ASME PRESSURE VESSELS & WATER STORAGE TANKS



Fire Protection Potable Water Rain/Greywater Harvesting Thermal Energy Storage ASME Pressure Vessels





Proudly made in America

Unmatched Quality & Service

Our mission

Highland Tank's mission is to engineer and manufacture quality products while providing innovative solutions through relationships founded upon integrity and excellence in customer service.



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Manufacturing Expertise

Experience

A tradition of uncompromising craftsmanship and an unparalleled commitment to provide solutions to even the most challenging storage tank projects has made Highland Tank the leader in the steel tank industry. Engineering depth, state-of-the-art equipment and skilled craftsmen have provided the tools needed to maintain this dedication to quality production.

Capability, Capacity, Commitment

Highland Tank has facilities strategically located to serve our core markets in the United States. Our team works with the proper tools and latest technology to help build the customized products required in today's world. Steps are constantly being made to keep Highland Tank on the cutting edge. Even in economic times when many companies are cutting back and downsizing, Highland Tank is committed to our clients. We have even added a brand new facility, which will allow us to build larger, heavier tanks and vessels that are in demand. This new facility is just one more reason why Highland Tank remains the leader in steel tank manufacturing.

Quality Assurance

All of our products are backed by our helpful support staff to ensure quality throughout every phase of your project. Highland's team of professionals in design, engineering, fabrication, sales, delivery and service provide you with outstanding solutions for your liquid storage challenges. Our goods undergo strict quality control processes and are readily available from our national distribution network and six manufacturing facilities.

Manufacturing area:

296,000 ft² at six locations

Maximum Physical Fabrication Size:

Horizontal tanks: 70,000 gallons Vertical tanks: 57,500 gallons ASME pressure vessels: 60,000 gallons Maximum diameter: 14' Maximum length: 90' Steel rolling: up to 1-1/4" thick

Product Transportation:

Highland Tank takes product delivery seriously. We have our own fleet of trucks and team of experienced drivers. Your product will be in the hands of people who transport oversized loads every day, taking pride in timely delivery and providing Highland's signature service.





Steel: The Material of Choice

Superior Structural Strength

The Steel Advantage

Steel is the material of choice at Highland Tank because of its many advantages, and it should be yours too. As a construction material, steel is strong, affordable, reliable and environmentally friendly. Steel's unique combination of properties and characteristics enable it to achieve performance levels required in today's storage tanks.

Specified for Strength

We buy steel according to our own strict guidelines and meeting rigid ASTM specifications. Our mild carbon steel is fine grain with superior toughness and surface quality that offers both weldability and improved corrosion resistance. The time-tested strength and performance of steel remains unparalleled.

Steel's structural integrity can withstand extreme weather conditions or natural disasters. State-of-the-art fabrication technology, welding, linings and coatings reinforce the durability of Highland's mild carbon and stainless steel products.

Environmental Benefits

Steel is 100% recyclable and has the highest recycling rate of any durable material in the United States. Unlike concrete or plastic storage tanks, even those reinforced with fiberglass, recycled steel storage tanks ultimately keep a valuable commodity out of the nation's landfills. In addition, the latest recycling processes drastically reduce industrial emissions by over 70% to air and water, accompanied by a reduction of approximately 30% in the amount of energy required to produce new steel. Highland Tank products will form an integral part of your "green" building.



Stainless Steel Construction

Highland Tank has a long and successful record of manufacturing stainless steel storage tanks for our commercial and industrial customers. Our tanks are manufactured from 304, 304L, 316 or 316L stainless steel for compatibility with many corrosive environments.

Contemporary steel-making techniques enable stainless steel to be welded and fabricated as readily as conventional steels. Additionally, stainless steel has many unique properties that may make it the best choice for your special storage requirements.

Advantages

The bright, easily maintained surface of stainless steel provides a clean, contemporary appearance. Stainless steel is corrosion-resistant to a large number of liquids and recommended when carbon steel or internal linings are not compatible with the wastewater being processed.

Customized for Your Needs

Because every application is unique, Highland Tanks' stainless steel tanks are "made-to-order." When specifying or ordering custom stainless steel tanks from Highland Tank, our experienced staff will assist you in selecting just the right grade and combinations of features to meet your specific needs.



Highland Tank Sets the Standard

We offer innovative steel fabrication combined with a variety of specialty coatings designed to meet your specific needs. Our water storage tanks and ASME pressure vessels are built to one or more of the standards below.

ASME Pressure Vessels

- American Society of Mechanical Engineers ASME Code (National Board Registration), Section VIII, Division I; Section IX (Welding)
- American Welding Society AWS
- American Society for Testing and Materials - ASTM
- American Society of Heating, Refrigeration and Air Conditioning Engineers - ASHRAE
- National Sanitation Foundation NSF

Atmospheric Water Storage Tanks:

- Underwriters' Laboratories, Inc. UL-58, UL-142, UL-1746
- American Petroleum Institute API-650
- National Fire Protection Association NFPA 22
- American Water Works Association AWWA D100
- Occupational and Safety Health Administration - OSHA
- National Sanitation Foundation (NSF)

Highland Tank and Steel Tank Institute specifications are followed to assure complete internal and external corrosion protection. We can supply a full range of equipment packages and we excel in custom fabrication for those unique situations.









Saving Our Environment for Future Generations

Water scarcity is a mounting national and worldwide problem. In many regions, water demand has exceeded the reliable supply of surface and renewable groundwater for years. Efforts to conserve water and make better use of rainwater and effluent wastewater have increased dramatically in recent years.

The new emphasis on controlling water usage has influenced the building and design industries to develop innovative methods of water conservation. The U.S. Green Building Council has established the Leadership in Energy and Environmental Design (LEED) rating system to help promote buildings that are environmentally responsible.

The LEED Green Building Rating System was created to improve environmental and economic performance of new and existing commercial, institutional and residential buildings. LEED provides a verifiable means to demonstrating that a building is "green." Points are awarded for Sustainable Sites, Water Efficiency, Energy Efficiency, Materials and Resources, Indoor Environmental Quality and other categories. Highland Tank's steel HighDRO[®] Water Storage Tanks and ASME Pressure Vessels can be fully incorporated into a new or existing building's design to qualify for valuable LEED credits for Water or Energy Efficiency. Highland Tank will even provide turnkey rainwater harvesting or greywater recycling systems.

Steel water tanks or pressure vessels can also score additional credit for Materials and Resources. Highland Tank can manufacture products from recycled steel, and they can be recycled again at the end of their useful lives.

Designers, engineers and builders have long recognized Highland Tank's steel tanks and vessels for their strength, durability and functionality. And in today's world, consumers and purchasing agents are recognizing steel's important environmental attributes - especially its high recycled content and reclamation rate.

For decades, Highland Tank has been instrumental in creating and implementing designs to process, store and conserve water. These products save money and preserve valuable resources for generations to come.

Atmospheric Tank Construction

Forming Steel

The fabrication process begins with the rolling of steel that meets ASTM specifications. Steel plates from 10 gauge to 1-1/4 inch thick are rolled to form the rigid shell of the tank. Lap joints provide superior "ribbed" strength.

Single-Wall Construction

Steel plates are formed, fitted and welded, creating a strong storage tank. Impervious bulkheads may be added to create multiple compartments. Flat-flanged heads are standard, as are continuous exterior welds on all joints. Flanged and dished heads are available upon request.

Double-Wall Construction

Double-wall water or wastewater storage tanks are constructed by wrapping a secondary steel wall completely around the primary tank. The space between the two walls, known as the interstice, can be made up to 3" wide for injection of special time-activated, expandable foam that effectively insulates the storage tank.









Fittings, Piping and Manways

Fittings and flanges enable connection to external piping systems. Water and wastewater storage tanks can be fitted with standard or customized internal piping including internal elbows, vortex breakers, sumps or bottom drains. Cylindrical or large rectangular manways of 24" diameter or larger, allow for safe, convenient access for inspection and maintenance from above.

Factory Testing

A 5 psi factory air test and seam inspection is conducted on every storage tank. Double-wall storage tanks are shipped with a vacuum on the interstice for continuous testing to guarantee integrity of both the primary and secondary tanks.







ASME Pressure Vessel Construction

Built to ASME Code, Section VIII, Division I

Forming Steel

The fabrication process begins with the rolling of steel that meets ASTM specifications. Steel plates from 1/4" to 1-1/4" are rolled to form the rigid shell. Throughout the manufacturing process testing and documentation procedures ensure compliance with ASME standards.

ASME Code Heads

Highland Tank's typical ASME vessels incorporate ASME 2:1 semi-elliptical heads as standard design.

Welding

Certified welders must be qualified to strict welding procedures in accordance with ASME Code, Section IX. Their procedures are continually monitored and certifications maintained.







Fittings, Flanges and Manways

Fittings and flanges enable connections to external piping systems and appurtenances. All carbon steel ANSI flanges are rated based on their class and temperature. Full-fillet welds are used to attach fittings, flanges and nozzles to vessel shells and heads. Vessels 36" in diameter and larger are provided with an elliptical manway for internal access and inspection.

ASME Testing and Inspection

Various conventional and advanced nondestructive examination methods are used for the inspection of pressure vessels by certified inspectors. Visual or surface examination detects any discontinuities and defects that are at the surface. Radiographic or Ultrasonic examination can detect defects that are located within the weld or the steel.

ASME pressure vessels are tested per requirements of Section VIII of the ASME Code. Once manufacturing and testing are completed, a manufacturing certificate detailing pertinent information regarding the vessel is registered with the National Board.







