

JUNE 2009

1.0 TANK SITE EVALUATION AND PREPARATION PRIOR TO INSTALLATION

- 1.1 The foundation must be designed to support the tank plus 100% of its contents when full. The foundation design shall also take into account the type of support that is being used and the point load associated with that support. The foundation may be constructed using concrete, asphalt, gravel or other stable material and must include provisions in its design to prevent tank movement. The foundation should include any provisions necessary for seismic design. The foundation design must also include provision for draining surface water away from the tank.
- 1.2 For tank installations without cathodic corrosion protection, the tank should be grounded in accordance with applicable electrical and fire code standards.
- 1.3 Where the steel tank body is in contact with the earth, use a zinc grounding rod. Do not use a copper grounding rod.
- 1.4 Where the steel tank body is in contact with the earth or foundation, it should be protected from external corrosion. For external corrosion protection using cathodic corrosion protection, consult applicable standards (i.e., National Association of Corrosion Engineers) to provide the tank with appropriate protection from lightning without interference with the corrosion protection. Steel tanks in contact with the earth should not use copper grounding. Refer to STI R893-89, "Recommended Practice for External Corrosion Protection of Shop Fabricated Aboveground Storage Tank Floors."
- 1.5 Tanks located in areas subject to flooding must be protected against floatation.
- 1.6 Aboveground tanks should not be located above underground utilities or directly beneath overhead power lines.
- 1.7 The tank shall be protected from vandalism and accidental damage in accordance with all

applicable codes, i.e., NFPA 30, NFPA 30A, UFC, etc. as well as local environmental regulations and safety codes. Consult local authorities before installing this tank.

2.0 TANK HANDLING

- 2.1 Do not handle or install the tank without having knowledge and experience in procedures involved with proper and safe installation of an aboveground tank used for storage of stable, flammable and combustible liquids.
- 2.2 Equipment for handling the tank shall be of adequate size to lift and position the tank. DO NOT DROP OR DRAG THE TANK.
- 2.3 Tanks shall be carefully handled using cables or chains of adequate length (with spreader bars, if necessary) and size. Attach to the tank using the lifting lugs provided. Care should be taken that the angle between the two cables, at the lift point, shall be no greater than 60 degrees.
- 2.4 DO NOT HANDLE OR MOVE THE TANK UNLESS IT IS EMPTY.
- 2.5 This is a stationary tank. Do not use this tank for transport of any product.

3.0 TESTING

3.1 GENERAL REQUIREMENTS

- 3.1.1 An on-site air test of the tank may be required by local authorities to ensure no damage has occurred in shipping and handling. All testing shall be done as described below.
- 3.1.2 Vacuum monitored double wall tanks are shipped from the manufacturer with a vacuum drawn on the space between the walls. Read and record the vacuum pressure. If the vacuum gauge reading is less than 12 inches Hg (40.5 kPa), contact the original tank manufacturer.
- 3.1.3 In lieu of the air pressure test described below, a vacuum may be applied to the interstice of a double-wall tank or to the interstice of a double-bottom tank. DO NOT APPLY A VACUUM TO THE PRIMARY TANK OF

A DOUBLE-WALL TANK OR TO A SINGLE-WALL TANK. A vacuum of 7" to 10" Hg is to be applied to the interstice and held for at least 24 hours with no more than a 2" Hg vacuum loss allowed. If this vacuum cannot be held for 24 hours, then perform the air test procedure described below.

- 3.1.3.1 Caution must be taken in applying a vacuum to the interstice of a tank and the testing must be stopped if any deformation appears on the tank.

3.2 AIR PRESSURE TEST PROCEDURE FOR TANKS

- 3.2.1 Remove emergency vents and cap openings to hold tank pressure as required.

NOTE: Use only calibrated air pressure gauges with a 0-15 psig (0-103 kPa) dial span. The relief valve must have a flow rate at the set pressure that is greater than the flow rate of the air supply line. The regulated air supply test pressure used for this test should be as follows:

- a. **Horizontal cylindrical tanks** - Not less than 3 psig (20.7 kPa) nor more than 5 psig (34.5 kPa). Set the pressure relief valve in the test air supply line at 5.5 psi (38 kPa).
- b. **Vertical tanks**-Not less than 1½ psig (10.4 kPa) nor more than 3 psig (20.7 kPa). Set pressure relief valve in test air supply line at 3 psig (20.7 kPa).
- c. **Rectangular tanks**-Not more than 1-1/2 psig (10.4 kPa). Set pressure relief valve in test air supply line at 1-1/2 psig (10.4 kPa).

