

Highland Underground Steel Storage Tanks



Working Toward a Safe, Clean Environment.



Highland Tank

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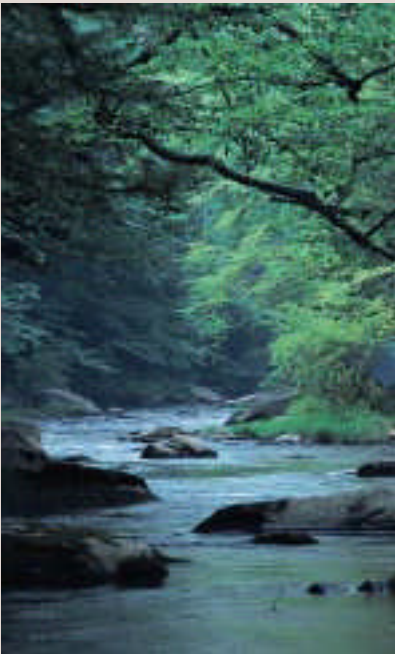
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Service, Quality & Delivery at Competitive Prices

We are proud to offer you the security of decades of full service with over one half billion gallons of steel tanks manufactured since 1946 that are protecting our nation's natural resources. Each tank is backed by Highland Tank's team of professionals in design, engineering, fabrication, delivery and service.

Highland underground steel tanks provide superior structural strength, product compatibility and durability for all your storage tank needs. Highland offers a variety of industry-proven corrosion protection systems for our single and

Protection Agency's regulations for underground storage tanks for petroleum and chemical products.

Highland steel tanks are compatible with all motor fuels used today, including those with higher methanol and ethanol contents. Our steel tanks are the best choice for your liquid storage needs including: commercial fuel oils, aviation fuel, chemicals and potable water.

Highland is recognized throughout the tank industry for its reputation of on-time delivery of high-quality tank products by our professional drivers experienced with tank handling.

With a Highland tank, you get the proven

The Highland Advantage

double-wall tanks. All Highland underground steel tanks are warranted for 30 years.

Highland offers the security of a diversified product line and extensive fabrication capabilities, backed by a sound company with over 50 years of private ownership and management.

Each tank is constructed, tested, and labeled in accordance with Underwriters Laboratories Standard for Safety for the Underground Storage of Flammable and Combustible Liquids. All Highland tanks meet or exceed the Federal Environmental

designs and steel construction required to withstand the rigors of the underground environment. In addition, you have the flexibility of customizing the tank's fittings, dimensions and compartments to suit your individual needs.

Our tanks are competitively priced and readily available from strategically located regional distributors and manufacturing facilities. Highland can effectively provide you with environmentally safe, structurally sound, underground storage tank solutions throughout the 21st century and beyond.

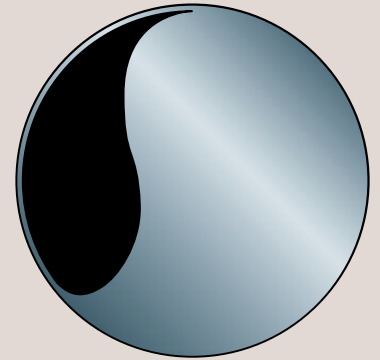
Steel Is The Choice

No other tank fabricating material can match the structural strength and product compatibility of steel. Each Highland underground tank is provided with a limited 30-year warranty, but more important than the warranty is the company which stands behind it. Highland Tank employs a highly skilled workforce, the latest technology and stringent quality control procedures throughout its manufacturing process.

Highland products are subject to frequent unannounced quality assurance inspections by the Steel Tank Institute and Underwriters Laboratories' inspectors in addition to our own rigorous quality control program.

Standard Tank Features

- Individually engineered for 60" of overburden with the water table at grade level.
- Added "ribbed" strength from minimum 1/2" overlap welded joints at every shell and head.
- Continuous exterior full-fillet lap welds applied by the industry's best tank fabrication workforce, using state-of-the-art equipment and materials.
- Striker plates under every opening, protecting the internal tank surface.
- All tanks are UL-58 or UL-1746 listed.
- All tanks meet or exceed Federal EPA regulations.
- Shipped with easy-to-use installation instructions which permit use of a variety of backfill materials.