Advanced Corrosion Protection

Performance Coatings

Quality assurance is maintained through Highland's complete in-house grit blast cleaning, finishing and curing facilities. A wide variety of VOC compliant coating systems are available, including standard and special surface preparation, application methods and multi-coat systems.

Whether it is exterior or interior, Highland Tank has the expertise to ensure a long-lasting protective coating.

Proper surface preparation is the most important factor in any successful coating or lining. Highland Tank uses a steel grit blast, which creates a rough profile on the surface and aids coating adhesion. Our experienced personnel then apply our wide range of sprayapplied, high-performance formulations.

Exterior Coatings

The exterior of a storage tank or vessel can be coated with an oxide or zinc primer. Options like high-solids epoxy and polyurethane finish paint provide enhanced corrosion protection and abrasive resistance.

HighGuard is Highland Tank's innovation for protection of underground water storage tanks or vessels. This coating system demonstrates an excellent balance of flexibility, impact strength, abrasion resistance and corrosion resistance. This plural-component polyurethane has been approved by Underwriters' Laboratories, Inc. under UL-1746, Part IV.

Internal Linings

Internal linings for potable and nonpotable water storage tanks and vessels usually are National Sanitation Foundation International (NSF) certified. Volitile Organic Compound (VOC) compliant, spray-applied epoxy and polyurethane linings, cement linings and assorted sheet linings are available for various applications.

Highland Tank's high-quality coatings and linings are applied and cured at the factory under strict, environmentally controlled conditions to ensure the most consistent application and performance.









HighDRO Water Tanks

Tough, Reliable Tanks for Water Storage

HighDRO[®] Tanks were developed by Highland Tank with the aim of satisfying the ever-increasing need for safe and sanitary storage of water. HighDRO[®] Tanks are atmospheric storage tanks designed specifically for storage of potable water, fire protection water, wastewater and rainwater.

These prefabricated tanks range in volume from 300 to 70,000 gallons and are manufactured for a wide range of municipal, commercial, institutional and industrial applications.

Applications

- Institutional Facilities
- Schools
- Hospitals
- Prisons
- Hotels
- Resorts
- Casinos
- Apartment Complexes
- Rural Housing Developments
- Campgrounds
- Farms

Advantages

HighDRO[®] welded steel tanks can satisfy most water and wastewater storage applications. Whether constructed of coated carbon steel or stainless steel, rugged and reliable HighDRO[®] Tanks are inherently resistant to almost all environmental threats as well as corrosion. Unlike concrete or plastic storage tanks, even those reinforced with fiberglass, HighDRO[®] Tanks are 100% recyclable.

HighDRO[®] water tanks can be installed aboveground or underground. Due to their shop-fabricated design, HighDRO[®] Tanks offer a great number of advantages over field-fabricated tanks.

Features

- Safe hygienic water storage
- Unaffected by ultra violet or light penetration
- Rugged and simple designs
- Transportable to remote locations
- Reduced project lead time from inception to completion

Compliance

HighDRO[®] Tanks are manufactured to stringent standards. HighDRO[®] Tanks used for storage of clean water are typically of single-wall construction complying with recognized water tank codes such as:

- American Water Works Association AWWA D100 - "Standard for Welded Steel"
- National Fire Protection Association NFPA Standard No. 22, "Water Tanks for Private Fire Protection"
- National Sanitation Foundation (NSF)

Additionally, HighDRO[®] Tanks used for storage of wastewater, which may contain flammable or combustible liquids, are typically double-wall construction in accordance with Underwriters' Laboratories Inc. Standards UL-58, UL-1746 and UL-142.

HighDRO[®] Fire Protection Tanks



HighDRO[®] Fire Protection Tanks (HD-FPT) are atmospheric water storage tanks specifically designed for use in a residential, commercial or institutional building's fire protection system. A properly sized HD-FPT will make a valuable contribution during firefighting emergencies, especially when firefighting demands more water than the building's domestic water feed line can supply.

All components comply with the relevant standards to ensure that the system will provide years of reliable service. Specifically, they are designed, fabricated, tested, inspected and installed in accordance with the National Fire Protection Association NFPA Standard No. 22, "Water Tanks for Private Fire Protection."

Pre-engineered components such as Victaulic[®] fittings, external water stops, tank sumps, pump station mounts and anti-vortex devices are usually supplied with the tank. NSF, AWWA or UL compliant protective coatings are factory applied and form a hard, inert barrier for both the interior and exterior surfaces of the tank to prevent corrosion. HD-FPT are often required by local fire codes to provide a dedicated source of firefighting water for rural, suburban and urban communities.

Water distribution system requirements from local municipalities can be unattainable or prohibitive due to extensive development. In this case, water must be stored and available in sufficient quantity to satisfy the fire sprinkler pump demand. It is more common for HD-FPT to be required by fire codes as secondary water supply for use with a building's sprinkler systems for fire suppression.

HighDRO[®] Potable Water Tanks



HighDRO[®] Potable Water Tanks (HD-PWT) are an effective and economical way to store potable water for residential, commercial, institutional and industrial installations. These factory-welded and coated carbon steel water tanks are pressure tested for tightness to ensure the quality and dependability of the water supply.

The high strength, impermeable steel shell combines with our HighDRO[®]-Liner Plus polymer composite water storage liner to provide a flexible, long lasting tank system. We manufacture HD-PWT for all types of domestic water supplies, such as well water, city-supplied water or delivered water for:

- Schools
- Hospitals
- Prisons
 Resorts
- Rest Areas
 Campgrounds
- Rural Developments
- Livestock Feed Stations
- Emergency Water Supplies

HD-PWT are constructed to the highest standards to ensure a safe, contamination free environment. NSF, UL and AWWA compliant protective linings and coatings are factory applied and form a hard, inert barrier for both the interior and exterior surfaces of the tank to prevent corrosion. Our interior liner complies with NSF/ANSI 61 Drinking Water System Components - Health Effects for the safe storage of potable water - the nationally recognized standard for all devices, components and materials which contact drinking water.

To ensure maximum longevity and optimum use, our corrosion protection systems for underground water tanks comply with UL-1746. Aboveground tanks can be protected with a wide selection of primers and topcoats, even those complying with ANSI/AWWA D102-03, "Coating Steel Water-Storage Tanks."

HighDRO Rainwater Collection Tanks



HighDRO[®] Rainwater Collection Tanks (HD-RCT) are available for either aboveground or underground installations.

Whether of stainless steel or coated carbon steel construction, HD-RCT provide a renewable supply of water that can be used for a wide range of purposes.

Applications

- Lawn and landscape irrigation
- Fire water supply
- Laundry washing
- Toilet flushing
- Building power washing
- Industrial processing
- Pool filling
- · Vehicle washing

Rainwater "Harvesting"

In some areas, rainwater may represent the primary source of water. Collected rainwater can augment primary water sources and it is a good standby in times of emergency, such as during power outages, droughts or when the well goes dry.

Highland Tank will provide turnkey rainwater harvesting systems. These complete systems are a key element to earning valuable LEED credits in a "green" building.

HighDRO Stormwater Detention Tanks



In its simplest form, the concept of stormwater management is to provide a means of flow reduction and treatment prior to discharge from a developed site. Retention of peak flows under extreme rainfall conditions is imperative in maintaining and/or improving our surface water quality. Highland Tank Stormwater Detention Tanks (SDT) play a critical role in many stormwater management plans.

In some instances, stormwater requires vigorous onsite storage to avoid hydraulic overload of the sewer infrastructure. The intent is to reduce flooding and/or the potential for overflow at the wastewater treatment plant.

Protected steel tanks provide the proper stormwater storage to meet the treatment volume objective as well as providing additional capacity for channel and/or flood protection requirements. Once the treatment objective is met the water can be control pumped to the treatment plant under normal operating conditions.

Highland Tank SDT are constructed of carbon steel with choices of tough high-solids epoxies, polyurethane and other linings or external coatings. These "tight" tanks are available for aboveground and underground installation based on your needs. Contact your local Highland Tank representative to discuss which coatings best suit your project. Custom sizes and options are available including stainless steel fabrication.

Highland Tank will design and manufacture SDT to relevant AWWA, NFPA, UL or API Standards. A variety of manways and nozzle connections are available including flanged, threaded and Victaulic[®]. Our team of professionals will work closely with you to build a SDT to meet your specific needs.

HighDRO[®] Wastewater Storage Tanks

Designed to Exceed the Demanding Needs of the Wastewater Industry



HighDRO[®] Wastewater Storage Tanks (HD-WWST) are required for use in wastewater systems where individuals or companies are responsible for disposal of their own domestic, commercial, industrial, or agricultural liquid wastes. These "tight" tanks are available for either aboveground or underground installations and are designed to store a wide range of contaminated wastewater.

Applications

- Landfill Leachate
- Agriculture and Livestock Liquid Wastes
- Greywater
- Industrial Chemically Contaminated Wastewater
- Blackwater or Septage

HD-WWST are available in a wide range of sizes, capacities and arrangements. We offer carbon steel construction with the convenient choices of tough, high-solids epoxies, polyurethanes, rubber, PVC and other sheet linings, all dependent on the project and the liquid to be stored.

Stainless steel HD-WWST are also available. These tanks withstand the wider range of temperatures, chemicals and pH factors encountered in industrial applications. Highland Tank has extensive experience in the design, manufacture and installation of wastewater storage tank systems.

