

## UNDERGROUND STORAGE TANK (UST) EQUIPMENT COMPATIBILITY & STORAGE OF BIOFUELS AND BIOFUEL BLENDS

Federal and Pennsylvania release prevention laws require that regulated underground storage tank (UST) systems be constructed or lined with material that is compatible with the substance stored. Compatibility, in this sense, refers to the ability of both the storage tank system components and the stored substance to maintain their respective physical and chemical properties upon contact with one another for the design life of the tank system.

Because the physical and chemical properties inherent to biofuels, such as ethanol and biodiesel, differ from their conventional petroleum fuel counterparts, some UST equipment and components that are compatible with conventional petroleum fuels are not compatible with biofuels or biofuel blends. Higher biofuel blends – such as gasoline-ethanol blends containing greater than 10 percent ethanol, and biodiesel-blended fuel containing greater than five percent biodiesel – can degrade many non-metallic materials, such as natural rubber, polyurethane, older adhesives, certain elastomers, and polymers used in flex piping, bushings, gaskets, meters, and filters. They can also degrade soft metals, such as zinc, brass, aluminum, lead, and copper.

Whether a UST system is newly installed or it is an existing UST system that has been converted to store a different substance, the components of the UST system must satisfy the compatibility requirement before receiving delivery of product into the UST. The following UST system components should be compatible with the substance stored:

- Tank or internal tank lining
- Spill buckets and containment sumps
- Overfill prevention equipment
- Drop tube
- Fill and riser caps
- Line leak detector
- Release detection floats, sensors, and probes
- Piping and flexible connectors
- Sealants (including pipe dope and thread sealant)
- Fittings, gaskets, o-rings, bushings, couplings, and boots
- Suction pump and components
- Submersible turbine pump and components
- Product shear valve
- Dispensers and hanging hardware

Owners and operators of USTs storing ethanol blends may use the following code to comply with the compatibility requirement:

- American Petroleum Institute Publication 1626 (API RP 1626), “Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations.”

There are a number of resources available to assist UST owners and operators in determining equipment compatibility with biofuels and biofuel blends, including:

- The Environmental Protection Agency’s Office of Underground Storage Tanks maintains information about biofuels and links to resources relevant to storing ethanol and biodiesel in USTs: [www.epa.gov/ust/alternative-fuels-and-underground-storage-tanks-usts](http://www.epa.gov/ust/alternative-fuels-and-underground-storage-tanks-usts).
- The Petroleum Equipment Institute maintains an online database that contains information on equipment compatibility with ethanol-blended and biodiesel-blended fuels. Listings include product specifications and links to manufacturers: [www.pei.org](http://www.pei.org).
- The Steel Tank Institute maintains information about biofuels storage and links to tank manufacturers’ statements of compatibility: [www.steeltank.com](http://www.steeltank.com).

In addition to the material compatibility of UST equipment with the substance stored, the functional capability of equipment used to meet the UST system operating requirements – such as overfill prevention and release detection equipment – may be dependent on the substance stored, as documented by equipment manufacturers’ product literature and performance claims, or by third-party evaluations.

The Department of Environmental Protection (DEP) recommends that UST owners and operators utilize the following checklist when installing a new UST system, or converting an existing UST system, for storage of gasoline-ethanol blends containing greater than 10 percent ethanol, or biodiesel-blended fuel containing greater than five percent biodiesel.

### **Before Biofuel is Transferred to the Tank**

- Determine storage tank system equipment compatibility with the product to be stored. Complete DEP form 2630-FM-BECB0608, *Alternative Fuel Storage Tank Installation/Conversion Form*.
- Check for water in the tank. No level of water is acceptable for gasoline-ethanol blends due to the possibility of phase separation.
- Check all visible fittings and connections at the top of the tank to ensure tightness (no vapors escape and no water enters).
- Ensure that the appropriate vent top (pressure vacuum/updraft) is present for the type of product being stored.
- Ensure that Stage I Vapor Recovery is installed and operational, if required.
- Ensure that sump and spill containment covers prevent water from entering.
- Ensure that water infiltration problems are fixed if necessary.
- Ensure that the tank has been cleaned of all water and sediment.
- Fill Labeling: identify the fill port and paint access covers according to API RP 1637.
- Dispenser Labeling: label dispenser in compliance with Federal and State regulations.
- New UST installation:** Within 30 days after installation, and prior to product delivery, submit to DEP a completed permit application 2630-PM-BECB0514, *Storage Tanks Registration/Permit Application Form*, to register the UST and apply for an operating permit. Include the completed *Alternative Fuel Storage Tank Installation/Conversion Form*.

### **First Delivery**

- Tank filled to 80 percent capacity as recommended by the Renewable Fuels Association (RFA) and kept as full as possible for seven to 10 days.
- Have dispenser calibrated prior to any retail sales.
- Conduct a precision test of the tank system (0.1 gph leak rate) with automatic tank gauge (ATG) system within seven days after tank is filled to make sure the UST system is tight and the leak detection equipment is operating properly. Investigate any "Fail" results according to the suspected release investigation requirements.
- Test for water (use alcohol compatible paste if gauging a UST storing an ethanol blend) at the beginning of each shift for the first 48 hours after delivery. If there is water in the tank – remove it, find out how it got there, and fix it so it does not occur again.
- Existing UST conversion:** Within 30 days of changing the substance stored in the UST, submit to DEP a completed form 2630-FM-BECB0607, *Storage Tank Registration Amendment Form*, to amend the UST registration information. Include the completed *Alternative Fuel Storage Tank Installation/Conversion Form*.

### **Ongoing Maintenance**

- Check regularly for water. No level of water is acceptable for gasoline-ethanol blends.
- If product seems to pump slowly, check, and replace filters.
- Calibrate the dispenser meter at the time of conversion and two weeks after conversion to verify meter accuracy. Particulate materials may cause excessive wear of the meter, which would require more frequent calibration (see API RP 1626).
- Conduct daily, visual inspections of the dispenser and dispenser sump (secondary containment) beneath the dispenser (if one is installed) and perform periodic walkthrough inspections.

#### **For additional information on Pennsylvania's Storage Tank Program or to obtain forms, contact:**

Central Office, Bureau of Environmental Cleanup and Brownfields, Division of Storage Tanks, P.O. Box 8762, Harrisburg, PA 17105-8762, 717-772-5599, 800-42-TANKS (in PA only)

For more information, visit [www.dep.pa.gov](http://www.dep.pa.gov), Businesses > Land > Storage Tanks.