CAUTION: Do not leave pressurized tank unattended while the pressure line/air line is connected. Do not stand in front of tank heads or fittings when pressurizing tank. Pressurizing of large tanks may result in the slight deformation of the top and bottom of vertical tanks, of the sides of rectangular tanks, and of the heads and ends of cylindrical tanks. Should deformation appear severe, immediately relieve the pressure.

3.2.2 TANK PRESSURIZING PROCEDURE

- 3.2.2.1 The following air pressure testing does not apply to double-wall tanks equipped with interstitial vacuum monitoring systems. (In lieu of the air pressure test, the tank may be shipped from the factory with a vacuum in the tank interstice. Read and record the vacuum pressure. If the vacuum pressure gauge reading is less than 12 inches Hg (40.5 kPa), contact the tank manufacturer).

- 3.2.2.2 Install test piping as shown in Figure 2. Temporarily plug, cap or seal off remaining tank openings to hold pressure.

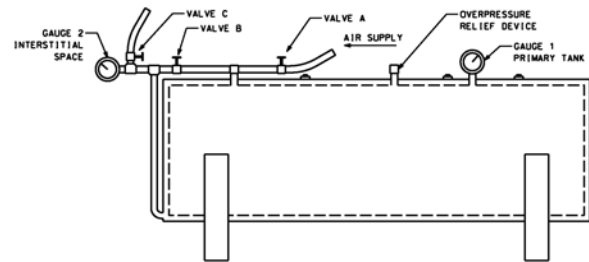


FIGURE 2
DOUBLE WALL TANK

- 3.2.2.3 Close valves A and B. Open valve C.
- 3.2.2.4 Connect the regulated test air supply line to test piping as shown in Figure 2.
- 3.2.2.5 Slowly open valve A to pressurize the primary tank. Pressure gauge 1 should indicate test air pressure given in Section 3.2.1 above.
- 3.2.2.6 Close valve A. Disconnect the regulated test air supply line from the test piping.
- 3.2.2.7 Monitor test pressure in the primary tank for 1 hour minimum. A steady drop in pressure reading for gauge 1 indicates there may be a leak in the primary tank. Check the fittings, the gauge, and then retest. If the problem persists, contact the tank manufacturer.
- 3.2.2.8 If no leaks are found, close valve C and slowly open valve B to pressurize the interstitial space between the double walls of the tank. **WARNING:** Do not apply air pressure to the interstitial space between the walls of a double wall tank without air pressure in the primary tank. Do not apply air pressure to the interstitial space that is higher than the air pressure in the primary tank. Damage to the tank may result. Pressure gauge 1 will indicate a slight drop in test pressure when valve B is opened, but should hold steady at the lower pressure. If the test pressure drops below the minimum requirements, close valve B, reconnect the air supply line and slowly open valve A to increase the pressure in the primary tank. When the required pressure is indicated on gauge 1 close valve A, disconnect the test air supply line. Open valve B to equalize pressure in the primary tank and the interstitial space. Gauge 1 and gauge 2 should have the same pressure reading.

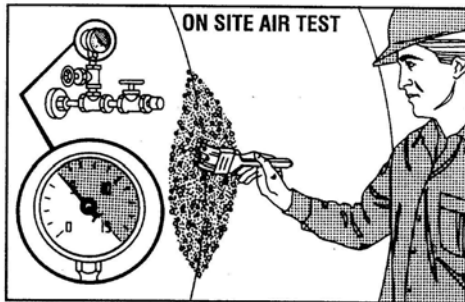
3.2.2.9 Close valve B. Hold the test pressure in the interstitial space for 1 hour minimum. A steady drop in pressure gauge 2 indicates there may be a leak in the interstitial space. Check the fittings, the gauges, and then retest. If the problem persists, contact the tank manufacturer.

