

Fuel Ethanol and Underground Storage Tank Systems

Ethanol or Methanol in Oregon Fuels?

Currently, a small amount of ethanol or methanol (2.7 to 15% by volume) is blended into the gasoline we put in our vehicles in order to fulfill federal oxygenate requirements, add octane or extend the petroleum fuel supply. In Oregon, these oxygenates were initially blended into winter fuels to aid in reducing tailpipe emissions of carbon monoxide and other air pollutants in cities such as Portland, Salem and Medford-Ashland.

In the United States, ethanol is primarily produced from the starch in corn, but can also be produced from cheese whey or other grains. Ethanol can also be produced from cellulose feedstock such as wood waste, sugarcane or grasses. Methanol, on the other hand, is a fuel oxygenate derived from crude oil or natural gas.

At blended concentrations of 15% or less, fuels containing ethanol are compatible with underground storage tank systems designed to store petroleum-based fuels such as gasoline or diesel. Similarly, fuels containing ethanol are compatible with all of today's car and truck fueling systems. Since methanol is petroleum-based, there are no similar compatibility issues with the underground storage tank systems or motor vehicle fuel systems.

What is Fuel Ethanol?

Fuel ethanol on the other hand contains from 85 to 100% ethanol. Most commonly after production, ethanol is denatured or "poisoned" by adding up to 15% petroleum-based gasoline to render the alcohol unsuitable for human consumption.

Fuel ethanol is gaining popularity, particularly in the Midwest at this time, based on incentives in the Energy Policy Act (EPA) of 1992, and recent 2005 amendments, to enhance our nation's energy security and improving environmental quality. Among other objectives, EPA is designed to encourage use of alternative fuels (not substantially derived from petroleum) and renewable fuels. Ethanol, being plant based, meets both these objectives. Currently there are six retailers in Oregon selling E85. A web-based alternate fueling station locator tool is available at:

<http://www.afdc.energy.gov/afdc/locator/stations>

Is Fuel Ethanol Compatible with Current Underground Storage Tank Systems?

In most cases the simple answer is probably not. Unlike petroleum-based fuels, ethanol conducts electricity. As such, it is much more aggressive in dissolving soft metals such as aluminum, brass, zinc and lead. Once dissolved, these metals may be deposited in engines following combustion and can lead to fouling and poor engine performance. Unplated steel, stainless steel, black iron and bronze have shown acceptable resistance to ethanol corrosion. Fuel ethanol may also cause rapid deterioration of some early generation (prior to 1992) plastics, fiberglass, cork gaskets, natural rubber and leather, among other materials. Some nonmetallic materials that have been successfully used with ethanol include thermoset reinforced fiberglass, Neoprene rubber, polypropylene, nitrile and Teflon, among others.

I'd like to Sell Fuel Ethanol in Oregon, Where can I Get Help?

The US Department of Energy's Energy Efficiency and Renewal Energy Program has numerous publications and resources available at the following Website:

<http://www.afdc.energy.gov/afdc/ethanol>

The purpose of the toolkit is to assist fleet operators in:

- Evaluating the best options for their fleets,
- Learning about the equipment and technologies required to install an E85 fueling site,
- Learning about other fleets' successes and difficulties in implementing E85 infrastructure,
- Getting important contact information and resources, and
- Developing E85 (85% ethanol/15% gasoline) fueling stations.

In addition, the Department of Energy's National Renewable Energy Laboratory (NREL) and the National Ethanol Vehicle Coalition (NEVC) have developed a "Handbook for Handling, Storing, and Dispensing E85" that can viewed or downloaded from the following Website:

<http://www.afdc.energy.gov/afdc/ethanol/publica>



State of Oregon
Department of
Environmental
Quality

Land Quality Underground Storage Tank Program

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Phone: (503) 229-6704
(800) 742-7878
Fax: (503) 229-6954
Contact: Mitch Scheel
www.deq.state.or.us

[tions.html](#) . For further information on compatibility issues with tanks and piping, the Illinois State Fire Marshall has prepared a guidance document entitled *Converting Existing Underground Storage Tank (UST) Systems to be Ethanol Compatible* that can be viewed at: <http://www.state.il.us/osfm/PetroChemSaf/E85IllinoisEthanolInformation.pdf>

What DEQ Rules Apply to Installing a New “E85” Tank or Retrofitting an Existing Tank to Dispense “E85”

New UST:

- Hire a licensed Service Provider.
- Make sure all system components, including the tank, piping, spill and release detection equipment, dispenser, and dispenser nozzle are compatible with fuel ethanol (see OAR 340-150-0300 (3)).
- Submit *General Permit Registration form and 30-Day Notice* form 30 days before work starts.
- Pay new tank installation fee of \$485 per tank.
- Call Regional Office 3 days before work starts.
- Submit *UST Installation Checklist* to Regional Office after work is complete.

Modifying an Existing UST:

- Hire a licensed Service Provider.
- Make sure all system components, including the tank, piping, spill and release detection equipment, dispenser, and dispenser nozzle are compatible with fuel ethanol (see OAR 340-150-0300 (3)).
- Submit *UST System Retrofitting or Upgrading 30-Day Notice* form 30 days before work starts.
- Call Regional Office 3 days before work starts.
- Submit *UST System Retrofitting or Upgrading Checklist* to Regional Office after work is complete.

Copies of Forms can be Obtained by:

Contacting Steve Paiko, DEQ, Portland, at 503-229-6652, or leaving a message on our Help Line recording toll-free in Oregon at 1-800-742-7878, or get the forms from DEQ’s Web site at <http://www.deq.state.or.us/lq/tanks/ust/index.htm>

Contacting DEQ Regional Tank Staff

Tank Staff are available at the following offices:

In Northwest Oregon (Clatsop, Clackamas, Columbia, Multnomah, Tillamook and Washington counties):

- Portland, 2020 SW Fourth Ave., Suite 400, 503-229-5263

In Western Oregon (Benton, Coos, Curry, Douglas, Jackson, Josephine, Lane, Lincoln, Linn, Marion, Polk and Yamhill counties):

- Salem office: 750 Front St. NE, Suite 120, 503-378-8240
- Eugene office: 165 East 7th Avenue, Suite 100, 541-686-7838
- Coos Bay office: 381 N. Second Street., 541-269-2721 ext 31

In Eastern Oregon (Baker, Crook, Deschutes, Gilliam, Grant, Harney, Hood River, Jefferson, Klamath, Lake, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa, Wasco and Wheeler counties):

- The Dalles office: Columbia Gorge Community College, 400 E. Scenic Drive, Building 2, 541-298-7255

Do I Need to Contact any Other State Agencies?

Information on weights and measures, motor fuel quality and dispenser labeling are most appropriately directed to the:

Measurement Standards Division
Oregon Department of Agriculture
635 Capitol Street NE
Salem, OR 97301-2532

Telephone: 503-986-4670

Fax: 503-986-4784

Web site: <http://oregon.gov/ODA/MSD>

Do I Need to Contact any Local Agencies?

Being a flammable liquid, it is important that an “E85” storage system be installed consistent with the state or local fire code, whichever is applicable to your physical location. It is equally important that the state or local fire department know that fuel ethanol is being stored at a particular location since the characteristics of an ethanol fire are somewhat different than the characteristics of a petroleum-based fire involving gasoline or diesel. In responding to a fire, different fire suppression techniques will be employed depending on the fuel type.

Alternative formats

Alternative formats (Braille, large type) of this document can be made available. Contact DEQ’s Office of Communications & Outreach, Portland, at (503) 229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696.

