

E10 and Winterization

The start of football season and the need for a sweatshirt are unmistakable signs to boat owners. Fall has arrived, signaling the end of another great boating season. For many boaters, entering the fall season triggers thoughts about seasonal boat engine maintenance and the unavoidable winterization of the equipment. Winterization, the preparation of marine equipment for prolonged periods of storage (typically 2 months or more), must be completed properly to prevent rust, corrosion and damage to watercraft and marine engines. Seasonal changes in the ambient temperature can cause the freezing water or condensation to build-up inside the engine and fuel tank. Proper storage preparation is essential for keeping your marine motor trouble free and running smoothly.

The addition of ethanol does not shorten the shelf life or stability of motor fuel nor does it affect the fuels combustibility. All fuels, gasoline and E10, are susceptible to degradation such as the introduction of water or dirt that can cause the fuel to weather, leading to hard/ poor start conditions or ultimately causing engine damage. Following the engine manufacturer's recommendations for proper fuel storage condition is the best practice to preventing operational issues when needing to store fuel and engines for longer periods of time. In most cases, fuel stabilizing additives may be used to prevent fuel degradation during storage. Fuels of any composition can weather or deteriorate in storage; fuel degradation can occur in as little as 15 days.



Winterization techniques from the fuel storage perspective are typically identical for gasoline and E10 fuels with some additional warning as to water or condensation contamination for ethanol blended fuels. Having your watercraft prepared for storage by an authorized maintenance and repair facility is always the preferred method. Alternately, some boat owners choose to perform the storage and preparation of watercraft on their own. One key point for either method of winterization: Always follow the procedures and recommendations outlined in the Owner's Manual.

Winterization

Most manufacturers recommend one of two storage methods for marine fuel systems:

Dry Storage Method: Drain all the fuel from the fuel tank and operate the equipment until it stops due to lack of fuel.*

**Never start or run your marine engine without water circulating through the cooling water intake in the gear case. Cooling water prevents damage to the water pump and overheating the engine.*

Wet Storage Method: Treat the fuel with a fuel stabilizer to extend the fuel's storage life. Many equipment manufacturers sell such products under their own brand name. Once treated, fill the equipment fuel tank to 90% full. This will minimize in-tank water condensation and accumulation, while allowing room for temperature expansion. After adding a fuel stabilizer, run the engine to be sure that the treated fuel has replaced the untreated fuel.

A partially full tank is not recommended because the air space above the fuel allows air movement that can introduce water through condensation with changes in outside ambient temperature. Water introduced through this condensation action can build to a level that can cause phase separation of the fuel. Additional fuel storage recommendations specifically for your geographic location may be available from the local authorized, marine servicing dealer.

Fuel Deterioration

Ethanol and gasoline are completely miscible. If excessive moisture is introduced to the ethanol/gasoline fuel mixture, the ethanol and water can phase separate (fall out of suspension) from the fuel blend. This would result in a mixture of ethanol and water in the bottom of the fuel tank. Aside from the fact that the engine would not operate on this ethanol/ water blend, it can also cause corrosion of the various metals with which it comes in contact. Such occurrences are rare, especially if proper maintenance and storage recommendations are followed. As a regular maintenance item and prior to a boating trip, check for water contamination of the fuel tank. If any water is found, remove all water



and dry the fuel tank completely before re-fueling. Also, since some E10 can absorb moisture, it is important to have a tight fitting cap on both your equipment fuel tank and any gasoline storage containers.

Gasoline and E10 fuel blends can oxidize and deteriorate in storage leading to gummy deposits in the fuel system. Old gasoline can cause hard starting due to “weathering of the fuel,” meaning a loss of the easier vaporizing components of the fuel from evaporation. Very warm storage temperatures accelerate this type of fuel deterioration. If the gasoline in your fuel tank and carburetor deteriorates during storage, you may need to have the carburetor and other fuel system components serviced or replaced.

Note: It's important to know that phase separated fuel is impossible to correct without sophisticated engineering equipment. The phase separated material should be handled as hazardous waste and properly disposed.

Boat owners know that following proper storage guidelines and a recommended maintenance schedule will ensure the boat is kept in proper operating condition. Additional fuel storage recommendations may be available from the local authorized, marine servicing dealer.

More information about ethanol blended fuels is available at www.EthanolRFA.org.