head bowl swings up and over on a removable hinge. The recommended next step for the Nature's Head is to put an 11-gallon garbage bag over the waste bin and invert the unit to transfer the contents to the bag. The Air Head comes with a

sealed cover for the bin (a separate option for the Nature's head) and the bin has two handles to make carrying the whole bin to its dumping site discrete. The Nature's Head lacks handles on the solid waste bin. On both units, the vent hose is connected to the upper section of the toilet so it does not have to be disconnected when the solids bin is removed or inverted.

How well does it work? So far, with summer and the big project of painting the boat just starting, all signs are good for an odorless and convenient toilet. Did I mention that composting heads are ideal for usage while your boat is out of the water, too? ~

*BWS is following Pete and Jill Dubler's refit and restoration of their Pearson 424, Regina Oceani. After more than 5000 offshore miles crewing for others, Pete selected the 424 for future cruising. It will take a few years, but Pete is committed to the belief that cruising should not be "repairing boats in exotic locations," so she will be "sound and Bristol when she splashes."*