3.2.2.10 Proceed to Section 3.2.3, "Detection of Leaks" below.

3.2.3 DETECTION OF LEAKS

3.2.3.1 Immediately apply the leak test solution to the tank exterior surfaces, welds, fittings, etc. Check for leaks. No leaks are allowed. If leaks are found, notify the tank manufacturer. If no leaks are found, testing of the tank is complete.

3.2.3.2 Open valve C, then slowly open valve B to release the test air pressure.



3.2.3.3 With the tank depressurized, remove the test piping, temporary plugs, caps and seals. Reinstall the emergency relief vents, etc. which were removed in Section 3.2.1 above. Emergency vents are required on both the primary tank and the secondary tank. **WARNING:** Emergency relief vents must be operable to prevent causing tank failure by over-pressurization.

4.0 TANK PIPING AND ACCESSORIES

4.1 Install all permanent piping and fittings using compatible, non-hardening thread sealant material.

4.2 All unused tank openings must be properly sealed and tested to be liquid and vapor tight prior to putting the tank into service.

4.3 **DO NOT WELD ON THE TANK, MODIFY OR PENETRATE THE TANK STRUCTURE IN ANY WAY WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE TANK MANUFACTURER.**

4.4 All tank accessories shall be installed as required per local codes. Anti-siphon devices,

overflow shut-offs and alarms, vents gauges, emergency vents, etc. are common requirements for tanks storing motor fuels for the purpose of being dispensed into motor vehicles.

5.0 LABELING

5.1 Tanks shall be labeled in accordance with all applicable codes.

6.0 MAINTENANCE

6.1 The tank operator should perform periodic walk-around inspections to identify and repair areas of damage to the vessel or the coating itself and check for proper drainage around the tank area.

6.2 It is imperative that the tank exterior be inspected periodically to ensure that the integrity of the coating is maintained. The frequency of periodic repainting will be based upon environmental factors in the geographic area where the tank is located. Special consideration should be given to the selection of the paint, surface preparation and coating application. The coating selected should be suitable for use with the current coating, or the existing coating should be removed. The coating selected should be of industrial quality.

6.3 Proper site preparation and maintenance are vital to ensure drainage of surface water. Should ground conditions change or settlement occur, take the appropriate steps to maintain proper drainage and prevent standing water near or under the tank area.

6.4 The primary tank shall be inspected monthly for the presence of water at the lowest possible points inside the primary tank. Remove any water found. Water and sediment in fuel can cause plugging of filters. Also, bacterial growth, originating from the fuel can cause corrosion of tanks and lines. For procedures on how to check for the presence of water and removal of water, refer to API Recommended Practice 1621, Appendix D and API Standard 2610. Another source of information is a report by the US Department of Energy Brookhaven National Laboratory, BNL 48406, which provides information on methods to test for and remove water, test for bacterial presence in fuel, tank cleaning and fuel additives.

- 6.5 This tank must be removed from service if damaged by fire exposure, other physical means or misuse.
- 6.6 Failure to adhere with these maintenance instructions may void your warranty.
- 6.7 Tank relocation requirements - often aboveground storage tanks are relocated. The following instructions are to be followed when this occurs: All steps are to be documented and the documentation is to be kept for the life of the tank.
 - 6.7.1 The hazards associated with the cleaning, entry, inspection, testing, maintenance or other aspects of ASTs are significant. Safety considerations and controls should be established prior to undertaking physical activities associated with ASTs. Cleaning of tanks must be per state and local jurisdiction requirements.
 - 6.7.2 Refer to the STI Standard SP001, "Standard for the Inspection of Aboveground Storage Tanks" for requirements concerning tank inspections. This SP001 Standard details requirements for inspections based on the tank installation and age. A tank must undergo the appropriate inspection prior to relocation.
 - 6.7.3 In addition, the tank must be subjected to a pressure (or vacuum) test as detailed paragraph 3.2 above except an inert gas, such as nitrogen, should be used for tanks that have previously held fuel.

DISCLAIMER

These instructions are intended only as an aid to tank installers who are knowledgeable and experienced in aboveground tank installation. Compliance herewith does not necessarily meet the requirements of applicable federal, state and local laws, regulations and ordinances concerning tank installation. STI makes no warranties, express or implied, including but not limited to, any implied warranties of merchantability or fitness for a particular purpose, as a result of these installation instructions.

Contact STI for the latest version of these Installation Instructions or visit the STI website at www.steeltank.com.