

# KEVO'S BOATING TIPS & MORE

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## **Marine Sanitation Devices**

**S**o there I was... cruising along at about 16 kts. on a long tack under sail on a 40-ft. catamaran my buddy had chartered for the weekend in La Paz, Mexico. I asked where the "head" was and how it works. The skipper informs me that it is in the starboard pontoon and very user friendly. Sounds OK to me.

I go down there and find the head; close the door; and open the lid. To my amazement, four feet under the head is the freaking Sea of Cortez rushing by at approximately 20 mph. (The Skipper wasn't kidding. I like that in a skipper.) Now that was a "moment" for an environmentally friendly resident of California.

Meanwhile, back at the ranch my wife, Susan, (The Admiral) has informed me that she has "had it" with the holding tank capacity on our yacht, *Her Way*. She and I can go out for only three days before we need to return to port for a pumpout. She says it's my fault because I'm so full of it. This situation is exacerbated by the electric toilets we have onboard. These toilets use an awful lot of water to flush.

I have always been reluctant to even consider installing a marine sanitation treatment system on any of the vessels I've owned over the years. I just didn't feel good about pumping waste overboard under any circumstances. The fact of the matter is I didn't even know how they worked or if they were effective in maintaining a clean water environment. Now that I have my "marching orders" to address the issue on our boat, I thought I'd kill two birds with one stone and investigate our options while providing our readers with similar marine sanitation issues a few tips on these systems. But first:

### **The Law**

The Federal Water Pollution Control Act of 1972 prohibits the discharge of raw sewage from vessels navigating in the waters of the United States. The law provides three sewage disposal alternatives:

1. Raw sewage may be retained onboard and subsequently transferred to pumpout on shore for delivery to a sewage treatment plant (A type III Device).
2. Raw sewage may be processed through a Coast Guard-approved onboard marine sanitation device (MSD) and the treated waste discharged overboard (Type I & II devices). Type I is for vessels under 65 feet. Type II is for vessels over 65 feet.
3. Raw sewage may be discharged into the sea when outside the three (3) mile limit (in some cases 9 miles).

## **Water "Purity"**

This information I found both enlightening and encouraging when it came to the prospects of deciding to purchase an MSD. The efficacy of sewage treatment and "purity" of sea water for purposes including swimming and the harvesting of shellfish for human consumption is typically measured by the number of coliform bacteria present in a 100 milliliter (approximately 3 ounces) sample of water. Existing Coast Guard and Environmental Protection Agency (EPA) regulations allow MSDs to treat waste to a 1,000 coliform per 100 ml. standard. In general, the sea at bathing beaches in the U.S. is considered safe for swimming when it contains up to 200 coliform per 100 ml. of water.

The MSD's I'm going to write about treat waste to a purity level of 10 coliform per 100 ml., making them 20 times cleaner than "allowable" swimming waters. This degree of water purity often surpasses that of the water in which the boat is floating. Achievement of this level of treatment assures that even prior to the massive dilution that occurs immediately upon discharge of the treated effluent (dilution in excess of 10,000 to 1 within minutes) there can be no detrimental effect on the environment, according to the manufacturer. (Quite impressive.)

## **"Y" Valve**

Large and even some small yachts have what is known as a "Y" valve. The purpose of this valve is to direct the flow of (black water) waste either overboard, into an MSD or into a holding tank. The USCG requires that this valve be shut and secured when the vessel is within the three-mile limit.

One of the core competencies included in Pacific Powerboating onboard instruction is "Machinery/Systems Orientation." More often than not my clients don't know what this valve is for, where it is located or the importance of having it "secured" in the closed position. Often, on recently purchased used vessels, I discover that the Y valve is in fact in the open position allowing waste to flow overboard. (I fix that in a hurry.)

"Securing" this valve is open to interpretation. Strictly speaking, it should have a combination or key lock securing it closed. However, I have found that it is acceptable to secure it with a "cable tie." These are very reliable and can only be undone by (intentionally) snipping the plastic tie. If your vessel has a Y valve, find and secure it closed.

A company called Raritan Engineering in Millville, New Jersey, makes the two most popular MSD's. For more information on these systems contact Raritan Engineering Company Inc., 530 Orange St., PO Box 1157, Millville, New Jersey, 08332 or call 856/825-4900 (office) or fax 856/825-4409 or visit [www.raritaneng.com](http://www.raritaneng.com). One system is made for saltwater application, the other for fresh water.

## **Purasan**

The Purasan™ system was developed at the request of commercial houseboat rental outfits on freshwater lakes and rivers. The basic difference between this system and the Electro Scan® system is the Purasan does not require salt water or electrodes to sanitize waste. It is designed for vessels operating in fresh water. A single chlorine tablet cartridge is placed in the tablet dispenser and lasts for several hundred-treatment cycles. These

tablets are basically the same chemical used by municipal waste treatment plants. Every time you flush, the bactericide is released in small quantities into the untreated waste.

The Purasan system is just starting to gain popularity in the California Delta. Not many have been installed and the company does not have a focused consumer marketing campaign in place for this system at this time, so the info I was able to obtain on it is sketchy.

### **Electro Scan**

This system is the next generation of a venerable design called Lectra/San®. Lectra/San was developed in the 1970s and worked very well. The only drawback was it used a lot of electricity to work and this tended to drain the marine batteries too low.

The Electro Scan system utilizes electrodes, which temporarily convert salt water into a powerful bactericide. The treated wastewater then safely and conveniently reverts back to its original state of salt and water. No harmful or unnatural chemicals enter our environment.

The design of the treatment tank optimizes the thoroughness of treatment by forcing the bactericide and bacteria into direct contact, effectively killing viruses and bacteria.

The Electro Scan can be installed with one or two marine toilets to form a complete sanitation system.

The flushing action of the toilet discharges waste into the first chamber of the treatment tank. Here the waste is macerated and receives its first treatment. Specially coated electrode plates create an electrical field and convert salt water to hypochlorous acid, a powerful bactericide. Once the treatment solution reacts with bacteria and waste, it reverts back to salt and water.

The next time the toilet is flushed new untreated discharge enters the second chamber. While the new waste is being treated in the first chamber, the contents of the second chamber are stirred and treated again. Each successive flush moves the previous toilet discharge through the Electro Scan and eventually overboard or into a holding tank.

When discharges enter the marine environment, virtually all pathogens have been eliminated.

We have not decided to purchase an MSD or which system to install as of yet. Two things we have agreed on is that the system will require a thru hull discharge below the waterline and a holding tank to manage discharge around swimming areas. I'm sure our readers would appreciate any feedback from Electro Scan or Purasan MSD systems owners in NorCal and those opposed to such systems. So let's hear from you!

**Be safe and happy boating. As always, feedback is appreciated. I can be reached at 925/890-8428 or kevo@yachtsmanmagazine.com.** ✍



**Purasan™ marine sanitation device (MSD).**



**Electro Scan® marine sanitation device (MSD).**