Built to Meet Your Needs

- Standard and custom sizes
- Manways and fittings to suit project requirements
- Variety of accessories available

Compliance with Application

- Relevant AWWA, NFPA, UL or API standards
- Applicable design configurations
- Corrosion consideration
- PH/acidic levels
- Operating temperature

HighDRO Thermal Energy Storage



Planning for a potential loss of cooling system capacity, although rare, is essential in maintaining the integrity of information storage at data centers around the world. Thermal Energy Storage (TES) is a key element in delaying the effects of cooling failure due to power loss or catastrophic failure. TES systems are engineered process tanks or vessels that add heat or remove heat from a storage medium such as water. TES is a low cost form of storage that can be either a pressurized ASME vessel or atmospheric UL-142 storage tank. The fundamental process of TES is a basic concept. Water is cooled by chillers during off-peak hours and stored in insulated tanks. This stored, cooled water is then used for space conditioning during times of high temperatures using pumps, control valves and fan energy.

The most common chilled water TES is a cylindrical, vertical pressurized water storage vessel. These rugged steel vessels are protected from corrosion with durable interior and exterior polyurethane coatings.

TES is proven to be an attractive option when new investments in chiller plants are required. The need for back-up or redundant systems in time of need at mission critical facilities makes a chilled water storage tank the most economical investment in cooling system design.

Environmental benefits include reduction of source energy use, decreased refrigerant charge and improved efficiency of the energy supply. Because Highland Tank's TES are made of durable goods like protected steel, non-corrosive PVC diffusers and minimal, if any, VOC coatings, life cycle costs are at a minimum. Warm return water enters tank at top and is distributed by diffuser pipe assembly



Cooled water is distributed through identical diffuser pipe assembly and returned to service

TES are most likely to be cost effective in situations where:

- A facility's cooling load is much greater than the average load
- Back-up cooling capacity is needed
- Load shifting is required or loads are cyclical
- Efficient operation is important.
- Capital costs are relative
- Interruption in cooling water cannot be tolerated by a mission critical operation



HighDRG-Pure Rainwater Harvesting Systems

HighDRO[®]-Pure Rainwater Harvesting Systems (HD-P-RHS) are designed to collect, store and reuse rainwater.

The HighDRO[®]-Pure system produces a sustainable and reliable alternative water source and helps reduce stormwater runoff and dependence on domestic water.

Highland Tank's HighDRO[®]-Pure system can be incorporated into a design to help earn valuable Water Efficiency LEED credits. Additionally, our Rainwater Collection Tanks (RCT) score points for Materials and Resources credits. Our new steel products are made from recycled steel and can be recycled again at the end of their useful lives.

Features

- Unlimited storage capabilities
- Efficient, streamlined treatment process
- Low energy consumption per gallon treated
- Influent flow rates to 6,000 Gal/Min
- Distribution flow rates from 5 to 300 Gal/Min

Rural, domestic, commercial and industrial consumers throughout the country are now choosing rainwater harvesting systems for economic reasons as well as environmental concerns.

Benefits

- Saves water consumption costs
- Reduces demands on municipal, surface or ground water supplies
- Protects the integrity of local waterways by reducing non-point source pollution
- Beneficial for cleaning purposes as less detergent is needed
- Good for irrigation as water is free of salts and man-made pollutants
- Reduces flooding and erosion

Highland's HighDRO[®]-Pure systems are the most complete rainwater recycling systems on the market. We will custom design and build a system to suit your project needs.



Pre-packaged, turnkey systems designed for your needs.

When rainwater is collected from a building's rooftop, the roof serves as the collection point. The Flush Filter (HD-FF) removes dirt, leaves and debris from the roof to ensure clean water. Gutters or downspouts still carry the water away, but instead of depositing water to the ground, the gutters carry the rainwater to the Rainwater Collection Tank (HD-RCT). Filtering, ultraviolet treatment, chlorination or other accepted sanitation of the rainwater by the Advanced Water Filtration System (HD-AWFS) produces the cleanest water possible for non-potable water use.

- 1. Rainwater Source
- 2. Flush Filter (HD-FF)
- 3. Flush Filter Overflow to Storm Drain
- 4. Floating Suction & Submersible Feed Pumps
- 5. Rainwater Collection Tank (HD-RCT)
- 6. Collection Tank Overflow to Storm Drain
- 7. Carbon Filtration
- 8. Multimedia Filter
- 9. Control System (HD-CS)
- 10. UV Filter
- 11. Day Tank (HD-DT)

- 12. Make-up Water Connection
- 13. Carbon Vent
- 14. Booster Pump (HD-BP)
- 15. Chlorine Injection
- 16. Dye Injection
- 17. Water Supply to Building
- 18. Filtration Skid (50-60 ft²)



HighDRG - Clear Greywater Recycling Systems



HighDRO[®]-Clear Greywater Recycling Systems (HD-C-GRS) are designed to store and treat greywater to a high quality for a wide range of non-potable water uses.

- Lawn and Landscape Irrigation
- Flushing Toilets
- Car Washing
- Fire Water Supply

They provide a fundamental solution to many ecological problems resulting from expanding populations and depleted water resources.

HD-C-GRSs are engineered for site-specific applications with various compact aboveground or underground designs that utilize either coated carbon or stainless steel storage and conveyance elements.

Greywater Recycling

Sources of greywater are:

- Washing Machines
- Bathtubs
- Showers
- Hand Sinks

These sources make up more than 35% of effluent discharged on a daily basis by schools, hospitals, prisons and other industrial/commercial buildings. With the introduction of the HighDRO[®]-Clear GRS, this greywater can be treated and reused.

Advantages

- Lower fresh/tap water use
- Reduce strain on septic systems and sewer treatment plants
- Lower water and sewer bills
- Less energy and chemical use
- Recharges depleted groundwater

Environmental Stewardship

The GRS engineered system design employs time-tested treatment techniques while incorporating state-of-the-art disinfection and transmission components. These systems provide users a reliable source of recycled water for irrigation and other secondary applications.



Earn Valuable LEED Points with a HighDRO®-Clear System

The HighDRO[®]-Clear GRS is a centralized treatment system designed to mimic processes found in nature. Biotreatment, adsorption, aeration, and disinfection are all utilized to provide a simple and environmentally friendly approach to greywater reuse. By incorporating this complete system from Highland Tank, you can earn credits toward your LEED Certification.









Greywater is defined as - untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes.

Selecting & Specifying HighDRO® Water Tanks

Capabilities at a Glance

Orientation:

Vertical or Horizontal

Installation: Aboveground or Underground

Volumes:

185 to 57,500 gallons; multiple HighDRO[®] Tanks may be interconnected to increase storage volume above 60,000 gallons

Diameter:

3'-2" to 14'-0"

Length: Up to 90'-0"

Maximum Weight:

80 Tons

Material:

- Carbon Steel
- Stainless Steel: ASTM/AISI Type 304, 304L, 316 and 316L

Finishes:

- No. 1 Hot rolled, annealed and passivated - 3/8" and thicker
- No. 2B Cold rolled, annealed, pickled & passivated with additional polished rollers pass

Head Design:

Flat are standard. Flanged and dished, or cone (vertical only) are also available.

Penetrations:

Threaded full couplings - up to 4" diameter

- Flanged fittings 1/2" and up
- Manways 24" minimum, 30", 36" diameter and custom rectangular manways

Surface Preparation:

SSPC SP-6, SP-10, SP-5

Internal Linings:

- Epoxy Phenolic
- High-solids Epoxy
- High-solids Polyurethane
- Zinc-Epoxy
- Vinyl Ester
- Rubber, PVC and other sheet linings

External Coatings:

- Primer Paint
- High-solids Epoxy/Polyurethane Finish Paint. Standard color -white. Custom colors available

External Corrosion Protection Systems:

HighGuard

Testing

5-psi factory air test and seam inspection

Tank Support Systems

- Horizontal UL Saddles
- Vertical Ring Bases & Angle Legs

Tank Accessories

- Interior ladders
- Waterstops
- Vents
- Exterior ladders w/ OSHA cages & guard-rails; stairs, walkways, catwalks
- All necessary appurtenances per AWWA D100 and NFPA 22
- Water/wastewater pumps and controls
- Gauges



www.highlandtank.com



Pre-Engineered Tank Design Options

Horizontal Design Options

Potable Water Tanks (HD-PWT)

fire.

waste products.

A water tank with a NSF certified liner designed to store water of a quality suitable for drinking.



HighDRO[®] Horizontal Tank Sizing Guide



Length 17'-0" 26'-8" 20'-6" 32'-0" 25'-6" 40'-0" 34'-0" 31'-0" 42'-6" 38'-9" 51'-2" 46'-6" 47'-6" 59'-6" 54'-6" 71'-0" 65'-5" 60'-6" 72'-0"

Volum	Volume	Dimen	sions	Volume	Dimensions		
	Gallons	Diameter	Length	Gallons	Diameter	Le	
	185	3'-2"	3'-4"	10,000	10'-0"	17	
	240	3'-2"	4'-0"	10,000	8'-0"	26	
	300	3'-2"	5'-0"	12,000	10'-0"	20	
	500	4'-0"	5'-5"	12,000	8'-0"	32	
	1,000	4'-0"	10'-9"	15,000	10'-0"	25	
	1,000	5'-4"	6'-0"	15,000	8'-0"	40	
	1,500	5'-4"	9'-0"	20,000	10'-0"	34	
	2,000	5'-4"	12'-0"	20,000	10'-6"	31	
	2,500	5'-4"	15'-0"	25,000	10'-0"	42	
	3,000	5'-4"	18'-0"	25,000	10'-6"	38	
	4,000	5'-4"	24'-0"	30,000	10'-0"	51	
	4,000	6'-0"	19'-0"	30,000	10'-6"	46	
	4,000	8'-0"	10'-8"	40,000	12'-0"	47	
	5,000	6'-0"	23'-10"	50,000	12'-0"	59	
	5,000	8'-0"	13'-4"	50,000	12'-6"	54	
	6,000	6'-0"	28'-8"	60,000	12'-0"	71	
	6,000	8'-0"	16'-0"	60,000	12'-6"	65	
	8,000	10'-0"	14'-0"	60,000	13'-0"	60	
	8,000	8'-0"	21'-4"	70,000	13'-0"	72	

