



Ethanol Fuels 2009

(from the Ontario Marinas Association)

Ethanol was widely introduced to the US market in 2005 and has been used in Canada in varying quantities for at least 3 years. E10, the most common mix is a ratio of 10% ethanol and 90% gasoline and Ontario has regulated that all fuels sold must meet a 10% ethanol average. That does not mean all fuels sold must contain ethanol, but the only fuel now advertised as being ethanol-free is V Power Shell, and as marine technicians you will be seeing more ethanol-related issues.

For the marine industry, the fit isn't so good. Ethanol is a solvent that doesn't mix well with fuel and fuel byproducts lingering in some tanks. It scours fuel systems, overburdening filters, it breaks down fiberglass fuel tanks and it rapidly absorbs water from atmospheric humidity, giving fuel only a brief shelf life. Ethanol use is changing the way gasoline powered boats are maintained, serviced, used and regarding some components, constructed.

As recently as 2003, boat designer, Dave Gerr was promoting the use of fiberglass fuel tanks. Not any more! He is now quoted, "Since the switch to E10 began, there has been a sudden rash of tank and fuel problems. Research by BoatUS and several marine surveyors traced problems back to ethanol reacting with and dissolving the resin in the walls of fiberglass tanks. All fiberglass resins are attacked by ethanol! Tank walls may be seriously weakened causing leaks, and styrene and related chemical byproducts dissolved in or reacted with the ethanol work their way into fuel systems, creating serious fouling problems. There are thousands of gasoline-powered boats in service with fiberglass fuel tanks, including vessels from the top builders. All of these tanks are now suspect and no new fiberglass tanks should be designed or built. When surveying, retrofitting, repairing, owning or operating an older boat be sure to determine the tank material. If the tank is fiberglass make sure there is no degradation. Surveyors and repairers should also pay close attention to flexible gas lines and hoses whenever servicing boats."

From Technician Dan Crete / New York and Connecticut.

When combined with MTBE gasoline, fuel filters severely clog and even deteriorate. The two products mixed in boat tanks upset the vapor pressure of the fuel causing cold start and vapor-lock problems. In isolated cases severe corrosion of aluminum fuel system components have been documented and attributed to mixing the two fuel types. To avoid this problem boat tanks should be run down to the lowest safe level before taking on ethanol fuel. Fuel suppliers are in transition. Boat owners who navigate the initial switch need to be wary of where they take on fuel during the season. Boat owners who trailer their boats and fill at service stations must be aware of what they are buying.

Marinas must also sell their stored fuel off before adding the ethanol blend. Reputable fuel distributors will give dealers steps required to prepare storage tanks and pumping equipment. Those include: ensuring tanks are clean; there is no water in the system; upgrading filters to 10-micron, ethanol compatible, water separating filters. Because ethanol is a solvent, it will clean dirt or contaminants from both dispensing and boat fuel systems. Boat owners and marinas report that filters clog often with the first few loads of fuel but the filters do take care of the dirt.

Carrying spare ethanol-compatible filters will be a must for boaters and marinas. Boaters must have the spares and the means to change them, including a method of safely storing the old filter and the gasoline it contains, onboard.

Ethanol, being alcohol-based absorbs water. Marine fuel systems are very susceptible to water intrusion. E10 has the ability to absorb 6,000 to 7,000 PPM of water into solution and allow it to be burned by the engine. In a 375 liter tank the fuel could hold about 2.5 liters of water without separation. The problem comes when the fuel is saturated beyond its capacity to hold any more water. Phase separation takes place and leaves two solutions: a high concentration of water and alcohol, and gasoline with no oxygenate. The water-alcohol solution is highly corrosive to aluminum and other fuel components and the oxygenate-shortened gasoline will cause engine damage. The only solution is to drain the system and start over again. E10 will also absorb water directly from humidity in the atmosphere through fuel vents. In 100 days at 70% humidity E10 can absorb enough water to phase separate. E10 is only good for 60-90 days if left without treatment. Non-alcohol based fuel stabilizers can extend the life and is recommended. Contrary to past practices it is preferable to leave boat tanks low on fuel and the more boats are used the better it will be. For winter storage leave the tanks as low as possible and treat with stabilizer what is left.

Precautions for the Switch to Ethanol

- Do not mix ethanol with old formula fuels.
- Avoid water infusion into fuel system.
- Run non-alcohol based fuel stabilizers in the boat fuel system at all times – Especially recommended for equipment that sits for extended periods with light use.
- The more use the boat gets, the less likely it is to have problems. Don't leave large quantities of E10 fuel aboard idle boats.
- Install good quality, ethanol compatible fuel filters.
- Keep a stock of spare filters and the means for safely changing them. (Boaters and Marinas)
- Replace old weather-faded portable plastic tanks with new ones.
- Retailers should inform customers what type of fuel they are dispensing. Customers should ask what type they are getting during the transition to E10
- Fuel lines older than late 80's should be inspected and may need replacing.
- Some older carbureted engines may require special tuning – Consult engine manufacturer.

The fuel changes and new risks they bring may not be as bad as they first appear. For retailers, if your fuel dispensing equipment is well cared for, and is clean and water-free, then you shouldn't have any trouble. For boaters (who are our valuable customers) if they have had water problems in the past, those problems will only worsen with E10. Correct the water situation and start fresh with a new supply of E10.

For Ontario.

According to Jim Linstead, Territory Manager for Shell, they would not have E10 fuel sold to marinas in Ontario in 2008 but would in 09. For those Shell dealers that sell V Power only, it will probably not have ethanol in 2009.

For marinas with other fuel brands, consult your distributor as to what they are supplying and get their advice on how to make the changeover as painless as possible.

Trailer boaters who refuel at service stations could end up in your service departments with some of the above problems, as most of this fuel will be E10 and again mixing types of fuels could be painful.