

Fiberglass Underground Tanks For Landfill Leachate and Chemical Applications

As consumers and industries become increasingly accountable to meet ecological requirements for underground collection and storage of products and materials, Xerxes Corporation is in the forefront with innovative solutions.

Xerxes fiberglass-reinforced plastic (FRP) double-wall tanks offer a superior option for underground collection of landfill leachate, and for underground collection and storage of specific chemicals. Manufactured of high-quality resin and glass, Xerxes tanks have a unique integral-rib design, making them structurally strong yet lightweight. They are, therefore, easy to ship and easy to install. Rustproof and long-lasting, Xerxes offers customers a maintenance-free, cost-effective fiberglass tank for leachate and chemicals.

An additional feature of Xerxes leachate and chemical tanks is the premium resin used in the fabrication of the tank's inner surface. To determine application suitability, a Xerxes Underground Chemical Tank (UCT) Application must be completed for each application, listing the composition of the leachate to be collected or the list of chemicals to be collected and stored.

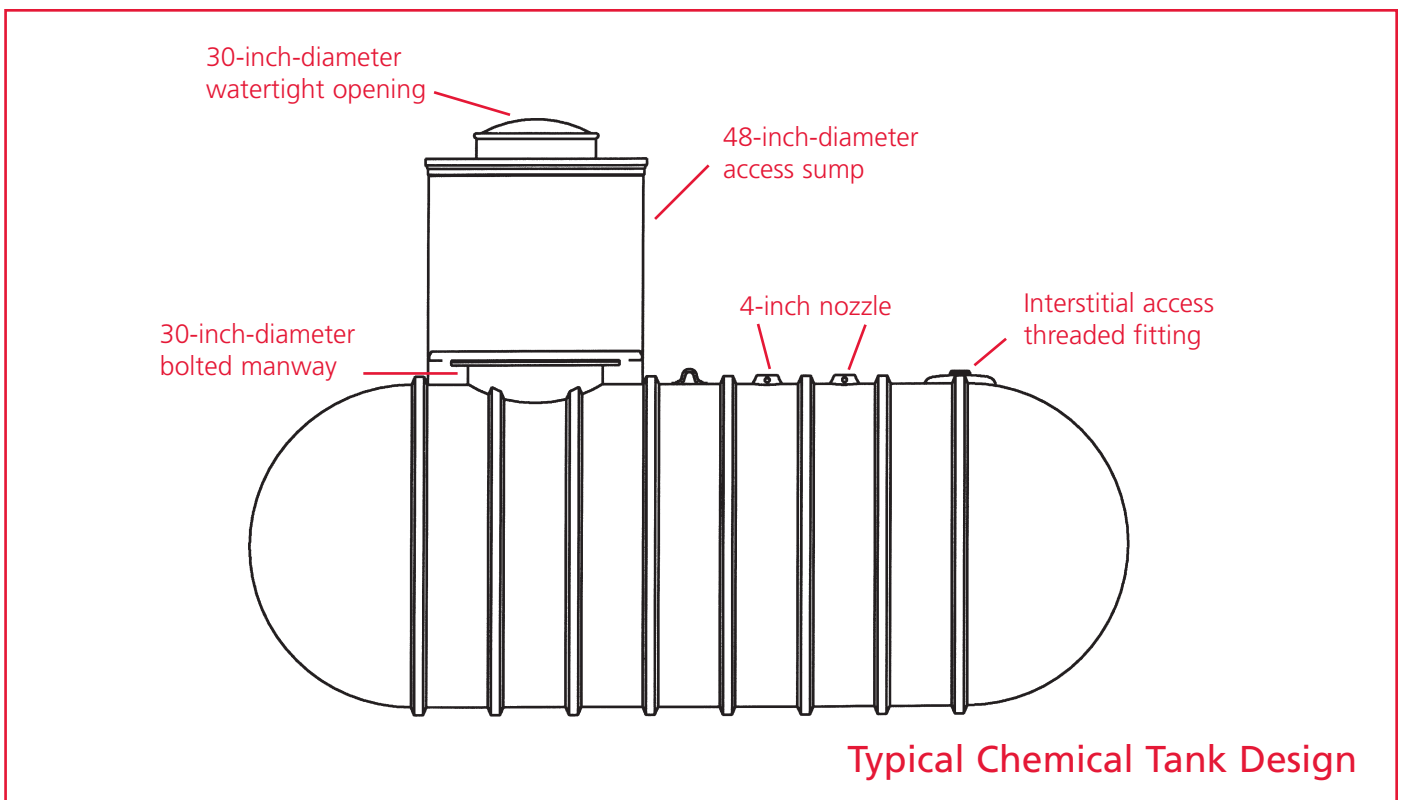
Xerxes' four manufacturing facilities, strategically located throughout the United States, give customers prompt delivery and