All Highland storage tank drawings
are available for viewing or
downloading in PDF or AutoCAD
DXF format at highlandtank.com

HighDRO[®] Vertical Tank Design Features



Volume Gallons	Dimens Diameter	sions Height
185	3'-2"	3'-4"
240	3'-2"	4'-0"
300	3'-2"	5'-0"
500	4'-6"	5'-5"
1,000	4'-0"	10'-9"
1,000	5'-4"	6'-0"
1,500	5'-4"	9'-0"
2,000	5'-4"	12'-0"
3,000	8'-0"	8'-0"
4,000	8'-0"	10'-6"
5,000	8'-0"	13'-4"
6,000	8'-0"	16'-8"
8,000	10'-0"	14'-0"
10,000	10'-0"	17'-0"
12,000	10'-0"	20'-6"
15,000	10'-0"	25'-6"
20,000	10'-0"	34'-0"
20,000	10'-6"	31'-0"
25,000	12'-0"	29'-8"
30,000	12'-0"	35'-6"
30,000	12'-6"	42'-9"
40,000	12'-0"	47'-6"
40,000	12'-6"	43'-8"
40,000	13'-0"	40'-4"
50,000	13'-0"	50'-6"
57,500	14'-0"	50'-0"

Vertical Tank Bottoms



Flat - the most commonly used tanks in the industry; requires a flat surface to give full support.



Dish with Ring Base or Angle Legs offers near complete drainage; used when head pressure is required at the output.



Cone with Ring Base or Angle Legs - offers complete drainage.



ASME Pressure Vessels

Custom Quality in Every Detail

Highland Tank is certified to manufacture unfired pressure vessels whose construction complies with ASME Code, Section VIII, Division I and welding in accordance with Section IX. Highland labels ASME vessels with a "U" for unfired pressure vessels with authority granted by the National Board of Boiler and Pressure Vessel Inspectors.

We are also certified to make alterations or perform repairs on vessels in operation, in which case an "R" label would be applied. Additional codes such as NFPA and AWWA may affect design requirements if the vessel is to be used for water service.

An ASME pressure vessel's materials of construction consist of SA516 GR70 carbon steel and type 304 and 316 stainless steel (as well as the "L" grades). Heads are typically ASME 2:1 semi-elliptical. As each ASME pressure vessel application is unique, specific vessel construction requirements are calculated by Highland Tank's engineers using a formula that takes into consideration steel thickness, vessel diameter, design/operating pressure and joint efficiency. Special requirements, such as lethal service, vibration, and high and low operating temperature limits are some of the considerations taken into account when designing a working vessel.

Quality Control

Our ASME code-approved quality control program monitors the design, materials, construction, welding and testing methods employed throughout the vessel production. Once a vessel has been constructed, tested and approved by an Authorized Inspector, a registration is filed with the National Board of Boiler and Pressure Vessel Inspectors.

Applications

ASME Pressure Vessels are manufactured for a wide range of municipal, commercial and industrial applications. They are typically built for either horizontal or vertical installations.

Horizontal ASME vessels can be installed aboveground with saddle mounts. Vertical vessels have legs or ring bases. Both can be equipped with many accessories, including:

- OSHA compliant ladders, stairs, walkways and catwalks
- Gauging, pumping and control systems

When installed underground, ASME vessels usually require advanced external corrosion protection systems or waterstops for breakthrough basement or vaulted installation.

Capabilities at a Glance

Orientation

Vertical or Horizontal

Installation Aboveground or Underground

Diameter 6" to 14'-0"

Length Up to 90'-0"

Maximum Weight 80 Tons

Steel Rolling

Up to 1-1/4" thick x 120" wide

Material

- Carbon Steel
- Stainless Steel: Type 304, 304L, 316 and 316L

Finishes

- No. 1 Hot rolled, annealed and passivated 3/8" and thicker
- No. 2B Cold rolled, annealed, pickled & passivated with additional polished rollers pass

Penetrations

- Threaded couplings up to 4" diameter
- Flanged fittings 1/2" and up

Manways

 12" X 16" elliptical manway is typical for an inspection opening

Surface Preparation

SSPC SP-6, SP-10, SP-5

Internal Linings

- Epoxy Phenolic
- High-solids Epoxy
- High-solids Polyurethane
- Zinc-Epoxy
- Vinyl Ester
- Calcium Aluminate Cement
- Rubber, PVC and other sheet linings

External Coatings

- Primer Paint
- High-solids Epoxy/Polyurethane
 Finish Paint

External Corrosion

Protection System

• HighGuard

Testing

Radiography - Spot or Full

Tank Support Systems

- Horizontal
- UL Saddles
- Vertical
- Ring Bases
- Angle Legs





Chlorine Contact Vessels



Chlorine Contact Tanks (CCT) are typically used with chlorine injection equipment in a well water system to help comply with strict new drinking water standards. This process vessel is specifically designed to achieve sufficient contact time between the injected chlorine and the water that needs disinfection.

Chlorination is the most common disinfection method for public and private drinking water systems. This disinfection process is necessary to kill disease-causing bacteria in the water. In order to be sure the added chlorine is killing the bacteria, the water must have sufficient contact time with the injected chlorine for proper disinfection. CCT have an inlet on one end and an outlet on the opposite end. The water flows through a series of internal mixing baffles and perforated high efficiency mixing baffles to lengthen the contact time water has with the injected chlorine before it leaves the vessel.

Highland Tank manufactures two models of CCT. The standard models achieve 50% efficiency which is considered average contact time for chlorination. The premium models achieve an impressive 70% efficiency. Both designs ensure full chlorine/water mixing and sufficient contact time. The high-efficiency models' hydraulic flow characteristics are proven to meet or exceed industry standards by providing an efficient engineered system to meet requirements of the EPA's Surface Water Treatment Rule. Use of these superior CCT results in superior contact time and decreased treatment costs.

Sizing for CCT is related to the flow rate and tank efficiency. The standard 50% efficiency CCT typically require a larger vessel than the 70% efficiency models. Highland Tank's CCT are lined with maintenance- free, non-contaminating epoxy or polyurethane lining, approved by NSF as suitable for the storage of potable water.

Efficient Performance Standards for Specific Site Requirements



Superior Performance CCT

This premium CCT meets a 0.7 baffling factor resulting in superior chlorine contact time. This vessel obtained approval for PA, NJ and NY DEP Bureau of Water Management for Ground Water Rule 4-Log Treatment Demonstration.

Standard Performance CCT



Highland Tank's standard performance CCT features a 0.5 baffling factor.

This is a typical design for providing the required contact time for most states and municipalities.



Fire Protection Vessels



Fire Protection Tanks (FPT) are hydropneumatic water storage tanks specifically designed for use in private fire protection systems.

These ASME pressure vessels are required by fire codes in many commercial, industrial and institutional buildings for use with automatic sprinkler systems for fire suppression. FPT are designed, fabricated, tested, inspected and installed in accordance with the National Fire Protection Association NFPA Standard No. 22, "Water Tanks for Private Fire Protection." During normal operation, this ASME pressure vessel is filled with water to 2/3 the volume of the tank and then pressurized with air to 125 psi. FPT can be located underground with all of the fittings located on one head that protrudes into the basement or a vault. The outlet flange is located at the bottom of the vessel near this head and projects a minimum of 4" into the vessel. A water-stop with link-seal prevents water intrusion.

FPT are fully compliant with factory applied internal and external coatings with optional cathodic protection system on the buried end of the vessel.





Hydropneumatic Vessels



Hydropneumatic Tanks (HPT) are ASME vessels that contain both water and air under pressure. They provide an adequate "quick demand" water supply and help regulate proper system pressure range, both necessary for the efficient operation of a water supply system.

They are used in large capacity pumping systems as "buffer tanks" to control surges caused by pump start-ups and shutdowns, and they absorb water hammer shocks due to rapid valve actuations eliminating catastrophic failure of pipeline, pumps, valves and system control loss. Other common applications are in well water systems and fire protection systems.

HPT are lined with epoxy or polyurethane potable water linings. They are often located aboveground or underground, with one head protruding into a vault or basement. All of the fittings are located on the head located inside the building or vault. Vessels installed underground are furnished with advanced corrosion protection systems.