Single-wall

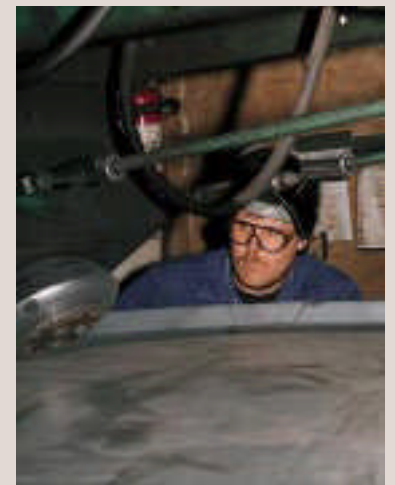
UL-58

One dependable wall made with ASTM compliant mild carbon steel up to 1/2" thick. The tank interior can be seal-welded or lined if preferred for storing liquids like jet fuel, avgas, potable water or chemicals.



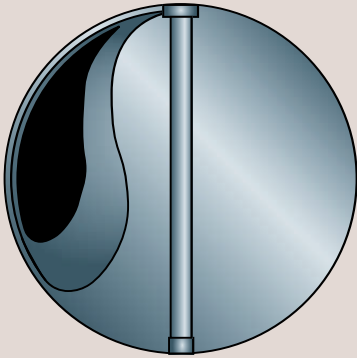
Rolling Steel

Steel plates from 10 ga. to 1/8" are rolled to form the rigid shell of the tank.



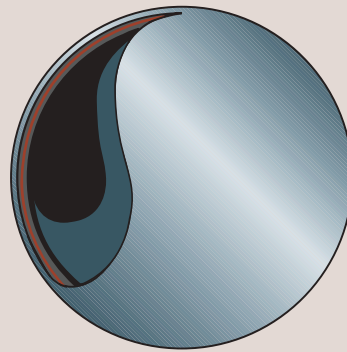
Forming Heads

Sheet steel is cut with a rotary shear and flanged to form tank head.



**Double-wall
UL-58**

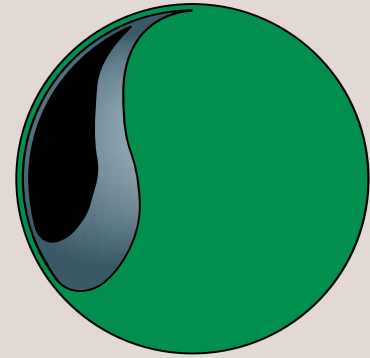
Two dependable walls of steel, the outer wrapped tightly around the inner creating an interstice. The interstice can be monitored to detect a leak in either tank wall using a Highland Tank monitoring system or manual probe. The primary tank can be internally seal-welded, lined, or constructed with stainless steel.



**Double-wall
UL-58 with Stand-Off**

Heavy duty construction using structural standoffs to define the interstitial space to assure quick fluid migration and greater structural integrity. The interstice can be easily monitored with a Highland Tank monitoring system or manual probe.

*Note: Double-wall constructions are also available with **New York City** 30 psi hydrostatically tested, dished head design.*



**Double-wall
Thermoplastic Jacket**

The inner tank is constructed like a single-wall steel tank, but the outer tank is made from thermoplastic creating an economical double-wall tank. The interstice design assures fluid migration. Seal-welded and lined interiors are available.

Note: All Highland Double-wall tank interstices assure fluid migration at a rate not less than one centimeter per second — vastly superior to the allowable rate. All double-wall tanks are shipped with a vacuum on the interstice.



Fitting Components
Manways, flanged and threaded fittings, coffer dams, and other special components are fitted to the tank, then welded in place.



