

Pros and Cons of 10% Ethanol in Gas



If not already, you will soon be using 10% Ethanol as a replacement oxygenation additive for the discontinued MTBE (methyl tertiary-butyl ether) in gasoline. With this change comes a multitude of questions and misinformation within the boating community that needs to be addressed. The fact is that there will be many more problems with boats' fuel tanks than there will be with automobiles' and the reason for this is the requirement for marine fuel tanks to be "vented." This allows the Ethanol to absorb moisture from the humidity entering through the vent, thereby adding additional condensation to the fuel. Following are some of the known facts about Ethanol when mixed into gasoline at the present designated ratio of 10% by volume (E-10).

- Ethanol attracts more water than plain gasoline.
- Ethanol contains only about 2/3 as much energy as plain gas, therefore getting poorer mileage (approx. 3%) for the same volume of gasoline.
- It only takes about 3/10 of 1 percent of water (.3%) to begin separating the water and 75+% of the Ethanol from the fuel, which then drops to the bottom of the tank with the water. There it forms what is known as a "single phase separation" layer of water and Ethanol under the gasoline. This small amount of water equates to slightly under 4 oz of water per 10 gals of gasoline.
- When the water/Ethanol layer at the bottom of the tank rises to the level of the fuel pickup, it will be sucked up into the engine, shutting the engine down. The water/Ethanol layer WILL NOT support combustion.
- [MDR's Water Probe Indicator \(MDR-566\)](#) can determine if water is present at the bottom of a fuel tank, and in fact, how much water is there as long as the tank can be dipped straight down. If necessary, removing the fuel sender provides a typical access for this test.
- Ethanol (E-10) adds about 2 points of octane to the gasoline when totally in solution, but then loses that octane when the Ethanol drops to the bottom of the tank with water.
- E-10 evaporates more quickly than plain gasoline, thereby losing some of the added octane in the process.
- E-10 will deteriorate fiberglass fuel tanks (pre-1985), allowing the residue to eventually clog up fuel systems and intake valves enough to seriously damage engines.
- Tests have shown that [MDR's NEWEST PRODUCT, E-ZORB \(MDR-574\)](#), will totally emulsify the phased separation of water and Ethanol at the bottom of a fuel tank right back into the fuel, allowing it to pass through the finest filters and safely burn through with the fuel. At the same time, the octane lost when the Ethanol went to the bottom of the tank with the water will also be replaced back into the fuel.
- E-ZORB, LIKE ALL MDR FUEL ADDITIVES, CONTAINS NO ALCOHOL OR METHANOL.

A simple field test will prove how well E-Zorb works to remove standing water from E-10 gas. Components needed:

- A clean, clear quart-size glass jar with cap
 - E-10 gasoline (10 oz minimum)
 - Water
 - E-Zorb
1. Add approximately 10 oz of E-10 gasoline to the glass jar (not quite 1/3 full)
 2. Add two (2) capfuls of water to the jar using the E-Zorb cap. This should immediately drop to the bottom (see Fig. 1).
 3. Add two (2) capfuls of E-Zorb to the jar and shake or stir. The fuel should become cloudy and the water/ethanol solution on the bottom should turn white. (See Fig. 2.) The cloudy fuel indicates the E-Zorb is working but needs more to complete the emulsification process.
 4. Adding another ½-capful of E-Zorb and stirring should clear the fuel without any water/ethanol remaining on the bottom (Fig. 3).



Figure 1

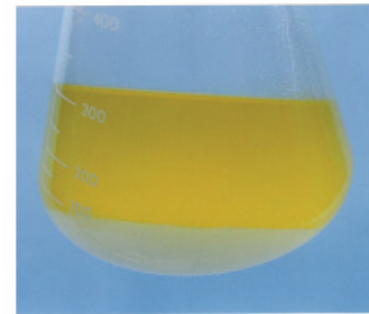


Figure 2



Figure 3

Should the fuel stay cloudy, an additional ½-capful of E-Zorb is necessary to complete the emulsification. The amount of E-Zorb needed changes slightly due to the different amounts of ethanol in the fuel as the E-Zorb must emulsify the total phase separated solution of water and ethanol on the bottom. Once clear, the fuel is as good as new and can be used accordingly.

Winterizing and Prolonged Storage of E-10 Gasoline

Any vented fuel tank containing E-10 gas that stands for longer than 30-45 days should be treated with the following winterizing procedures to maintain the integrity of the fuel.

1. Try to determine if there is any standing water/ethanol on the bottom of the tank. Check fuel filters, water/ separators, or use [MDR's Water Probe Indicator \(MDR-566\)](#) if the tank can be dipped straight down.
2. If no water is indicated, E-Zorb should be added at the suggested ratio of 1 oz to 20 gallons of E-10 gas to compensate for condensation during storage. If an excessive amount of water is indicated it should be safely pumped out and discarded according to local hazardous waste disposal methods. Then add an equal amount of E-Zorb to the remaining phased out water/ethanol on the bottom and agitate fuel (per "3"



below). When the fuel clears all remaining water/ethanol has been emulsified back into the fuel (Fig. 3 above). Clear fuel can be determined by checking a fuel sample from the fuel filter or water separator after running the engine for a short time.

3. Now add MDR's Gas Stor-N-Start to the tank at a ratio of 1 oz to 5 gallons of gas with enough Stor-N-Start to treat the tank when totally full. Immediately thereafter fill the tank with fresh E-10 gasoline, which should be enough to agitate the E-Zorb and Stor-N-Start, dispersing them throughout the tank. However, if the tank is already full or only needs a small amount of new E-10 gas, insert an air hose to the bottom of the tank allowing the air pressure to bubble the gas for 5-10 minutes. This should be sufficient to complete the agitation process. Then, after running the engine for 5-10 minutes to circulate the treated fuel throughout the fuel system and lastly fogging the engine, the entire system is winterized and ready for Spring.