Hydropneumatic Vessel Sizing Guide



Volume 100% - 2/3		Dime	Dimensions Straight Shell		Overall	T Dimension	
G	allo	ns	Diameter	Length	Inches	Length	@2/3Volume
300	-	200	3'-0"	5'-0"	10.5	6'-9"	22"
500	-	330	3'-6"	6'-0"	12.0	8'-0"	26"
1,000	-	667	4'-0"	10'-0"	13.5	12'-3"	29"
1,500	-	1,000	4'-0"	15'-6"	13.5	17'-9"	29"
2,000	-	1,320	4'-0"	21'-0"	13.5	23'-3"	29"
2,000	-	1,320	4'-6"	16'-0"	15.0	18'-6"	33"
3,000	-	2,000	4'-0"	32'-0"	13.5	34'-3"	29"
3,000	-	2,000	4'-6"	24'-6"	15.0	27'-0"	33"
3,000	-	2,000	5'-0"	20'-0"	16.5	22'-9"	36"
4,000	-	2,640	5'-0"	28'-0"	16.5	30'-9"	35"
4,000	-	2,640	6'-0"	18'-0"	19.5	21'-3"	44"
5,000	-	3,300	6'-0"	24'-0"	19.5	27'-3"	42"
5,000	-	3,300	7'-0"	16'-0"	22.5	19'-9"	51"
6,000	-	4,000	6'-0"	28'-0"	19.5	31'-3"	44"
6,000	-	4,000	7'-0"	20'-0"	22.5	23'-9"	51"
7,000	-	4,620	7'-0"	24'-0"	22.5	27'-9"	50"
7,500	-	5,000	7'-0"	25'-0"	22.5	28'-9"	52"
7,500	-	5,000	8'-0"	18'-6"	25.5	22'-9"	59"
8,000	-	5,280	7'-0"	27'-0"	22.5	30'-9"	51"
8,000	-	5,280	8'-0"	20'-0"	25.5	24'-3"	58"
9,000	-	6,000	7'-0"	30'-0"	22.5	33'-9"	52"
9,000	-	6,000	8'-0"	22'-2"	25.5	26'-5"	60"
10,000	-	6,600	8'-0"	25'-0"	25.5	29'-3"	59"
12,000	-	8,000	8'-0"	31'-0"	25.5	35'-3"	59"
15,000	-	10,000	8'-0"	40'-0"	25.5	44'-3"	58"
20,000	-	13,200	10'-0"	32'-0"	31.5	37'-3"	74"
25,000	-	16,500	10'-6"	38'-0"	33.0	43'-6"	75"
30,000	-	20,000	10'-6"	44'-0"	33.0	49'-6"	79"

Notes:

1. Tanks are built in accordance with the latest edition of the ASME Unfired Pressure Vessel Code. All ASME vessels are welded, tested, and inspected per ASME Code requirements and the stamped name plate.

2. Thicknesses are calculated per ASME Section VIII, Division I – UG 27.

3. Fitting details/locations are typical.

4. 11" X 15" elliptical manway is typical for an inspection opening. All lined vessels require a 12" X 16" minimum elliptical manway.

5. Tanks with different/larger volumes, dimensions and pressures are available upon request.

6. ASME stamped vessels are required in most states. Where applicable, non-code hydropneumatic tanks are available upon request.

Pre-Engineered Design Options

Chlorine Contact Tanks (CCT)

A vessel that provides sufficient time for chlorine to achieve full disinfection before the water enters the distribution network. Required chlorine contact time is usually 30 minutes (CT = 30 mg-min/L).



Fire Protection Tanks (FPT)

ASME pressure vessel used solely as a water supply to automatic sprinkler systems. Vessels are designed and installed in accordance with NFPA Standard No. 22, "Water Tanks for Private Fire Protection." A sprinkler system secondary water supply may have duration of 30 minutes.



Hydropneumatic Tanks (HPT)

A vessel for storing water prior to distribution in a water supply system, whereby the water system pressure is maintained between specified pressure ranges (also called ASME pressure vessels).



Heated & Chilled Water Vessels



Hot Water Tanks (HWT) are used in commercial buildings, institutional facilities and assorted industries that require a constant supply of hot water. Water is typically heated and stored in this ASME vessel during periods of low demand thereby providing an adequate supply of hot water during periods of maximum demand.

Applications

- Apartment and Commercial Buildings
- Hotels
- Institutional Facilities Schools, Universities, Hospitals, Prisons
- Industrial Processes
- Sports Complexes
- Hospitals
- Restaurants
- Laundry Facilities

HWT can be equipped with all the necessary connections required for installation with most water heaters, boilers or other water-heating devices.

They are available as vertical or horizontal type in a wide range of sizes. We can manufacture HWT to our standard specifications or custom design fabrication for those tough projects.

HWT are typically customized for a specific application. These vessels are available from 300 to 60,000 gallons. Please contact Highland Tank to discuss your specific needs.

Standard Features

- Manufactured to ASME Code Standard operating pressures range from 60 to 75 psi; standard design pressures are 100, 125 and 150 psi
- 12" X 16" minimum elliptical manway
- Standard connections from 2" to 3" NPT; 4" to 8" flanges
- · Exterior alkyd shop primer
- Interior NSF approved for potable water:
 - Cement Lining
 - High-temperature epoxy phenolic coating

Options

- Tank Support Systems
 - Horizontal UL Saddles;
 - Vertical Ring Bases or Angle Legs
- External thermal insulation
 - Spray-on polyurethane foam with acrylic sealer (R16 @ 2")
 - External fiberglass batt with metal jacketing (R8 @ 2")

Exceptional Efficiency and Economy in Every Day Performance



Applications

Chilled Water Tanks (CWT) are used with large HVAC installations, resulting in fewer cycles of the compressor and better temperature control overall. The chilled water is used to cool and dehumidify air in sizable commercial, industrial and institutional facilities.

At high-tech data centers, chilled water storage tanks are required for uninterrupted cooling of computer systems and associated components, such as telecommunications and storage systems. A properly sized CWT adds the necessary volume to "buffer" the cooling system and allows it to operate at peak efficiency. When applied to contemporary chilled thermal storage technology, CWT allow the user to time shift the electrical load of the system from the peak day periods to off peak night time periods.

CWT are typically customized for a specific application. These vessels are available from 300 to 60,000 gallons. Please contact Highland Tank to discuss your specific needs.

Standard Features

- Manufactured to ASME Code; standard design pressure is 125 psi
- 12" X 16" minimum elliptical manway
- Standard connections from 2" to 3" NPT; 4" to 8" flanges
- Exterior alkyd shop primer
- Interior NSF approved for potable water:
 - High-temperature epoxy coating
 - Cement Lining

Options

- Vertical Tank Support Systems
 - Ring Bases
 - Angle Legs
- External thermal insulation
 - Spray-on polyurethane foam with acrylic sealer
 - External fiberglass batt with metal jacketing

Chilled Water Tanks are designed for chilled water systems with insufficient water volume capacity, in relation to the chiller capacity. These tanks increase the capacity of the chilled water system and stabilize the return water temperature.

Boiler Blowdown Vessels



Boiler Blowdown Tanks (BBT) are used to control blowdown of a boiler so that the level of dissolved solids is minimized to reduce scaling in the boiler. BBT also enable high-pressure water to safely flash to steam. Required boiler maintenance includes periodic removal of water to control the buildup of suspended solids and particulates as well as the concentration of treatment chemicals. Surface water blowdown is often done continuously to reduce the level of dissolved solids and bottom blowdown is performed periodically to remove sludge from the bottom of the boiler. The amount of blowdown necessary depends on boiler operating pressure, amount of makeup water, impurity levels in the makeup water and the dissolved solids concentrations that a given boiler can tolerate.

A properly designed BBT has a capacity of not less than twice the volume of the boiler water so that the boiler can be blown down completely without any restriction.

The process of removing this water is referred to as boiler blowdown. Boiler blowdown can also refer to the discharged water itself.

Blowdown water has the same temperature and pressure as the boiler water. Local laws usually do not permit this high temperature and pressure water to be discharged into the sewer. An acceptably designed blowdown tank system reduces the temperature by mixing cold water with the effluent. It is a general rule that the temperature of the water leaving the BBT shall not exceed 150 °F and 5 psig.

Boiler Blowdown Vessel Sizing Guide



Standard Features

- Manufactured to ASME Code for a working pressure 1/4 the maximum working pressure of the boiler
- Blowdown Inlet:
 - Tangential Blowdown Inlet with Wear Plate or Internal Baffle at the blowdown inlet so that the steam distribution will be equalized and directly discharged against the shell of the tank
- Tank Vent (sized for specific boiler or local code)
- 12" X 16" minimum elliptical manway

- Bottom Overflow Drain Outlet with Siphon Breaker
 - Built-in siphon break
 - Trapped so that water is drained within 6" from the bottom of the tank
- Cleanout Drain: 2" NPT minimum provided at the bottom of the tank
- Primer paint

Options

Tank Support Systems:

- Horizontal UL Saddles
- Vertical Ring Bases, Angle Legs

Dimensions			Drain	Drain Cleanout**
SSH	OAH	A	B	C
30"	70"	4"	3"	2"
42"	85"	5"	3"	2"
48"	94"	6"	4"	2"
66"	116"	6"	4"	2"
72"	125"	6"	4"	2"
96"	155"	10"	4"	2"
	Dimensions SSH 30" 42" 48" 66" 72" 96"	SSH OAH 30" 70" 42" 85" 48" 94" 66" 116" 72" 125" 96" 155"	Dimensions Vent* SSH OAH A 30" 70" 4" 42" 85" 5" 48" 94" 6" 66" 116" 6" 72" 125" 6" 96" 155" 10"	Dimensions Vent* Drain Outlet* SSH OAH A B 30" 70" 4" 3" 42" 85" 5" 3" 48" 94" 6" 4" 66" 116" 6" 4" 72" 125" 6" 4" 96" 155" 10" 4"

* RFSO, ** NPT.

Custom size and pressure BBT are available, please contact Highland Tank for details.

Cleanout Drain (C)

Support Legs

Air Receiver Vessels



Air Receivers Tanks (ART) are used in compressed air systems to store the compressed air and to permit pressure to be equalized in the system.

ART are sized to best supplement the air compressor operation, typically one gallon of storage for each Actual Cubic Feet per Minute (ACFM), for the rated compressor output:

A more exact sizing method is:

 $V=Cr\,x\,(\,Ci\,/\,Co\,)$

- $V = Air Receiver Volume (ft^3)$
- Cr = Compressor rating (ft³ / min. free air)
- Ci = Compressor Inlet Free Air (psia)
- Co = Compressor Outlet Pressure (psia)

After calculating the air receiver capacity, inlet and outlet connections can be determined based on the size of the compressor outlet connection.