quality service. The custom-designed tanks Xerxes manufactures for landfill leachate and chemicals offer customers great flexibility for their needs.

Typical Applications *

- Airport deicing (glycol storage)
- Aqueous film forming foam storage
- Medical emergency drain collection
- Irrigation systems collection
- Emergency drain collection in industrial facilities
- Refinery runoff
- Road treatment chemicals
- Paint manufacturing
- Municipal solid-waste landfills
- Industrial solid-waste landfills
- Agricultural solid-waste landfills

* All applications require prior approval.



Features

- Premium resin used for tank's inner surface
- Rustproof, long-lasting fiberglass
- Integral-rib design for added strength and robustness
- Easy to ship and easy to install
- Testable onsite and underground
- Manufactured to applicable requirements of UL 1316
- Gauge plates under all openings
- Able to be reinstalled after recertification
- Double-wall and triple-wall models
- 600-gallon to 40,000-gallon sizes

Optional Accessories

- 30" - and 36" -diameter manways (22" -diameter is standard)
- Manway extensions (various lengths)
- Fiberglass manway covers
- Stainless-steel manway bolting hardware
- Flanged and gusseted nozzles
- Ladders (FRP or aluminum)
- FRP hold-down straps
- Pump platforms
- FRP fill tubes
- Reinforced-concrete deadmen

Guide Specifications

Double-Wall FRP Tank for Landfill Leachate or Chemical Use

Short Form:

The contractor shall provide double-wall fiberglass-reinforced plastic (FRP) underground storage tank as shown on the drawings. The tank size, fittings and accessories shall be as shown on the drawings. The fiberglass tank shall be manufactured by Xerxes Corporation.

Tank shall be tested and installed according to the Xerxes Installation Manual and Operating Guidelines for Single-Wall and Double-Wall Fiberglass Underground Storage Tanks in effect at time of installation.

Long Form:

Part I: General

1.01 Quality Assurance

A. Acceptable Manufacturer: Xerxes Corporation

B. Governing Standards, as applicable:

1. Manufacturer shall be able to provide documentation that the tank has been built to the applicable requirements of Underwriters Laboratories Standard UL 1316.
2. Tank manufacturer shall be in the business of manufacturing tanks to UL 1316 standards.

Part II: Products

2.01 Double-Wall Fiberglass Reinforced Plastic (FRP) Underground Storage Tanks

A Loading Conditions –Tank shall meet the following design criteria:

1. Internal Load: Tank shall withstand a 5-psig air-pressure test with 5:1 safety factor. Installer shall test each tank for leakage prior to installation. Maximum test pressure is 5 psig.
2. Vacuum Test: To verify structural integrity, each tank shall be vacuum tested by the manufacturer at the factory to 11.5 inches of mercury.
3. Surface Loads: Tank shall withstand surface H-20 axle loads when properly installed according to manufacturer's current Installation Manual and Operating Guidelines.
4. External Hydrostatic Pressure and Burial Depth: Tank shall be capable of being buried in ground with 7 feet of overburden over the top of the tank, the hole fully flooded and a safety factor of 5:1 against general buckling.
5. Tank shall support accessory equipment – such as drop tubes, submersible pumps and ladders – as shown on tank drawings and when installed according to tank manufacturer's recommendations.

