

# TITAN<sup>®</sup> Double-wall Underground Tank Installation Instructions



**Please read completely before installing a tank.**

## Permitting

Check with local authorities for permitting process and requirements. Obtain proper permit(s) before installing this tank.

## Excavation and Bedding

The excavation shall be free from any hard or sharp material that may cause damage to the tank. Maximum depth of burial is 5 feet from top of tank to grade.

Bedding and backfill shall be homogeneous material consisting of clean sand, pea gravel, No. 8 crushed stone (No. 8 Coarse aggregate per ASTM-D448, 1/2 inch maximum size) or equivalent.

The bottom of the excavation shall be covered with a minimum of 12 inches of bedding (305 mm), suitably graded and leveled. The excavation shall extend at least 18 inches (458 mm) around the perimeter of the tank.

Where anchoring by means of a concrete pad is required, the tank shall not be placed directly on the pad. A layer of clean bedding material at least 6 inches (152 mm) deep must be spread evenly over the dimensions of the pad to separate the tank from the pad. The tank shall not be placed on any hard or sharp material or saddles.

In a tidal area, the tank "bedding" material shall be crushed stone or pea gravel. Sand backfill may be used only if measures are taken to prevent washout of sand and prevent the infiltration of native soil into the backfill during the design life of the system.

## Job Site Testing

EACH Highland Tank is carefully tested before shipment; however, transportation and handling may cause a defect that was not present at the time the tank was factory tested. All National and State Codes and Highland Tank require testing at the job site by the installer BEFORE INSTALLATION. TITAN<sup>®</sup> double-wall underground tanks are shipped from the factory with a vacuum drawn on the

interstice. Upon delivery, with the vacuum still intact, further above ground tightness testing may be redundant, unless required by the authority having jurisdiction. Allowing a small amount of air into the interstice by opening the valve on the gauge assembly will demonstrate that the gauge is operating.

## Tank Handling

Equipment to handle the tank shall be of adequate size to lift and lower the tank without dropping, dragging or rolling to prevent damage to tank.

The tank may arrive with factory installed removable lifting lugs for tank handling. Make sure lifting lugs are tightly secured to the tank and positioned properly, parallel to the longitudinal center line of the tank, before using.

The tank shall be carefully lifted and lowered into the excavation hole by use of cables or chains of adequate length attached to the lifting lugs provided. A spreader bar shall be used where necessary. Do not use slings, chains or cable around the tank to lift it. Do not drop, roll, or drag tank.

The angle between the vertical and one side of the lifting cable must not exceed a 60-degree included angle. Lift tank only at designated lift points with the lift lugs provided. Lift points are designated either by a sticker or by the presence of a lifting device.

Care shall be taken to prevent impact of the tank with any objects which can damage the tank, including concrete pads, deadman anchors, other tanks, tools and compaction equipment. Use of tank guidelines attached to lift lugs will provide a means of manually controlling tank movement and placement. Do not attach guidelines to the vacuum test station.

Do not store or place tank on sharp objects or debris. Use nonabrasive cushion-type chock (i.e., rubber tires) to prevent tank movement during storage. For high wind conditions, the tank should be tied down using nonmetallic straps.

## Tank Storage

If the tank must be temporarily stored prior to installation, it should be placed in an area away from activity where tank damage could occur. If the tanks are to be stored outdoors for more than 60 days, it should be covered with a tarp or other similar material. If the tank is stored for more than 90 days above ground, recertification may be necessary. Please call factory for assistance.

## Anchoring Tank

High water tables or partially flooded excavation sites exert significant upward buoyant forces on tanks. Buoyant forces are partially resisted by the weight of the tank, the backfill and the pavement on top of the tank. Additional buoyant restraint, when required, is obtained using properly designed hold-down straps in conjunction with concrete hold-down pads or deadman anchors. The use of steel cable and round bar as hold-down straps on the tank is prohibited.

Ballasting the tank may be necessary. When water is used as the ballast material, it shall only be potable water and shall not remain in the tank longer than 60 days. During construction, adequately vent all tank spaces. If product is used as ballast, proper precautions must be taken to prevent fires, spills, leaks, and other associated accidents. Monitor product level frequently to ensure there has been no unaccounted loss of product.

Special care should be taken when installing steel hold-down straps to ensure that the straps are separated from the tank by protective inert padding materials. The padding should be 2 inches (50.8 mm) wider than the hold-down straps, or wrap around the hold-down straps, to prevent direct strap contact with the tank's polymer shell. Use of fabric hold-down straps is strongly recommended.

The hold-down straps at the end of the tank shall be located at a distance of not more than L/10, where L is the tank length. The remaining hold-down straps shall be spaced out approximately equally.

**Backfill**

Homogeneous backfill similar to bedding material shall be placed carefully around the entire tank to create a uniform homogeneous environment.