Standard Features

- Manufactured to ASME Code. Standard design pressures are 125 and 150 psi. (Other pressure ratings are available)
- Inlet and Outlet connections (based on the compressor outlet connection dimensions)
- Bottom Drain Outlet
- Pressure Gauge connection
- Safety relief valve connection
- Inspection openings
- Exterior alkyd shop primer



Air Receiver Vessel Sizing Guide



 12" X 16" minimum elliptical manway

Special Fabrication

Custom Built to Your Specifications

Highland Tank specializes in various ASME Code and non-code, steel fabrications customized to meet your needs. Our comprehensive capabilities offer the accuracy, efficiency, control and convenience to single source all vessel and tank fabrication needs.

We can design, engineer, and fabricate those "one of a kind" vessels or tanks necessary for the successful operation of your facility. Additionally, we have the capability to perform complex engineering analysis required for code and non-code, carbon and stainless steel fabrication. From job entry to transport, Highland Tank has the dedication and experience to deliver the quality you expect.

Highland Tank leads the industry in state-of-the-art vessel and tank technology. At Highland Tank you will find an experienced engineering staff equipped to answer your questions and offer engineered designs tailored for unique applications.





Highland Tank specializes in ASME Code and non-code steel fabrications customized to meet your needs. Our engineering team at Highland Tank is equipped to answer questions and offer engineered designs for tailored applications. Highland Tank will design, engineer and fabricate "one-of-a-kind" vessels or tanks necessary for the successful operation of your facility.



Many storage and process tank needs today require customization. Highland Tank specializes in building tanks to meet a customer's specifications. Our expert staff will help accommodate everything from custom sizes, unique fitting requirements, ladders, stairs and platforms, multi-compartment tanks, and even unique dry chambers to house pumps, controls and other equipment. Custom fabrication is part of Highland Tank's signature customer service.



























Accessories

Customized To Meet Your Specific Needs

Highland Tank's accessory line is designed to augment our wide selection of HighDRO[®] Water Storage Tanks and ASME Pressure Vessels, making it easy to quickly and efficiently turn any of our tanks into a complete operating system.

1. Deadmen Anchoring System

Deadmen help anchor underground separator installations where there is potential for high water. They can be used with our standard underground separators from 550 to 60,000 gallons. (See pp. 54-55 for details).

2. Hold-Down Straps

Designed to secure separators in areas where high water levels may result in flotation. Hold-Down Straps are available in four different designs to accommodate specific installation requirements: Standard, Safety, Deadmen and Polyester. (See pp. 56-57 for details).

3. Tank Support Systems

These systems are designed to support the tank, keep it stationary and elevate the tank to minimize corrosion concerns and allow for easy visual inspection. Tank Support Systems are available in three different designs to accommodate specific installation requirements: UL Saddles, Supports and Skids. (See pp. 58-59 for details).

4. Ladders, Stairs, Platforms and Walkways

Internal and external ladders, stairs, platforms and walkways are designed to comply with strict OSHA specifications. Mounting brackets and other structural accommodations can be factory-fitted to facilitate field installation. (See pp. 60-61 for details).

5. Manways, Extensions, and Tank-Top Sumps with Double Ring Manways

Manways provide access to the tank and include a bolted cover and gasket. The cover provides a convenient location for fittings. Extensions and Tank-Top Sumps with Double Ring Manways are project specific. (See p. 62 for details).

6. Grade Level Manways (GLM)

Designed to AASHTO H20 requirements. Each manway is constructed of A36 steel plate from 10 ga. to 1/4" thick, with lids of 3/8" reinforced checkered steel plate. Round GLMs are available in sizes ranging from 12" to 48" diameter. Rectangular GLMs are available in widths from 48" to 72" and lengths from 48" to 150". (See p. 63 for details).

7. Insulation Systems

Selection includes external batt with metal jacket, external spray-on insulation or injected insulation. (See p. 59 for details).

8. Electric, Steam or Hot Water Thermal Fluid Heaters

These provide temperature control for heat sensitive fluids.

9. Complete Pump System Packages

These packages can be either platform or tank mounted.

10. Lift Stations

Comprised of the sump, pumps, level sensors and controls, pre-packaged lift stations engineered for easy installation, efficient operation and ease of maintenance are available.

11. Alarm and Control Panels

These provide a comprehensive panel selection for leak and level alarm.

12. Leak and Level Sensors

Leaks are prevented by a wide variety of sensors used to detect leaks or liquid levels.

Deadmen Anchoring System

Highland Tank's Deadmen Anchoring Systems are designed to secure water tanks and pressure vessels at installations. Polyester or steel Hold-Down Straps and concrete beams are used to anchor water tanks and pressure vessels to counteract their natural buoyant forces.

Polyester Hold-Down Straps

Polyester Hold-Down Straps are intended for underground use only. They are made from 3" wide 100% polyester webbing. These straps have a large reinforced loop at each end for connecting to the Concrete Deadmen Anchor hardware. A length of 1/2" diameter wire rope and six cable clamps are included with each strap for connecting the strap to one side of the concrete anchoring. A hook-tohook turnbuckle is used for attaching the strap to the anchoring on the other side.

Standard Features

- No strap liners are required because there are no metallic components in the strap system that can make contact with the tank
- Available without the cable, clamps, and turnbuckles, for use with Concrete Deadmen Anchors
- Available for tank diameters 3'-2" to 12'-0"





Deadmen Anchors are beams of reinforced concrete placed alongside the tank in the bottom of the excavation. The weight of the backfill on the Deadmen Anchors provides additional resistance to buoyancy forces acting on the tank. Properly installed Deadmen Anchors, when used exclusively with Polyester Hold-Down Straps and the supplied hardware, prevent tank flotation and cost less than a concrete bottom hold-down pad. Best of all, there is no delivery charge for Concrete Deadmen Anchors when they are shipped on the same truck along with a Highland storage tank.

Standard Features

- Designed to work with standard underground storage tanks from 500 to 50,000 gallons
- Utilize a 4,000 psi concrete mix reinforced with #4 rebar
- Dimensions: CDA-15: 120" L, 18" W, 12" H CDA-45: 120" L, 36" W, 18" H
- Volume: CDA-15: 15 cubic feet (approx.) CDA-45: 30 cubic feet (approx.)
- Weight: CDA-15: 2,200 pounds (approx.) CDA-45: 6,500 pounds (approx.)

Notes:

- 1. Above recommendations assume that tanks are buried at least 36" deep, have at least one access sump and are installed exclusively with Highland Polyester Hold-Down Straps.
- 2. To be effective, Deadmen Anchors must be placed outside the tank diameter and extend the full length of the tank.
- 3. A limited number of Deadmen Anchors require the installation of supplemental methods of restraint, such as 8" grade-level reinforced concrete pads (as recommended by PEI RP 100-11).

Tank Volume Gallons	Tank Dim Diameter	ensions Length	Required Deadmen	Required Straps
500	4'-0"	5'-5"	2	2
1,000	4'-0"	10'-9"	2	2
1,000	5'-4"	6'-0"	2	2
1,500	5'-4"	9'-0"	2	2
2,000	5'-4"	12'-0"	2	2
2,500	5'-4"	15'-0"	2	2
3,000	5'-4"	18'-0"	2	2
4,000	5'-4"	24'-0"	2	2
4,000	6'-0"	19'-0"	4	4
4,000	8'-0"	10'-8"	2	2
5,000	6'-0"	23'-10"	4	4
5,000	8'-0"	13'-4"	2	2
6,000	6'-0"	28'-8"	6	6
6,000	8'-0"	16'-0"	2	2
8,000	8'-0"	21'-4"	4	4
*8,000	10'-0"	14'-0"	2	2
10,000	8'-0"	26'-8"	6	6
*10,000	10'-0"	17'-0"	4	4
12,000	8'-0"	32'-0"	6	6
*12,000	10'-0"	20'-6"	4	4
15,000	8'-0"	40'-0"	8	8
*15,000	10'-0"	25'-6"	4	4
*20,000	10'-0"	34'-0"	6	6
*20,000	10'-6"	31'-0"	6	6
*25,000	10'-6"	38'-9"	8	8
*30,000	10'-6"	46'-0"	10	10
*40,000	12'-0"	47'-6"	10	10
*50,000	12'-0"	59'-6"	12	12
*60,000	13'-0"	60'-6"	12	12

*Model CDA-45 required.

CDA - 15

CDA - 45





Hold-Down Straps

This guide provides information about Steel Hold-Down Straps manufactured specifically by Highland Tank. The guide references dimensions of standard underground tanks. Also referenced are Hold-Down Strap specifications, recommended quantity and spacing, and anchor bolt requirements. Contractor-supplied anchor bolt sizes must be in accordance with this guide for proper fit and system performance.

This guide is intended only as an aid to professional engineers. Highland Tank recommends that underground storage tank anchorage systems be designed by a licensed professional engineer.

A. Standard Hold-Down Straps

are manufactured from mild-carbon steel with an adjustable turnbuckle and angle clip on each end for securing tanks in place. Neoprene rubber liners are supplied for electrical isolation and coating protection. Standard straps are sized so that when the turnbuckles are completely closed, there will be six (6") inches between the anchor pad and the tank bottom. Turnbuckles can be opened to allow up to twelve (12") inches of clearance.

B. Safety Hold-Down Straps

are designed to avoid having installation personnel in the excavation during tank placement. They are manufactured in two pieces and shipped connected with a threaded tie rod at top center. These straps are designed to be installed before placing the tank in the excavation. By loosening the tie rod, the two pieces are separated and each rotated 90° to 180° away from their original position. After the tank is positioned, the strap's sides are rotated back toward each other and tightened over the tank with the tie rod and nuts.