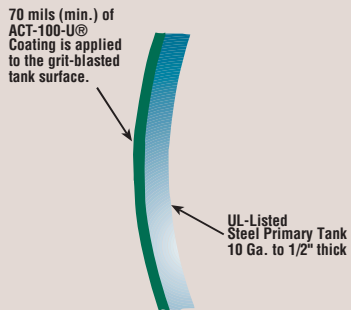
Welding
All tanks are sealed with a continuous exterior full-fillet lap weld. Interior welding is available with interior coatings.



Testing
All tanks are air tested for leaks at 5 psi. All seams are inspected to ensure weld integrity.

ACT-100-U®

The ACT-100-U® is the latest in steel tank technology. Highland combines the structural strength of steel with the assured corrosion protection of an advanced unique high-tech polymer coating.



The tank that performs as great as it looks!

The ACT-100-U® tank is as rugged as they come. In performance tests, the ACT-100-U® coating is superior to Fiberglass Reinforced Polyester (FRP) cladding. The ACT-100-U® 70 mil coating is much more resistant to incidental damage. It achieved three times the adhesion of FRP and, unlike FRP, did not take on water or lose its adherence over time.

Abrasion and impact resistance were also superior with this state-of-the-art polymer. The high impact resistance of the ACT-100-U® coating means that it is less likely to suffer damage during transport or installation. This means fewer problems for

installers and contractors both short and long term. ACT-100-U® tanks do not require cathodic protection with sacrificial anodes so they do not require monitoring!

The ACT-100-U® tank is environmentally friendly. The special resin used in the ACT-100-U® coating does not adversely impact the environment. Using the ACT-100-U® tank fits in with your and your customer's program of using non-hazardous materials. The ACT-100-U® coating is rated by the United States Department of Transportation as "non hazardous" in its liquid state and "inert" in its cured state.

Features

- Superior Highland Steel Construction
- Newest UST Standard from the Steel Tank Institute
- Environmentally Friendly
- High Cross-Link Density Coating
- Requires No Artificial Reinforcement
- Superior Coating Adhesion
- Superior Dielectric Quality
- Superior Impact Resistance
- Reduced Installation Costs
- UL-58 and UL-1746 Approved
- 30-year Limited Warranty
- EPA Approved

- Available in:
 - Single-wall
 - Double-wall
 - Double-wall with Stand-Off
 - New York City design
 - Single or Multi-Compartment

ACT-100-U® Coating

The ACT-100-U® resin is a unique polymer coating that is self-reinforcing, with high cross-link density and requires no artificial reinforcement. Just 70 mils of the ACT-100-U® coating out-performs 100 mils of FRP in every respect - including impact resistance, adhesion, exposure to heat and cold, abrasion resistance and most importantly, overall corrosion protection.

The ACT-100-U® tank meets or exceeds all current Underwriters Laboratories' (UL) underground protected steel storage tank standards. The HT-ACT-100-U® not only received the approval of UL, but the Steel Tank Institute (STI) approved it as well assigning the ACT-100-U® its own special label.



HT-TITAN™

The most technologically advanced underground storage tank available!

HT-TITAN™ redefines “state-of-the-art” secondary containment for underground storage tanks. The technology involves bonding a high molecular weight (HMW) polymer outer tank to a steel inner tank at every tank opening using high heat and pressure. The result is an extremely tough outer thermoplastic tank. HT-TITAN™ Tanks are vacuum sealed to ensure tank integrity during shipping, handling, and installation!

HT-TITAN™’s innovative enhancements offer secondary containment, excellent damage resistance along with reduced installation costs.



Secondary Containment

Space-age thermoplastic HMW polymer is extruded at the factory to secondarily contain an inner steel tank. The patented fusion bonding method at all openings assures inner and outer tank integrity. No flanges, exposed metal, gaskets, or fasteners are used. The extrusion equipment is the most advanced application method in the industry!

Excellent Damage Resistance

The primary tank is made of steel. Striker plates are provided under every opening. Each HT-TITAN™ Tank is engineered for a minimum of sixty inches of overburden. The tough outer tank is made from substantially rigid HMW Polymer that surpasses the performance standards of Underwriters Laboratories' UL-1746.