Special care shall be taken when installing backfill along the bottom sides of the tank to ensure that the tank is not damaged and is fully and evenly supported around the bottom quadrant.

The backfill material shall be carefully placed and consolidated along the bottom, under the tank shell, by manually shoveling and tamping.

The initial 2 feet (609.6 mm) of backfill shall be completed in 12-inch (304.8 mm) maximum lifts, uniformly placed around the tank. Light hand-operated compaction equipment is recommended for all sand backfills to at least 3 feet (914.4 mm) above the tank.

**Tank Piping Connection Test**

Remove all factory-installed thread protectors and replace with permanent piping or plugs.

Pressure applied to the tank shall be 3-5 psig (34.47 kpa). Shut off the compressed air source to the system. A soap solution shall be applied around all tank piping connections while test is being performed. Bubbles and/or foam indicate leakage.

After passing leak testing, release tank air pressure by allowing it to escape slowly through the connection used to pressurize the tank.

**Final Backfill**

Homogeneous backfill shall be deposited carefully around the tank up to top of tank and to a depth of at least one foot (304 mm) over the tank to avoid damage to polymer shell, especially where tamping is required. (See NFPA 30 or UFC and state or local codes for minimum depth of cover required prior to allowing vehicular traffic over the tanks.)

Some of the specifications and recommended practices in this publication have been contributed by the industry organizations listed below:

**Petroleum Equipment Institute (PEI)**

Recommended practices for installation of Underground Liquid Storage Systems PEI/RP 100.

**American Petroleum Institute (API)**

Installation of Underground Petroleum Storage Systems

**NOTE:** Striker plates are provided under each opening for added protection. Titan tanks are for the storage of unheated product only. The temperature of any tank component or contents cannot exceed 100° F. For high-temperature storage applications, we recommend using the Highland HotShot Heated Product Storage Tank.

**National Fire Protection Association (NFPA)**

Flammable and Combustible Liquids Code NFPA 30-1996.

**International Fire Code Institute**

Uniform Fire Code.

**TITAN Underground Composite Tank Installation Checklist**

\_\_\_\_\_  
Tank Owner  
Address

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Titan Tank U.L. Label No.: \_\_\_\_\_

Tank Capacity: \_\_\_\_\_

Tank Dimensions:

Diameter: \_\_\_\_\_Inches,

Length: \_\_\_\_\_ft., \_\_\_\_\_in

Delivery Date: \_\_\_\_\_

Installation Date: \_\_\_\_\_

Product to be stored: \_\_\_\_\_

Handling

Lift equipment used: \_\_\_\_\_

\_\_\_\_\_

Lifting capacity (lbs.): \_\_\_\_\_

Type of chocks used if tank stored: \_\_\_\_\_

\_\_\_\_\_

Describe any damage observed: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Testing

Pre-installation test completed: \_\_\_\_\_  
(Initial)

Excavation (feet & inches)

Length \_\_\_\_\_ Width \_\_\_\_\_ Depth \_\_\_\_\_

Burial depth \_\_\_\_\_ Top of tank to grade \_\_\_\_\_  
Inches 18 inches minimum around each tank?

Yes  No

Burial depth meets minimum code requests (such as NFPA 30 or UFC)

Anchoring (Check one)

No pad at this site

Deadman anchors

Concrete pad

Soil and pavement overburden used to hold down tank. \_\_\_\_\_ Feet of bedding material when concrete pad is used

If hold-down straps were used, straps were attached to:

Concrete  Pad

Deadman  Other

Describe other: \_\_\_\_\_

Number of hold-down straps \_\_\_\_\_

Width \_\_\_\_\_ Inches

Protective padding material used : \_\_\_\_\_

Backfill Material

Clean Sand  Pea gravel

#8 Stone

Depth of homogeneous material beneath tank:

\_\_\_\_\_ Inches

Backfill placed to assure full support along bottom quadrant of tank. \_\_\_\_\_

Initial

Tank Piping Connection Test

All pipe fittings to tank tested at 5 psig (34.47 kpa) while applying soap solution onto fittings to check for leaks?  Yes  No

Precision test system gauge reading

at \_\_\_\_\_ Inches

Date \_\_\_\_\_

Signature of installing foreman or project engineer X \_\_\_\_\_

*Installer return original copy of this checklist to the tank owner listed above and retain a copy for your permanent files.*

*Note: This checklist includes key steps in the proper installation of a double-wall underground storage tank with polymer secondary containment and is intended only as an aid to tank installers who are knowledgeable and experienced in underground tank installation. Compliance herewith does not necessarily meet the requirement of all applicable federal, state and local laws, regulations and ordinances concerning tank installation.*

*Tank owner: A copy of this checklist should be returned to you by the installer for retention with your permanent records.*

Please visit us at [www.highlandtank.com](http://www.highlandtank.com)



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