Reinforced Concrete Anchor Pad*

Steel Hold-Down Straps Sizing Guide

Tank		Hold-Down Strap		Anchor Bolt		
Volume	Tank Din	nensions	Required	Size	Centerline	Size
Gal.	Dia.	Length	Quantity	WxT	Spacing	Dia.
240	3'-2"	4'-0"	2	2" x .25"	2'-0"	.75"
300	3'-2"	5'-0"	2	2" x .25"	2'-6"	.75"
500	4'-0"	5'-5"	2	3" x .25"	2'-9"	.75"
1,000	4'-0"	10'-9"	2	3" x .25"	5'-4"	.75"
1,000	5'-4"	6'-0"	2	3" x .25"	3'-0"	.75"
1,500	5'-4"	9'-0"	2	3" x .25"	4'-6"	.75"
2,000	5'-4"	12'-0"	2	3" x .25"	6'-0"	.75"
2,500	5'-4"	15'-0"	2	3" x .25"	7'-6"	.75"
3,000	5'-4"	18'-0"	2	3" x .25"	9'-0"	.75"
4,000	5'-4"	24'-0"	2	3" x .25"	12'-0"	.75"
4,000	6'-0"	19'-0"	2	3" x .38"	9'-6"	1"
4,000	8'-0"	10'-8"	2	3" x .38"	5'-3"	1"
5,000	6'-0"	23'-10"	2	3" x .38"	11'-11"	1"
5,000	8'-0"	13'-4"	2	3" x .38"	6'-8"	1"
6,000	6'-0"	28'-8"	2	3" x .38"	14'-4"	1"
6,000	8'-0"	16'-0"	2	3" x .38"	9'-0"	1"
8,000	8'-0"	21'-4"	3	3" x .38"	7'-2"	1"
8,000	10'-0"	14'-0"	2	4" x .50"	7'-0"	1.25"
10,000	8'-0"	26'-8"	4	3" x .38"	6'-8"	1"
10,000	10'-0"	17'-0"	2	4" x .50"	8'-6"	1.25"
12,000	8'-0"	32'-0"	4	3" x .38"	8'-0"	1"
12,000	10'-0"	20'-6"	3	4" x .50"	6'-10"	1.25"
15,000	8'-0"	40'-0"	5	3" x .38"	8'-0"	1"
15,000	10'-0"	25'-6"	3	4" x .50"	8'-6"	1.25"
20,000	10'-0"	34'-0"	4	4" x .50"	8'-6"	1.25"
20,000	10'-6"	31'-0"	4	4" x .50"	7'-9"	1.25"
25,000	10'-6"	38'-9"	5	4" x .50"	7'-9"	1.25"
30,000	10'-6"	46'-6"	6	4" x .50"	7'-9"	1.25"
40,000	12'-0"	47'-6"	8	4" x .50"	6'-8"	1.25"
50,000	12'-0"	59'-6"	10	4" x .50"	6'-8"	1.25"
60,000	13'-0"	60'-6"	12	4" x .50"	5'-8"	1.25"

Note:

1. This information is provided as a service to our customers to assist with budgetary estimates.

2. Hold-Down Straps are designed to assist on boyancy restraint of fully installed and backfilled tanks.

3. Safety straps are required for use on all tanks 10'-0" diameter and larger when using steel Hold-Down Straps.

4. Underground storage tank anchorage systems should be designed by a licensed professional engineer for the particular geographic location, soil conditions and installation requirements of the specific jobsite. Highland Tank assumes no liability for errors or omissions in this information or for any consequential damages incurred by use or misuse of this guide.

5. Additionally, supplemental methods of restraint, such as grade-level reinforced concrete pads, should be designed in accordance with PEI/RP-100-11.

6. Refer to appropriate Highland Tank and Steel Tank Institute Installation Instructions for additional information.

Tank Saddles

Saddles allow for visual inspection of the entire tank.

UL Saddles

UL Saddles are designed for a specific diameter horizontal storage tank and fabricated to the latest UL-142 design standards. They can be welded directly to the tank or shipped loose.

Saddle Features

- Heavy-duty UL-142 steel construction for long-term durability
- Standard saddles provide 6" of clearance and are available up to 12" high. Saddles higher than 12" must be protected with a fire resistant material with a two-hour fire rating
- Only two properly positioned saddles per tank required
- Four 1-1/8" diameter bolt holes are provided to secure the saddles to the concrete pad or piers
- Saddles are painted to the same specifications as the tank

Secure Fluid Storage

Our tank saddles are used to provide longitudinal support, maintain the tank's position and elevation and help minimize corrosion. They also provide clearance for complete visual inspection of the underside of the tanks.

Highland's integral seal-welded tank saddles are constructed in accordance Underwriters' Laboratories, Inc. and designed to support the full load of tank and contents. Our new two saddle system is easy installation and service. Additionally, the tank saddles can be anchored to concrete pad to help protect the tank from movement or floatation.



Tank Saddle Assembly Specifications



To ensure adequate support on horizontal tanks, follow the guidelines for saddle spacing.

Tank	Base Plate	Dimensions	Bolt Hole Locations from Centerline	
Diameter	Length(L)	Width(W)	Front(F)	Side(S)
3'-2"	35"	8"	7.5"	2"
4'-0"	44"	8"	12"	2"
5'-4"	58"	8"	14"	2"
6'-0"	65"	8"	17.5"	2"
8'-0"	87"	10"	28.5"	2"
9'-0"	98"	10"	34"	2"
10'-0"	108"	10"	39"	2"
10'-6"	114"	10"	42"	2"
12'-0"	130"	12"	50"	3"
12'-6"	114"	10"	42"	2"
13'-0"	130"	12"	50"	3"

Insulation Systems



The storage tank and saddles must be designed to accommodate loadings resulting from the weight of the tank and its contents, external equipment, and environmental conditions. In areas subject to damaging wind, water, or earthquakes the design of the supporting structure and connections for the storage tank shall require special engineering consideration.

The design and construction of tank supports and foundations is critical and should only be undertaken and supervised by competent professionals.

Note:

 Do not rely on tack or seal-welded saddles as a means for securing a tank in flood prone areas. A hold-down system, connected to an adequately sized anchor pad is recommended.

A properly designed hold-down strap system with adequately sized reinforced concrete hold-down pad is recommended to secure a tank in flood prone areas.

Custom Insulated Tanks and Vessels

Custom thermal insulation can be applied to tanks and vessels to help reduce energy costs associated with heating or maintaining heat in the process for efficient and effective operation.

We have multiple methods for insulating tanks and vessels depending on your specific requirements:

External Spray-on Insulation System

- A complete 360° wrap of sprayed-on insulating material (nominal thickness- 1.5")
- A protective finish coating over the foam insulation to prevent UV damage

Injected Insulation System

- A complete 360° second wrap, steel skin
- The interstice is injected with a special time-activated foam insulating material that expands to completely fill all voids and eliminate air pockets

External Batt with Jacket Insulation System

- A complete 360° wrap with insulating batts of mineral wool, fiberglass or ceramic material
- A complete 360° wrap with a 24-26 gauge aluminum skin to ensure insulation integrity



External Spray-on Insulation System



External Batt & Skin Insulation System

Ladders, Platforms and Walkways

Ladders, platforms and walkways are designed to comply with strict OSHA specifications. Carbon steel fabrication with a painted finish is standard. Stainless steel or galvanized finish is available upon request. Mounting brackets and other structural accommodations can be factory-fitted to facilitate field installation. OSHA compliant interior access ladders require a properly sized access manway for safety clearance. OSHA compliant Standard or Caged External Access Ladders are designed for access to the tank top, fill port,

manways or tank appurtenances. Handrails and provisions for anchoring



Vertical Tank - External Ladder Ladders Up to 20 Ft. **Open Ladder**



Uncaged 0 to 20 Ft. / Caged 20 to 30 Ft.



Step-off Platform

Horizontal Tank - External Ladder



Vertical Tank - External Ladder Ladders above 30 Ft.

Note: OSHA compliant internal ladders measure 16" wide and external ladders measure 24" wide.

Stairways and Ships Ladders

Highland Tank fabricates standard and custom stairs to facilitate access to tank fill ports and manways. OSHA standard design stairways provide access to the top of the tank from a platform attached to one end of the tank and include non-skid fiberglass grating on the stair treads and platforms. Handrails and provisions for anchoring stairway to a support pad are also included. In addition, Highland will manufacture Ships Ladders for job sites with limited space and can custom fabricate ladders, platforms and walkways to suit your site-specific needs.

Model	Tank	Nom	inal Length	Platform Height
S or SL	Diameter	Stairs	Ships Ladders	From Support Pad
30	4'-0"	29.688"	17"	30"
47	5'-4" & 6'-0"	47.25"	26"	47"
72	8'-0"	72.625"	41"	72"
88	10'-0"	88.813"	50"	88"
108	12'-0"	108.625"	62"	108"

Stairways



Standard Design Stairs





Top of Tank Access Perpendicular to Tank Head



Ships Ladders



Top of Tank Access Perpendicular to Tank Head



Top of Tank Access Parallel to Tank Head





Manways and Manway Extensions

Manways are manufactured and protected against corrosion using the same methods and quality control procedures as the storage tank. The welding and fabrication specifications are in strict accordance with Underwriters' Laboratories, Inc. and OSHA. By manufacturing our own manways, covers and extensions, we assure our customers of the same high quality as in our tanks.