Features

- Superior Highland Steel Tank Strength
- Newest UST Double-wall Technology
- Environmentally Friendly
- Latest, Most Sophisticated Fusion Bonding Method
- Complete In-Factory Construction
- Virtually Damage Proof Outer Tank
- Factory Installed Vacuum Monitoring
- Reduced Installation Costs
- UL-58 and UL-1746 Approved
- 30 Year Limited Warranty

- Available in:
 - Single or Multi-Compartment

Vacuum Monitoring

HT-TITAN™ tanks use a vacuum monitoring gauge sealed at the factory. Checking the gauge at any time during transport or installation can determine if there is a breach in the inner or outer wall. The unique patented HT-TITAN™ design ensures fluid migration between the inner and outer tanks for reliable monitoring of 100% of the interstice!

Reduced Installation Costs

Highland Tank's vacuum monitoring gauge eliminates job site and installation precision testing costs. Flat head construction requires smaller concrete pads and less excavating and backfill. All Highland tanks can be installed with a wide variety of economical backfills — further reducing installation costs.

HT-STI-P3®

The HT-STI-P3® is the oldest, most successful underground tank technology ever developed.

Features

- Superior Highland Steel Construction
- Improved Design
- Environmentally Friendly
- 30 Year Limited Warranty
- Cathodically Protected

- Available in:
 - Single-wall
 - Double-wall
 - Double-wall with Stand-Off
 - Single or Multi Compartment
 - New York City design



The STI-P3® tank standard was issued in 1969 after several years of testing and development by members of the Steel Tank Institute. This cathodic protection system has made the STI-P3® the all-time, single best performing tank ever marketed. "P3" stands for protection, three ways: dielectric coating, electrical isolation, and sacrificial anodes. Combined, these three provide the most effective cathodic protection.

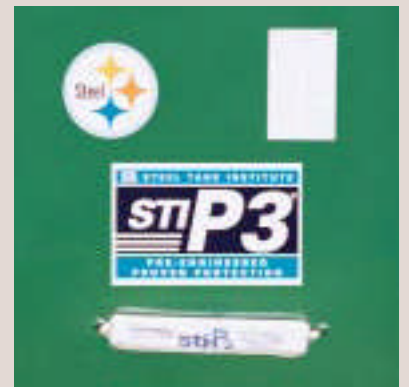
Highland Tank's new and improved HT-STI-P3® tanks use a tough, chemically resistant, yet environmentally friendly 100% solids polyurethane coating and have additional anodes for better monitor readings. The HT-STI-P3® is available with a long-life buried reference cell and continuous monitoring system.