B. Product Storage:

1. Tank shall be capable of storing leachate or chemicals with specific gravity up to 1.1.

2. Tank shall be vented to atmospheric pressure.

C. Materials:

1. Tank shall be manufactured of 100% resin and glass-fiber reinforcement. No sand fillers.
2. Premium resin shall be used in fabricating the inner surface of all landfill leachate and chemical tanks.

D. Tank Dimensions (Refer to Xerxes literature on gallonage):

1. Tank shall have nominal capacity of _____ gallons.
2. Tank shall have nominal outside diameter of _____ feet.

E. Service Conditions and Requirements:

1. For each landfill leachate tank, a Xerxes Underground Chemical Tank (UCT) Application form, which shall include the composition of landfill leachate to be collected in the tank, shall be completed and submitted to Xerxes for approval prior to manufacturing.
2. For each chemical tank, a Xerxes Underground Chemical Tank (UCT) Application form, which shall include the list of chemical products to be stored in the tank, shall be completed and submitted to Xerxes for approval prior to manufacturing.
3. Approval for each application of the tank, any limitations on use and any design considerations shall be provided by Xerxes.
4. When approved, the completed form is returned to the customer and becomes "Exhibit A" of the Xerxes Limited Warranty for Underground Chemical Tanks.

F. Interstitial Space:

1. Tank shall have a space between the primary and secondary walls to allow for the free flow and containment of leaked product from the primary tank. The space also allows the insertion of a monitoring device through a monitoring fitting.

2.02 Accessories

A. Optional Hydrostatic Leak Monitoring System:

1. The tank manufacturer shall offer the option of a continuously monitored, hydrostatic head-pressure, leak-detection system, to include an interstice factory-filled with monitoring fluid, and a fiberglass reservoir mounted directly on top of the tank to provide for continuous monitoring of the fluid level.
2. The leak-monitoring system shall be designed by the manufacturer to detect a leak in either the primary or secondary tank, at installations with or without groundwater.
3. The hydrostatic monitoring system shall be UL third-party verified and shall meet EPA criteria for tank-tightness testing through the use of TRUCHEK®. (For further information, refer to the Xerxes document on TRUCHEK®.)

B. Optional Anchor Straps:

- 1. Straps shall be FRP anchor straps as supplied by tank manufacturer.
- 2. Number and location of straps shall be specified in current literature by tank manufacturer.

C. Manways:

- 1. All tanks for leachate or chemical use shall require at least one manway.
- 2. All manways shall be flanged and 22-inch-diameter, complete with UL-listed cover, gasket and hardware. (30-inch- and 36-inch-diameter manways are also available.)
- 3. Location is shown on tank drawings.
- 4. Optional manway extensions shall be FRP.

D. Gauge Plates:

- 1. Gauge plates shall be installed under each fitting and manway opening.

E. Optional Ladders:

- 1. Ladders shall be the standard ladder as supplied by tank manufacturer.
- 2. Ladder material (fiberglass or aluminum) shall be as shown on tank drawings.

F. Internal Optional Pump Platform:

- 1. Contact tank manufacturer with pump details.

G. Fittings:

- 1. All fittings shall be located along the top centerline of the tank. Bottom drain and tangential nozzles are not allowed.
- 2. All standard NPT threaded fittings shall be constructed of carbon steel.
- 3. All standard NPT threaded fittings shall be half-couplings, and of 2-

- inch, 4-inch or 6-inch diameter. Reducers are to be used for smaller sizes where shown and provided by contractor.
- 4. All NPT fittings shall withstand a minimum of 150 foot-pounds of torque and 1,000 foot-pounds of bending, both with a 2:1 safety factor.
- 5. All optional FRP nozzles shall be flat-faced, flanged and gusseted, and shall be available in 2-inch, 4-inch, 6-inch and 8-inch diameters.
- 6. All optional FRP nozzles shall conform to ANSI B16.5 150-pound bolting pattern.
- 7. Each interstitial space monitor fitting shall consist of a 4-inch NPT fitting on the secondary tank.

