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## State Water Resources Control Board

July 24, 2015

To: Unified Program Agencies, Underground Storage Tank Owners and Operators, and Other Interested Parties

### **COMPATIBILITY OF UNDERGROUND STORAGE TANKS STORING GASOLINE WITH ETHANOL**

California's Health and Safety Code (H&SC), chapter 6.7, sections 25292.05, 25291, 25290.2, and 25290.1 require that primary containment of underground storage tanks (USTs), installed before January 1, 1984 and USTs installed after January 1, 1984 to present, be compatible with the substance stored. Over time fuels have been reformulated and even though the constituents of the fuels are different the fuels continue to be referred to by their traditional names. Storing reformulated fuels without considering the constituents of the reformulation has become problematic because USTs that have met the requirement that the primary containment of USTs be compatible with the substance stored no longer are in compliance due to the fuel reformulation. This has led to the necessity for owners and operators of USTs to be more attentive to the mixture of the substances they are stored.

Historically, gasoline did not contain ethanol, but to protect California's air quality and to meet the Federal Clean Air Act Amendments of 1990 ethanol has been added as an oxygenate to help the gasoline burn more completely. Gasoline in California currently contains 10 percent ethanol. While tanks with steel primary containment are able to accommodate the reformulation of gasoline with ethanol, fiber reinforced plastic (FRP) tanks that previously were not approved for storing alcohol or alcohol mixtures are now storing gasoline with ethanol.

USTs installed after January 1, 1991 are required to demonstrate compatibility with the substance stored by being approved by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards. (California Code of Regulations, title 23, chapter 16, §2631(b).) An Underwriters Laboratory (UL) 1316 listing/approval satisfies the requirement; however, a UL 1316 listing/approval does not guarantee that the FRP tank is compatible with alcohol or alcohol mixtures. Only FRP tanks with a UL 1316 listing/approval that explicitly includes a rating for alcohol or alcohol mixtures are acceptable to store gasoline with ethanol.

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USTs installed before January 1, 1991 are required to demonstrate compatibility with gasoline with ethanol in one of the following ways: 1) a UL 1316 listing/approval that explicitly includes a rating for alcohol or alcohol mixtures; 2) an affirmative statement of compatibility from the manufacturer of the tank that specifies the acceptable ethanol concentration; or 3) an approval for ethanol by an independent testing organization in accordance with industry codes, voluntary consensus standards, or engineering standards.

A table is attached to assist in determining what documentation is necessary to demonstrate that an FRP tank is in compliance with the primary containment compatibility requirement of H&SC, chapter 6.7, sections 25292.05, 25291, 25290.2, and 25290.1. The table includes the most common tank manufacturers and what documentation can be used to satisfy the compatibility requirement.

If you have questions regarding compatibility of USTs please contact me at (916) 341-5668 or [cory.hootman@waterboards.ca.gov](mailto:cory.hootman@waterboards.ca.gov).

Sincerely,



Cory Hootman, P.E.  
Water Resource Control Engineer  
UST Leak Prevention Unit

Enclosure (1)

1. Ethanol Compatibility Timeline for Fiber Reinforced Plastic USTs (July 2015)

cc: Julie M. Osborn, Attorney III  
Office of Chief Counsel  
State Water Resources Control Board

# Ethanol Compatibility Timeline for Fiber Reinforced Plastic USTs<sup>1</sup>

Tank Manufacturer	Dates Manufactured	Applicable for use with Ethanol concentrations of		
		1-10% (E1-E10)	11-30% (E11-E30)	31-100% (E31-E100)
Owens-Corning Fiberglas® Corp.	Prior to Oct. 1980	None Available	None Available	None Available
Owens-Corning Fiberglas® Corp.	Oct. 1980–Jul. 1983	Manufacturers Affirmative Statement of Compatibility or UL <sup>2</sup> approval/listing for “Alcohol Mixtures” or “Alcohol”	None Available	None Available
Owens-Corning Fiberglas® Corp.	Jul. 1983–Jul. 1987	Manufacturers Affirmative Statement of Compatibility or UL approval/listing for “Alcohol Mixtures” or “Alcohol”	None Available	None Available
Owens-Corning Fiberglas® Corp.	Jul. 1987–Jan 1991	Manufacturers Affirmative Statement of Compatibility or UL approval/listing for “Alcohol Mixtures” or “Alcohol”	Manufacturers Affirmative Statement of Compatibility or UL approval/listing for “Alcohol Mixtures” or “Alcohol”	Manufacturers Affirmative Statement of Compatibility or UL approval/listing for “Alcohol”
Owens-Corning Fiberglas® Corp.	Jan. 1991–Jan. 1995	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol”
Containment Solutions, Inc. (Fluid Containment Inc.)	Jan. 1995 to Present	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol”
ZCL/Xerxes Corporation	Prior to Feb. 1981	None Available	None Available	None Available
ZCL/Xerxes Corporation	Feb. 1981–Aug. 1983	Manufacturers Affirmative Statement of Compatibility	None Available	None Available
ZCL/Xerxes Corporation	Aug. 1983–Jul. 1987	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol”
ZCL/Xerxes Corporation	Jul. 1987–Jan.1991	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol”
ZCL/Xerxes Corporation	Jan. 1991 to Present	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol”
Other Fiber Reinforced Plastic Tank Manufacturers	Prior to Jan. 1991	Manufacturers Affirmative Statement of Compatibility or UL approval/listing for “Alcohol Mixtures” or “Alcohol”	Manufacturers Affirmative Statement of Compatibility or UL approval/listing for “Alcohol Mixtures” or “Alcohol”	Manufacturers Affirmative Statement of Compatibility or UL approval/listing for “Alcohol”
Other Fiber Reinforced Plastic Tank Manufacturers	Jan. 1991 to Present	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol Mixtures” or “Alcohol”	UL approval/listing for “Alcohol”

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<sup>1</sup> UST – Underground Storage Tank

<sup>2</sup> UL – Underwriter Laboratories