Polyurethane coating



Di-electric Bushings



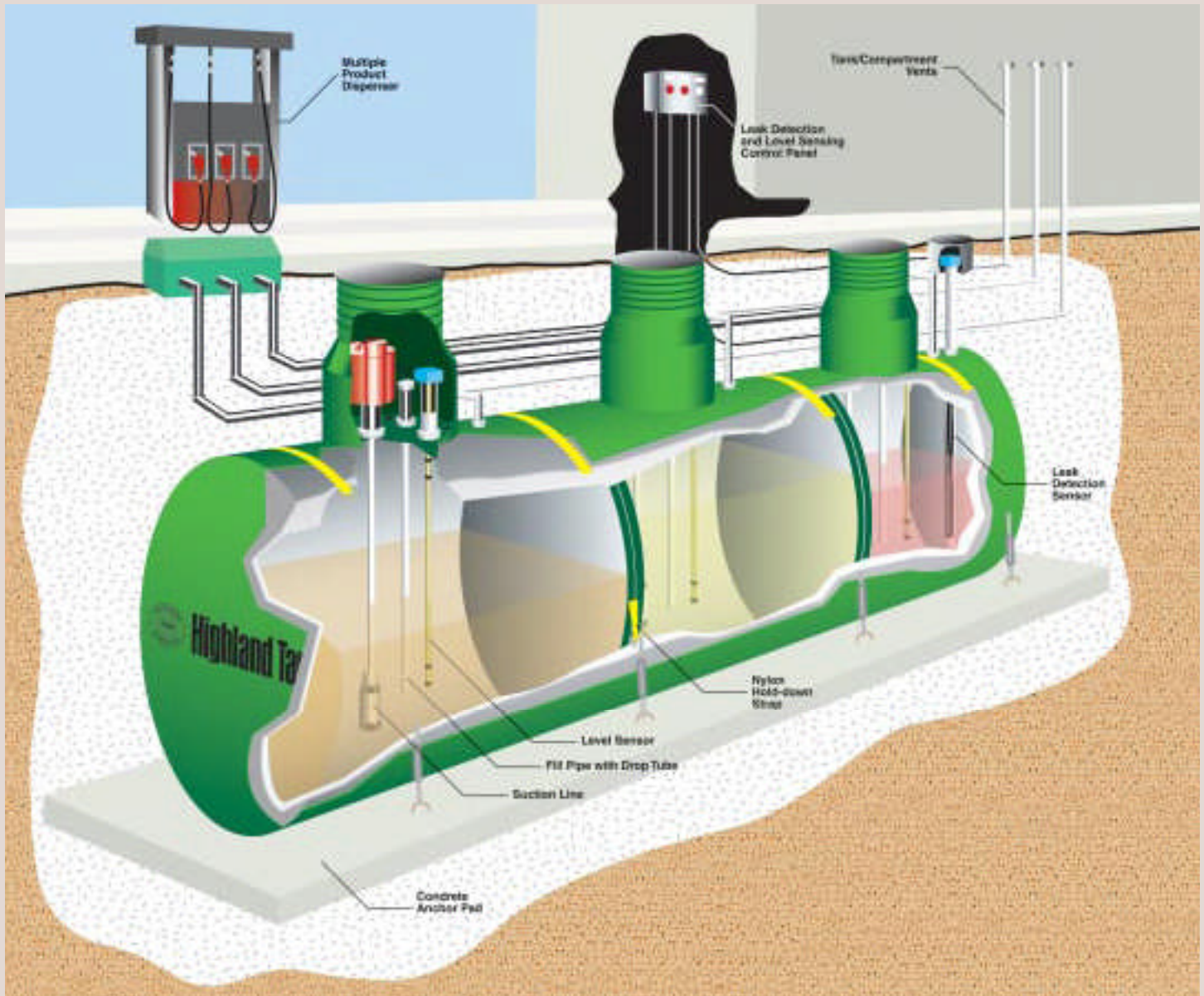
Sacrificial Anodes

Highland Compartmented Tank Option

The safe, economical alternative for storing multiple products in a single underground tank - from the nation's leader in steel storage tank innovation - Highland Tank.

Available in single and double bulkhead designs, tanks can be compartmented for storing multiple grades of gasoline and/or other liquid products. When Compartment tanks are requested with interior linings,

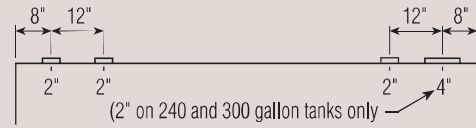
OSHA requires a minimum 36" clearance between the compartment bulkheads and a minimum 24" access manway in each compartment.