Part III: Testing and Installation

3.01 Testing

- A. Tank shall be tested according to the Xerxes Installation Manual and Operating Guidelines for Single-Wall and Double-Wall Fiberglass Underground Storage Tanks in effect at time of installation.

3.02 Installation

- A. Tank shall be installed according to the Xerxes Installation Manual and Operating Guidelines for Single-Wall and Double-Wall Fiberglass Underground Storage Tanks in effect at time of installation
- B. Contractor shall be trained by the tank manufacturer, the state or other approved agency.

Part IV: Warranty

4.01 Warranty

- A. Warranty shall be manufacturer’s standard limited warranty for underground chemical tanks in effect at time of purchase.

Double-Wall Tank Chart

Nominal Diameter	Nominal Capacity (gallons)	Actual Length	Nominal Weight (pounds) *	
			Dry	w/Monitoring Fluid
4'	600	7'-3 1/2"	800	1,000
4'	1,000	11'-7 1/2"	1,100	1,400
6'	2,500	13'-5 3/4"	1,800	2,400
6'	3,000	16'-4 1/4"	2,100	2,800
6'	4,000	20'-8"	2,500	3,500
6'	5,000	26'-5"	3,100	4,300
6'	6,000	30'-8 3/4"	3,600	4,900
8'	4,000	15'-1/2"	2,200	3,100
8'	5,000	17'-8 1/2"	2,600	3,700
8'	6,000	20'-6 1/2"	2,900	4,300
8'	8,000	26'-1/2"	3,600	5,400
8'	10,000	31'-6 1/2"	4,300	6,600
8'	12,000	37'-1/2"	5,000	7,700
8'	15,000	46'-9"	6,400	9,800
10'	10,000	21'-5 1/4"	4,500	6,200
10'	12,000	24'-1/4"	5,000	7,000
10'	15,000	29'-5 3/4"	6,100	8,600
10'	20,000	37'-8 3/4"	7,700	11,000
10'	25,000	47'-6 3/4"	10,000	14,300
10'	30,000	55'-9 3/4"	11,900	17,000
10'	35,000	64'-3/4"	13,600	19,600
10'	40,000	73'-8 1/4"	16,000	23,000

* Adding accessories to the tank may increase the tank weight.

Limited Warranty Underground Chemical Tanks

Xerxes Corporation ("Xerxes") warrants to ("Owner") that our underground chemical tanks, if installed, used and maintained in the United States in accordance with Xerxes' published specifications, installation instructions and operating guidelines, and all applicable laws and regulations, and the limited chemical applications provided by Xerxes' customer in Exhibit A attached hereto, at temperatures not to exceed 100° F, will be free from material defects in materials and workmanship for a period of one (1) year from date of original delivery by Xerxes.

This warranty is limited by the provisions of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA or "Superfund") which designates certain chemicals as "hazardous substances." See 42 United States Code, § 9601(14). The United States Environmental Protection Agency, Office of Underground Storage Tanks (U.S. E.P.A.) requires that new underground chemical tanks that store "hazardous substances" have secondary containment and interstitial monitoring. See 40 Code of Federal Regulations, § 280 and 281. THIS WARRANTY IS NULL AND VOID IF A SINGLE WALL TANK HAS BEEN USED FOR PRODUCTS CONTAINING A "HAZARDOUS SUBSTANCE" WITHOUT USE OF SECONDARY CONTAINMENT AND INTERSTITIAL MONITORING.

Xerxes warrants to Owner that all Xerxes manufactured chemical tank accessories, if installed, used, and maintained in the United States in accordance with Xerxes' published specifications, installation instructions and operating guidelines, and all applicable laws and regulations, and the limited chemical applications provided by Xerxes' customer in Exhibit A attached hereto, at temperatures not to exceed 100° F, will be free from material defects in materials and workmanship for a period of one (1) year following the date of original delivery by Xerxes.

