

Boats

FUEL OF THE FUTURE

by Bob Stearns

Ethanol gasoline is coming to a pump near you. Will your boat's engine know the difference?

FOR THOSE OF YOU WHO don't already know, the oil industry is in the process of abandoning methyl tertiary butyl ether (MTBE), an oxygenate used for decades to make gasoline burn cleaner. The additive that is

replacing MTBE is ethanol. Designated E10, the new fuel mixture will be 10 percent ethanol and 90 percent gasoline. (E15 would be a 15–85 percent mix, and so on.) Once current supplies of MTBE have been used up, there won't be any more.

The total elimination of MTBE and conversion to E10 will probably take up to two years. Depending upon where you live, it could show up in your neighborhood within a matter of months.

Contrary to popular belief, MTBE has not been federally outlawed (although some individual states are apparently in the process of doing this). Actually, Big Oil volunteered to discontinue the use of MTBE because the Energy Policy Act of 2005 did not grant the industry the desired level of liability protection from the consequences of continued MTBE use. You see, MTBE has been determined to be carcinogenic and also has been found in groundwater in some areas. Ethanol is also more environmentally

New ethanol-blend fuel is headed to the market soon, and with this potent solvent in the mix, proper engine, fuel-tank, and fuel-line maintenance will be more important than ever.

friendly—so call it an economic decision.

As it turns out, there are both benefits and potential problems from using ethanol that especially pertain to boat owners. Ethanol burns clean and has a 100 octane rating. Plus, using 10 percent of the stuff mixed with gasoline means a little less foreign oil we will have to import. From a fuel standpoint E10 works just fine in any two- or four-stroke gasoline engine. And although ethanol produces somewhat less heat energy than gasoline when burned, extensive testing has shown that a 10 percent mix results in an average of only 1.5 percent loss in mpg. You would never know the difference.

E10 and the Marine Environment

Most of the potential problems of using ethanol as a marine fuel stem from the fact that it is both hygroscopic (absorbs water) and a potent solvent. For years, small quantities of ethanol have been used in fuel stabilizers and tank cleaners. In fuel stabilizers, ethanol works to absorb raw water, which will otherwise not go through carburetor jets or EFI injectors. But once the water has been absorbed by ethanol, it will burn cleanly.

The amount of ethanol in E10 is obviously greater than in small quantities of any fuel additive, but it will still absorb only a very small amount of water per gallon before it becomes saturated. Once the saturation point has been reached, the water and ethanol separate into their original state (a process called phase



STEVE WALBURN

separation), which leaves you with a raw-water problem once again. But, if you've been diligent about keeping your tank free of water and your inline fuel-filtration system properly maintained, there should be no raw water present in the first place. And here's a good tip: top off the tank at the end of the fishing day. A tank full of fuel has almost no room for moisture-containing air to enter and condense into water.

But any amount of raw water in the fuel tank, almost regardless of how little, can still attack the tank's inside walls and thus directly cause other problems. Most tanks produced today for small boats are constructed of aluminum, which is susceptible to water corrosion. And while fuel filters take care of small amounts of water, particles of corroded aluminum can get through most water-separating fuel filters and cause serious problems if it gets to the injectors. Some older fiberglass tanks (made prior to 1990) may also be affected by the solvent effect of ethanol.

Also, as we make the transition from MTBE to E10, keep in mind that all gasoline typically begins to deteriorate by the time it leaves the refinery. In a climate where the heat and humidity are high, it takes only about six months for it to form gummy, varnishlike deposits on the walls of the fuel tank. If raw water is present, the process simply accelerates.

This wasn't a problem in the past, as the MTBE in gasoline didn't disturb these deposits. But when you start pumping E10 into a tank with deteriorated fuel deposits, ethanol will dissolve those deposits into particles small enough to go through a water-separating filter. You can use a filter that blocks everything down to 10 microns, but if the volume of this garbage is great enough, it will eventually overwhelm the filter and adversely affect your engine. So, if you've got a tank that has old gasoline deposits in it, you might want to replace it or spend the bucks necessary to have it properly cleaned before E10 becomes the only fuel available.

Lately, I've been hearing rumors that E10 mixed with a tank containing a significant amount of MTBE gasoline will react to form a white powderlike precipitate.

Supposedly this precipitate is small enough to get past the standard inline water-separating filters, which typically exclude everything larger than 25 to 30 microns. But according to Frank Kelly, Mercury Marine's resident fuel expert, MTBE does *not* react with ethanol at all. So if a white powder does happen to form inside the tank after mixing E10 with MTBE gasoline, it's most likely caused by the solvent effect of ethanol on any corrosion or other contaminants already present in the tank.

Also, boats are generally operated in

some of the gaskets. The good news is that we have learned from history. The problem was corrected 20 or so years ago, and the fuel lines on today's outboards and other marine engines will handle E10 just fine.

Still, what's going to happen when you fill up with that first batch of E10 gasoline? If you've been diligent about keeping your tank free of water and your fuel stabilized (especially during off-season storage), you will never know the difference.

But if you've been a little careless

Fuel Stabilizers

There are lots of fuel stabilizers on the market, so be deliberate about your choice. As I've already mentioned, stay away from those containing alcohol. It's best to avoid using additives that are not formulated by one of the outboard engine manufacturers or not designed specifically for marine use. Some automotive type additives are little better than snake oil, especially where boat engines are concerned.

Through many decades as a boat owner, I've tried a lot of different fuel additives. But about six years ago I settled on one that I'm still using today: PRI-G, which is made by Power Research Inc., (www.priproducts.com). PRI-G does not contain any alcohol, and only an ounce of the stuff will stabilize 16 gallons of gasoline for more than two years.

It is also a carbon dispersant, which keeps the cylinders clear of soot and carbon particles. And this is great news for owners of two-cycle outboards, which are sensitive to carbon buildup under the rings. Excessive carbon buildup causes a problem called "ring-jacking" that forces the rings outward against the cylinder walls. PRI-G sells for about \$20 for a 16-ounce bottle; that's less than eight cents per gallon of gas.—*B. S.*

high-humidity environments where problems associated with water in the fuel are common. So, keeping the fuel stabilized is an important consideration. Many fuel stabilizers, however, also contain ethanol, therefore it is probably a good idea to avoid mixing those stabilizers with E10. It's liable to increase the risk of phase separation. It'll be best to use stabilizers that are ethanol-free (see sidebar).

Remember Gasohol?

During the fuel crunch of the early 1970s, oil companies began adding ethanol to gasoline in a 10 to 15 percent mix called gasohol, and it caused some real problems with marine engines. Especially outboards. Ethanol attacked the rubber used in fuel lines back then and also

about those considerations, you could be at risk. Now would be a good time to check your external inline fuel filter to make sure it is still in good condition and that the bowl contains no water. If you do not have a good external filter, now is definitely the time to install one. Don't depend upon that small, factory-installed filter on your engine; even if it works it doesn't have the capacity you'll need for E10 fuel. Also, check the tank to make sure it is clean and free of water. And by all means start using a non-alcohol fuel stabilizer immediately, so that when E10 finally does show up in your neighborhood, you'll be completely ready for it. ■

Bob Stearns writes about boats and saltwater fly fishing from his home in Miami, Florida.