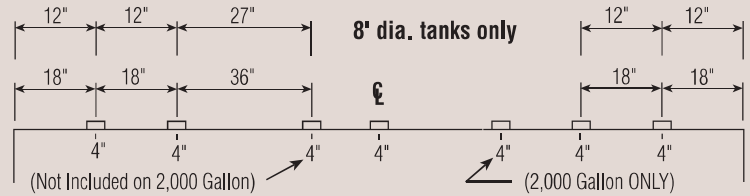
S C H E D U L E S

Typical Fitting Locations

For 240-1,500 gallon tanks



For 4,000-5,000 gallon tanks



For 1,501 - 50,000 gallon tanks

Capacity (Gallons)	Dimensions*		Approximate Weight (lbs.)				
	Diameter	Length	ACT-100-U® Single-wall	ACT-100-U® Double-wall	HT-TITAN	STI-P3® Single-wall	STI-P3® Double-wall
240 - 10 ga.	3'2"	4'0"	350	695	—	350	690
300 - 10 ga.	3'2"	5'0"	415	820	—	430	780
300 - 7 ga.	3'2"	5'0"	545	950	—	560	870
500 - 10 ga.	4'0"	5'0"	590	1,165	716	590	1,055
500 - 7 ga.	4'0"	5'0"	775	1,350	911	770	1,235
1,000 - 10 ga.	4'0"	10'9"	1,015	2,000	1,231	1,070	2,020
1,000 - 7 ga.	4'0"	10'9"	1,330	2,325	1,567	1,405	2,305
1,000 - 7 ga.	5'4"	6'0"	1,205	2,100	1,417	1,230	2,535
1,500	5'4"	9'0"	1,620	2,830	1,909	1,610	2,780
2,000	5'4"	12'0"	2,040	3,560	2,401	1,990	3,455
2,500	5'4"	15'0"	2,455	4,285	2,892	2,375	4,120
3,000	5'4"	18'0"	2,875	5,015	3,384	2,775	4,780
4,000	5'4"	24'0"	3,705	6,470	4,368	3,515	6,115
4,000	6'0"	19'0"	3,445	6,125	5,310	4,730	6,940
4,000	8'0"	10'8"	4,105	6,610	4,661	4,200	6,655
5,000	6'0"	23'10"	4,200	7,445	6,477	5,535	8,630
5,000	8'0"	13'4"	4,850	7,775	5,573	4,895	7,765
6,000	6'0"	28'8"	4,955	8,765	7,647	6,720	9,995
6,000	8'0"	16'0"	5,595	8,940	6,433	5,595	8,820
8,000	8'0"	21'4"	7,085	11,270	8,150	6,985	10,960
8,000	10'0"	14'0"	6,645	12,025	7,635	6,715	11,250
10,000	8'0"	26'8"	8,580	13,600	9,871	8,395	13,110
10,000	10'0"	17'0"	7,695	13,850	8,843	7,835	13,895
12,000	8'0"	32'0"	10,075	15,930	11,588	9,825	15,225
12,000	10'0"	20'6"	8,920	15,985	10,253	9,060	15,840
15,000	8'0"	40'0"	15,270	22,445	17,327	14,875	21,440
15,000	10'0"	25'6"	13,230	21,190	15,004	13,465	20,930
20,000	10'0"	34'0"	16,920	27,550	19,192	17,110	26,840
20,000	10'6"	31'0"	16,520	26,945	—	16,550	26,485
25,000	10'6"	38'9"	23,925	36,565	—	23,885	33,740
30,000	10'6"	46'6"	28,140	42,915	31,625	27,925	41,695
40,000	12'0"	47'6"	33,250	50,770	—	33,995	50,730
50,000	12'0"	59'6"	40,705	62,010	—	41,065	59,805

Note: All dimensions are subject to tolerances allowed by UL. *When calculating outside dimensions, please refer to the following:

Single-wall Steel

- ACT-100-U® per above
- HT-TITAN per above
- STI-P3®, add 16" to length

Double-wall

- ACT-100-U®, add 2" to length
- HT-TITAN, add 4" to length
- STI-P3®, add 16" to length

Double-wall with Stand-Off

- ACT-100-U®, add 7" to length and 3" to diameter
- STI-P3®, add 23" to length and 3" to diameter

Many other construction options are available including:

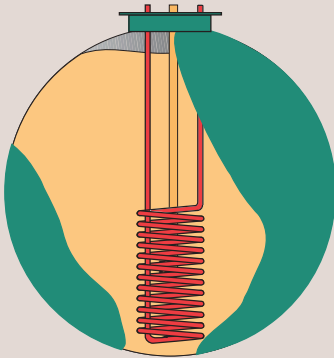
- Bulkheads
- Internal Seal Welding
- Butt Weld
- Stainless Steel Inner Tank
- Dimensional Adjustments
- Increased Burial Depth
- Internal Linings