If any tank is to be removed from an installation, moved to Owner's new location and is intended for active service at the new location, the tank must, in addition to inspection, be recertified by Xerxes in order to maintain the warranty as originally extended. The foregoing warranty does not extend to tanks or accessories (collectively "Goods") damaged due to acts of God, war, terrorism or failure of Goods caused, in whole or in part, by misuse, improper installation, storage, servicing, maintenance, or operation in excess of their rated capacity or contrary to their recommended use, whether intentional or otherwise, or any other cause or damage of any kind not the fault of Xerxes. Xerxes only warrants repairs or alterations performed by Xerxes or its authorized contractors. Xerxes does not warrant any product, components or parts manufactured by others.

Owner's sole and exclusive remedy for breach of warranty is limited at Xerxes' option to: (a) repair of the defective tank or accessory, (b) delivery of

a replacement tank or accessory to the point of original delivery, or (c) refund of the original purchase price. A claimant must give Xerxes the opportunity to observe and inspect the tank and/or accessory prior to removal from the ground or the claim will be forever barred. All claims must be made in writing within one (1) year after tank and/or accessory failure or be forever barred. THE FOREGOING WARRANTY CONSTITUTES XERXES' EXCLUSIVE OBLIGATION AND XERXES MAKES NO OTHER WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, WITH RESPECT TO THE GOODS, OR ANY SERVICE, ADVICE, OR CONSULTATION, IF ANY, FURNISHED TO OWNER BY XERXES OR ITS REPRESENTATIVES, WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE. THE SELLER (XERXES) UNDERTAKES NO RESPONSIBILITY FOR THE QUALITY OF THE GOODS, EXCEPT AS OTHERWISE PROVIDED IN THIS CONTRACT. THE SELLER (XERXES) ASSUMES NO RESPONSIBILITY THAT THE GOODS WILL BE FIT FOR ANY PARTICULAR PURPOSE FOR WHICH YOU (OWNER) MAY BE BUYING THESE GOODS, EXCEPT AS OTHERWISE PROVIDED IN THE CONTRACT. THE REMEDIES SET FORTH IN THE ABOVE WARRANTY ARE THE ONLY REMEDIES AVAILABLE TO ANY PERSON OR ENTITY FOR BREACH OF WARRANTY OR FOR BREACH OF ANY OTHER COVENANT, DUTY, OR OBLIGATION ON THE PART OF XERXES. XERXES SHALL HAVE NO LIABILITY OR OBLIGATION TO ANY PERSON OR ENTITY FOR BREACH OF ANY OTHER COVENANT, DUTY, OR OBLIGATION UNDER THIS WARRANTY EXCEPT AS EXPRESSLY SET FORTH HEREIN. IT IS EXPRESSLY AGREED THAT THIS WARRANTY DOES NOT FAIL OF ITS ESSENTIAL PURPOSE. XERXES SHALL HAVE NO LIABILITY FOR TANK INSTALLATION OR REMOVAL COSTS, ENVIRONMENTAL CONTAMINATION, FIRES, EXPLOSIONS OR ANY OTHER CONSEQUENCES ALLEGEDLY ATTRIBUTABLE TO A BREACH OF WARRANTY, OR INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR OTHER DAMAGES OF ANY DESCRIPTION, WHETHER ANY SUCH CLAIM OR DAMAGES BE BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER TORT, OR OTHERWISE. IN NO EVENT SHALL XERXES' TOTAL LIABILITY HEREUNDER EXCEED THE ORIGINAL PURCHASE PRICE OF THE GOODS WHICH GAVE RISE TO SUCH LIABILITY.

Consumer Notice: This warranty gives you (Owner) specific legal rights. You (Owner) may also have other rights which vary from state to state.

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