

**UNDERGROUND STORAGE TANKS –
INSTALLATION REQUIREMENTS AND
SUMMARY OF RECOMMENDED DESIGN FEATURES**

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

Several considerations are important when installing a new (or upgrading an existing) Underground Storage Tank (UST) system. In some cases, the regulatory obligations can be reduced greatly by proper selection of design features. In all cases, the installation or upgrade must be conducted in accordance with the State Fire Marshal (SFM) Title 159 regulations and National Fire Protection Association (NFPA) design standards.

This SOP is limited in scope to Nebraska Title 159 requirements for fully-regulated tanks, and EPA Clean Air Act requirements for Gasoline Dispensing Facilities. The purposes of this SOP are to: 1) provide design recommendations for an UST system that is relatively inexpensive, relatively simple to maintain, and subject to the least amount of regulatory oversight; 2) summarize installation regulatory requirements and applicable UNL policies/procedures.

This SOP does not apply to UST systems that are exempt, excepted, or deferred from Title 159 regulations, such as but not limited to: USTs with a capacity of 110 gallons or less; field-constructed USTs; USTs used to store fuel solely for use by emergency power generators; and USTs used to store heating oil at the premises where the tank is located.

Design Recommendations

There are a wide-range of options for installing a petroleum storage UST. The needs of the system and the options chosen will determine how much the system will cost initially and how much work it will require to maintain.

1. Prior to installing a new UST, consideration should be given to alternatives such as natural gas, electric, or aboveground tanks. USTs should be installed only when they are determined to be essential.
2. Tanks must be constructed of coated and cathodically protected steel (often called STI-P³ tanks), fiberglass reinforced plastic over steel (often called ACT-100 tanks), or fiberglass reinforced plastic. Of these, the last two are preferred as neither must be tested/monitored for corrosion. Double-walled tanks constructed of these materials are also available. These allow for monitoring for releases in the interstitial space between the two tanks. Using non-metal construction exempts the tank from corrosion testing requirements. Fiberglass reinforced plastic tanks are not as forgiving of deformation due to ground shifts as a steel tank and are rated for

- fuel compatibility. A fiberglass reinforced plastic UST rated for diesel fuel does not make it compatible for storing gasoline.
3. Title 159 requires all piping to be of fiberglass reinforced plastic construction. That is the standard; there are not other less expensive/less regulated options. In addition to this, all underground piping must be equipped with secondary containment such as trench liners or double-walled pipe.
 4. All product lines that operate under pressure must have in-line leak detectors. Detectors must be checked and tested annually.
 5. Product lines that operate under suction must either have line tightness tests every three years or use a monthly monitoring method such as an inspection port on the down gradient end at the top of the tank.
 6. Product lines installed under the 'safe suction' standard do not require leak detection. To meet this standard the piping must:
 - a. Slope from the dispenser to the tank.
 - b. Have the pump in the dispenser (i.e., suction is used to pull fuel to the pump).
 - c. Have only one check-valve, which is installed immediately under the pump in the dispenser.
 7. USTs must be equipped with overflow control. The most common equipment for providing this are fill-pipe flappers. Fill-pipe flappers are installed in the fill pipe and close to restrict product flow when the tank reaches 95% of capacity. Due to the increased chance for overpressuring a tank, vent ball-floats are no longer allowed.
 8. Tanks must have spill control. This most readily consists of a secondary containment basin around the fill pipe. Most basins have the capacity for about 5 gallons of spilled product. Some come with a valve that can be opened to drain spilled product into the tank.
 9. All USTs require some method of release detection. There are numerous methods available some of which are based on the capacity of the tank. The system that is the simplest to operate, takes the least staff time, and is the easiest for recordkeeping is an automatic tank gauging (ATG) system. The ATG system works by an electronically monitored float in the tank. Each week the computer in the ATG system runs a test to detect if the tank is leaking. Following the test, the computer makes a printout of the result. Only one successful test per month is required under the regulations. However, most ATGs require the tank to be at least half full to run a valid test.
 10. Gasoline Dispensing Facilities USTs systems that have an average monthly dispensing volume of 10,000 gallons or more must have submerged fill pipes that are no more than 6 inches from the bottom of the storage tank to allow for submerged filling. Additional design features must be incorporated for tanks that have a throughput of 100,000 gallons or more per month.

Installation Regulatory Requirements and UNL Policies/Procedures

1. Contractor Licensing
SFM regulations require that the following activities be conducted only by licensed and/or certified tank contractors:
 - New UST or line installations, repairs, removals, or replacements.

- Cathodic protection system installations, repairs, or testing.
- Spill and overflow protection systems installations, repairs, or testing.
- Site assessments and closures.
- UST and line tightness testing.

The above activities must be conducted with prior notice to EHS, and in some cases may require the involvement of UNL FMP. Copies of contractor licenses and certifications should be maintained on-site in the tank files by the operator.

2. Permits

The contractor must apply for and obtain SFM installation and temporary operating permits at least ten working days prior to beginning installation of a new UST. A copy of the operating permit must be maintained on site and provided to EHS, upon receipt.

- The UST must meet the *Design and Installation Standards for New UST Systems* specified in Nebraska Title 159. In addition to Title 159 requirements, installation permits may also reference applicable NFPA codes and/or standards. Desired design features were discussed earlier in this SOP.
- See the EHS SOP, ***Underground Storage Tanks – Registrations, Permits, Notifications and Fees.***

3. Registration

- Most USTs must be registered with the SFM. See the EHS SOP, ***Underground Storage Tanks – Registrations, Permits, Notifications and Fees.***