Hold Down Straps



Manways, Extensions & Sumps



Steam or Hot-water Pre-heaters



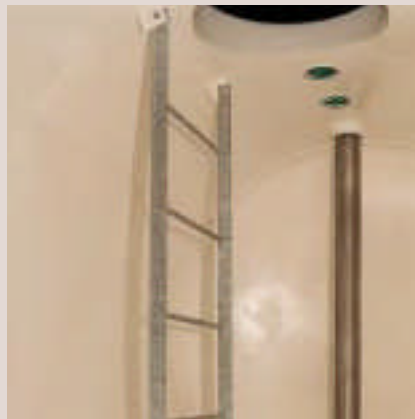
Extra Threaded Fittings



Threaded or Raised-face Flanges



Leak Detection & Level Sensing Equipment



Internal Ladders and Internal Linings



Compartmented Tanks



Selecting & Specifying

To receive a quotation, or to order a tank, complete the following:

Identify the product to be stored: _____ at what temperature: _____ °F or Ambient.

Select capacity based on delivery volume and rate of use: _____ gallons.

Specify diameter (and corresponding length-see chart of standard sizes): _____ feet, _____ in.

Do you want a compartmented tank? Yes • No

If so, specify compartment number and size; use a “/” for single bulkhead and “//” for a double:

Specify intended burial depth (from grade to top of tank when buried); _____ feet, _____ inches. (60" is standard).

Specify Tank Model: ACT-100-U®, HT-TITAN™ or HT-STI-P3®.

For ACT-100-U® or HT-STI-P3®, specify construction:

- Single-wall
- Double-wall
- Double-wall with Stand-Offs

For HT-STI-P3®, specify if you want optional buried reference cell (PP4)? Yes • No

For HT-STI-P3®, specify if you want optional continuous CP monitoring system? Yes • No

Specify if you want/need an internal lining:

(An internal lining requires at least one manway in the tank.)

Do you want/need manways? Yes • No

Specify lid design for manway.

- A – One opening
- B – Two openings
- C – Three openings
- D – Four openings

If yes, specify number, size, and bolt pattern:

___ 24" Single Ring ___ 24" Double Ring

___ 30" Single Ring ___ 36" Single Ring

Specify design: _____

Do you want any internal ladder(s)? Yes • No

If yes, how many: _____

Do you want/need manway extensions? Yes • No

If yes, specify number, size, and depth: _____

Do you want/need piping containment/manway access thermoplastic sumps? Yes • No

If yes, specify number and size: _____

Will a steam/hot water pre-heater be required? Yes • No

Determine size and number of threaded connections; ___2" ___4" ___6" ___8" ___10"

Determine size and number of bolted flanges: ___2" ___4" ___6" ___8" ___10"

Specify type of hold down straps:
• Standard • Safety • Dead-Man • Nylon

Do you want level sensing equipment? Yes • No

If yes, specify levels of notification: 5% • 10% • 25% • 50% • 75% • 90% • 95% • 98%

Do you want double wall interstitial monitoring equipment? Yes • No

Do you want a remote alarm? Yes • No

If yes, specify for which of the above: _____

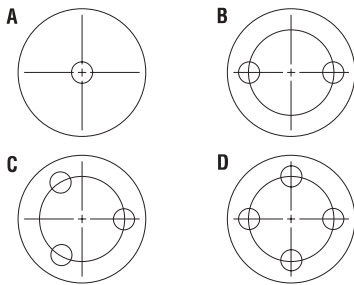
Do you want electronic tank gauging equipment? Yes • No



