



Fuels Safety Program	Ref. No.: FS-077-06	Rev. No.:
ADVISORY	Date: February 2006	Date:

Subject: The Compatibility of Ethanol with Fibre-Reinforced Plastic Tanks
Sent to: Posted on Web-Site and Distributed to Petroleum Council, the Ethanol and LFHC RRGs

Ontario Regulation 535/05, *Ethanol in Gasoline*, will come into effect on January 1, 2007. The Regulation requires that the gasoline pool in Ontario have an average of 5% ethanol. Prior to the legislation coming into effect, TSSA would like to make tank owners aware that some fibre-reinforced plastic (FRP) underground storage tanks are either not compatible with ethanol-enriched gasoline or may suffer structural strength degradation.

If tank owners intend to handle, store or dispense ethanol-blended gasoline, please be advised of the following information and associated requirements:

Pre-1979 FRP Tanks

Clause 2.1.1.2 of the Liquid Fuels Handling Code (LFHC), which regulates the storage, handling and transportation of liquid fuels in Ontario, specifically states that fibre-reinforced plastic (FRP) underground storage tanks manufactured prior to December 31, 1978 shall not be used to store ethanol-blended fuel. ZCL Composites Inc., currently the only manufacturer of FRP tanks in Canada, conservatively estimates that there may be as many as 120 pre-1979 tanks still in service. If you have one of these tanks, and you intend to use the tank in ethanol-blended gasoline service, you must either upgrade the tank to be compatible with ethanol-blended fuel or replace the tank.

1979 to 1986 FRP Tanks

For FRP tanks manufactured between 1979 and 1986, there is evidence that ethanol is absorbed into the walls of the tanks potentially causing a 30 to 50% reduction in structural strength. When these tanks are installed in areas with a high water table and exposed to ethanol, the decrease in structural strength may cause deformation or localized buckling in the cylindrical wall of the tank. These tanks are not predicted to fail in service (where fail is defined as a leaking tank) and there are no known tank failures in Canada or the United States attributed to the storage of ethanol-enriched gasoline regardless of the age of the tank; however, to properly address the structural strength degradation and to ensure the safe use of these tanks, TSSA reminds tanks owners of their obligation outlined in clause 2.2.2.1 of the LFHC that requires all underground tanks be equipped with an approved manual or automatic leak detection system and, if a leak is detected, clause 7.2, requires the owner to confirm the leak, determine its source and cease the use and empty the products from any leaking part of the storage tank system. The owner must notify the Director of the leak through the Spills Action Centre of the Ministry of the Environment at 1-800-268-6060.

For more information on these specific tanks and their performance, please contact ZCL at:

ZCL Composites Inc.
6907 36th St.
Edmonton, AB Canada T6B-2Z6
Phone: (800) 661-8265, (780) 466-6648
Fax: (780) 466-6126
Web Site: www.zcl.com

Lined Single-wall Steel Tanks

In some instances, single-wall steel tanks may have been lined with polyester or epoxy linings to prevent leakage. Although many of these lining materials are compatible with ethanol-gasoline blends, not all are. Some epoxy and polyester linings, which are not suitable for ethanol-gasoline blends, may deteriorate. If a tank was lined due to leakage, the leak could re-occur if the lining is chemically incompatible with the blend.

In addition to the requirements outlined above for leak detection and action upon confirmation of a leak, TSSA reminds owners of their obligation under clause 2.2.7.1 of the LFHC that requires upon leak discovery in a *lined* single-wall steel tank, the tank system shall be removed immediately and all similarly upgraded tank systems within the facility shall be removed within 180 days of the discovery of the leak.