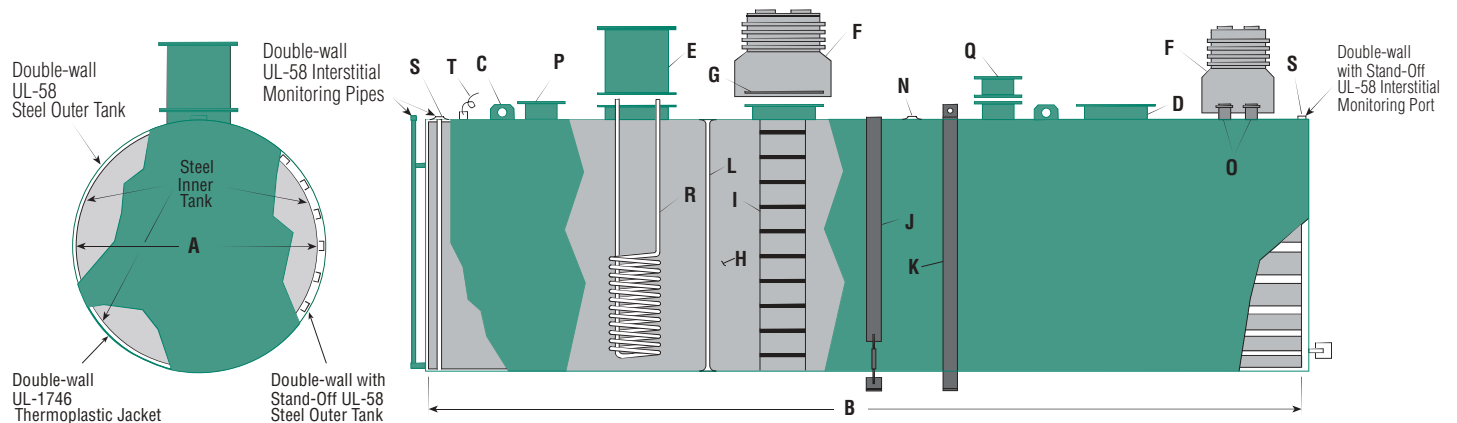
A simple sketch, showing size, location of fittings and accessories required, is helpful when ordering. For quick and easy reference when specifying and ordering, please refer to the adjacent diagrams of standard features and some of the accessories available.

Manhole Lid Designs

Up to (4) - 4" fittings.
Standard 8" centerline radius.



- A.** Tank Diameter - Ranging from 38" to 12
- B.** Tank Length - Ranging from 4' to 59' 6"
- C.** Lifting Lugs - Standard on all tanks
- D.** Manway - Diameters from 24" to 36", single or double bolt ring
- E.** Manway Extensions - Customized per installation
- F.** HDPE Tank Sumps
- G.** Sump Manway Mount Kit
- H.** Interior Surface Preparation - Specify interior coating and sandblast if required
- I.** Interior Ladder - 2" x 1/4" sides - 3/4" rungs on 12" centers
- J.** Hold Down Straps - Refer to straps & pads specification sheet
- K.** Safety Hold Down Strap - Refer to straps & pads specification sheet
- L.** Compartment Bulkheads - Single or double
- M.** Sacrificial Anodes - Standard on sti-P3® tanks
- N.** Standard Threaded Fittings - Specify size, number, location
- O.** Close-Off Fittings - Used to mount HDPE Sumps
- P.** Flanged Fittings - 150 # A.S.A. with isolated, threaded companion flange - Specify size, number, location
- Q.** Flanged Fitting with Isolation Spool - Specify size, number, location
- R.** Fuel Oil Preheater
- S.** Leak Detection System - Specify Liquid Only or Discriminating Liquid/Hydrocarbon.
- T.** Lug & Wiring for Protection Prover - PP2 Test Station for HT-STI-P3® tanks





Highland Tank

Highland Manufacturing Locations

One Highland Road
Stoystown, PA 15563-0338
814-893-5701
Fax 893-6126

99 West Elizabethtown Road
Manheim, PA 17545-9410
717-664-0600
Fax 664-0617

958 19th Street
Watervliet, NY 12189-1752
518-273-0801
Fax 273-1365

2225 Chestnut Street
Lebanon, PA 17042-2504
717-664-06025initialized
Fax 664-0631

2700 Patterson Street
Greensboro, NC 27407-2317
336-218-0801
Fax 218-1292

Lowe Engineering
1510 Stoystown Road
Friedens, PA 15541-7402
814-443-6800
FAX 444-8662

Please visit us at www.highlandtank.com