Manways are available in standard 18", 20", 24", 30", 36", 42" and 48" diameters. Larger diameter cylindrical and custom rectangular manways are also available. Manway assemblies include the bolted cover and gasket. The cover provides a convenient location for fittings. Four inch diameter NPT heavy- duty forged fittings are standard.

When ordering, specify manway cover fitting arrangement. Manway extensions lengths can vary and are made to order.



Diameter ID OD		Thickness Manway/Lid	Bolt Size	Number Bolts	Bolt Circle
18"	24"	0.25"-0.25"	0.5"	18	21"
20"	26"	0.25"-0.375"	0.5"	24	23"
24"	30"	0.25"-0.375"	0.5"	24	27"
30"	36"	0.375"-0.375"	0.5"	42	34"
36"	42"	0.375"-0.375"	0.5"	42	40"
42"	48"	0.375"-0.375"	0.5"	52	45"
48"	54"	0.375"-0.375"	0.5"	60	51"







Grade Level Manways

Grade Level Manways (GLM) are designed to AASHTO H-20 requirements. Round GLMs are available in sizes ranging from 12" to 48" diameter. Rectangular GLMs are available in lengths from 48" to 150" and widths from 48" to 72".

Each manway is constructed using A36 steel plate from 10 ga. to 1/4" thick. Standard manways are fabricated with a 12" skirt depth and fitted with 1.5" x 2" x 3" steel concrete anchors seal welded to the manway skirt to ensure a secure installation. Standard manway lids are constructed of 3/8" reinforced checkered steel plate. Optional 3/8" checkered plate reinforced aluminum lids are available. Steel components receive a brush blast and are coated with black enamel paint. Optional polyurethane or epoxy coatings are available.

Rectangular manways are custom fabricated to site-specific requirements. Custom diameters and depths are available upon request.

Round

Model Number	l Skirt I.D. Inches	Nominal Diamete Collar I.D. Inches	r Lid O.D. Inches	Skirt Thickness
GLM-12	12"	14.5"	14"	10ga
GLM-18	18"	20.5"	20"	7ga
GLM-24	24"	26.5"	26"	7ga
GLM-30	30"	32.5"	32"	7ga
GLM-32	32"	34.5"	34"	7ga
GLM-36	36"	38.5"	38"	7ga
GLM-42	42"	44.5"	44"	.25"
GLM-48	48"	50.5"	50"	.25"

Rectangular

Model	Number of Doors	Maximum Overall Length	Skirt Thickness
R-GLM-48	1	48"	.25"
R-GLM-60	2	60"	.25"
R-GLM-90	3	90"	.25"
R-GLM-120	4	120"	.25"
R-GLM-150	5	150"	.25"



Tank Connections



- Flanged fittings also available in other configurations
- Available in all standard steel pipe sizes
- Available as extras in standard steel pipe sizes from 1/8" to 6" nominal

Please contact Highland Tank for all other fitting requirements



**Half Coupling



150 Pound Screwed Flange Fitting



**Full Coupling



Slip-on Welding Flange 150 Pound



150 Pound Welding Neck Flange

Pipe Size	Α	В	С	D	Е	F	G	Bolt No.	Diameter
0.5"	3.5"	0.4375"	1.375"	2.375"	.625"	1.875"	0.84"	4	.5"
0.75"	3.875"	0.5"	1.6875"	2.75"	0.625"	2.0625"	1.05"	4	.5"
1"	4.25"	0.5625"	2"	3.125"	0.6875"	2.1875"	1.32"	4	.5"
1.25"	4.625"	0.625"	2.5"	3.5"	0.8125"	2.25"	1.66"	4	.5"
1.5"	5"	0.6875"	2.875"	3.875"	.875"	2.4375"	1.90"	4	.5"
2"	6"	0.75"	3.625"	4.75"	1"	2.5"	2.38"	4	.625"
2.5"	7"	0.875"	4.125"	5.5"	1.125"	2.75"	2.88"	4	.625"
3"	7.5"	0.9375"	5"	6"	1.8125"	2.75"	3.50"	4	.625"
3.5"	8.5"	0.9375"	5.5"	7"	1.25"	2.8125"	4.00"	8	.625"
4"	9"	0.9375"	6.1875"	7.5"	1.3125"	3"	4.50"	8	.625"
5"	10"	0.9375"	7.3125"	8.5"	1.4375"	3.5"	5.58"	8	.75"
6"	11"	1"	8.5"	9.5"	1.5625"	3.5"	6.63"	8	.75"
8"	13.5"	1.125"	10.625"	11.75"	1.75"	4"	8.63"	8	.75"
10"	16"	1.1875"	12.75"	14.25"	1.9375"	4"	10.75"	12	.845"
12"	19"	1.25"	15"	17"	2.1875"	4.5"	12.75"	12	.875"
14"	21"	1.375"	6.25"	18.75"	2.25"	5"	14.00"	12	1"
16"	23.5"	1.4375"	18.5"	21.25"	2.5"	5.5"	16.00"	16	1"
18"	25"	1.563"	21"	22.75"	2.6875"	5.5"	18.00"	16	1.125"
20"	27.5"	1.6875"	23"	25"	2.875"	5.6875"	20.00"	20	1.125"
24"	32"	1.875"	27.25"	29.5"	3.25"	6"	14.00"	20	1.25"

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*Flanged Nozzle

Standard Tank Head Designs

Highland Storage Tank and ASME Pressure Vessel heads are of superior quality, value and craftsmanship. Our heads are fabricated of either A36 and SA516 Grade 70 carbon steel and 304, 304L, 316 or 316L stainless steel. Thicknesses range from 14 gauge to 1-1/4 inch.

Three styles of tank heads are available in diameters from 2'-0" to 14'-0":



Standard Flat-flanged Heads These cost effective heads are commonly used in applications where the tank will be operated at atmospheric pressure. The head's flange fits precisely inside the tank shell to form a strong lap-welded joint.



Standard Flanged & Dished Heads When applications require slightly higher operating pressures, our non-ASME flanged & dished design gives the tank the most strength without adding thickness. The lap-welded joint between the inner head flange and the outer tank shell provide superior "ribbed" strength.



ASME Semi-elliptical Heads These superior heads are designed, engineered and manufactured to individual customer's application and specifications for pressure conditions. Tolerances comply with ASME requirements. These heads have a 2:1 diameter to depth ratio and are butt-welded to the tank shell.

Capacity of Shell, Gal.		Capacity of	Head, Gal.	Depth of Dish, Inches		
per ft.	per in.	Standard Dished	ASME Dished	Standard Dished	ASME Dished	
23.5	1.96	8	8	4.4375"	4.4375"	
36.7	3.06	14	14	5.1875"	5.1875"	
52.9	4.4	22	24	6"	6.625"	
72	6	33	35	6.8125"	7.4375"	
94	7.8	46	50	7.625"	8.1875"	
119	9.9	63	71	8.4375"	9.625"	
147	12.3	82	93	9.25"	10.4375"	
178	14.8	106	119	10"	11.1875"	
211	17.6	133	157	10.8125"	12.625"	
248	20.7	165	193	11.625"	13.4375"	
288	24	201	244	12.4375"	14.8125"	
330	27.5	242	293	13.25"	15.625"	
376	31.3	288	347	14.0625"	16.4375"	
424	35.4	340	422	14.8125"	17.8125"	
476	39.7	398	490	15.625"	18.625"	
530	44.2	461	566	16.4375"	19.4375"	
587	49	531	669	17.25"	20.8125"	
648	54	608	761	18.0625"	21.625"	
711	59.2	692	862	18.875"	22.4375"	
777	64.8	783	1023	19.6875"	24.4375"	
846	70.5	882	1145	20.4375"	25.25"	
	Capacity of per ft. 23.5 36.7 52.9 72 94 119 147 178 211 248 288 330 376 424 476 530 587 648 711 777 846	Capacity of Shell, Gal. per ft. per in. 23.5 1.96 36.7 3.06 52.9 4.4 72 6 94 7.8 119 9.9 147 12.3 178 14.8 211 17.6 248 20.7 288 24 330 27.5 376 31.3 424 35.4 476 39.7 530 44.2 587 49 648 54 711 59.2 777 64.8 846 70.5	Capacity of Shell, Gal. per ft.Capacity of I Standard Dished23.51.96836.73.061452.94.42272633947.8461199.96314712.38217814.810621117.613324820.71652882420133027.524237631.328842435.434047639.739853044.2461587495316485460871159.269277764.878384670.5882	Capacity of Shell, Gal. Capacity of Head, Gal. per ft. per in. Standard Dished ASME Dished 23.5 1.96 8 8 36.7 3.06 14 14 52.9 4.4 22 24 72 6 33 35 94 7.8 46 50 119 9.9 63 71 147 12.3 82 93 178 14.8 106 119 211 17.6 133 157 248 20.7 165 193 288 24 201 244 330 27.5 242 293 376 31.3 288 347 424 35.4 340 422 476 39.7 398 490 530 44.2 461 566 587 49 531 669 648 54 608	Capacity of Shell, Gal. per ft.Capacity of Head, Gal. Standard DishedDepth of Dis Standard Dished23.51.96884.4375"36.73.0614145.1875"52.94.422246"72633356.8125"947.846507.625"1199.963718.4375"14712.382939.25"17814.810611910"21117.613315710.8125"24820.716519311.625"2882420124412.4375"33027.524229313.25"37631.328834714.0625"42435.434042214.8125"47639.739849015.625"53044.246156616.4375"6485460876118.0625"71159.269286218.875"77764.8783102319.6875"	

Proud Commitment to You

Highland Tank is committed to building successful, long-standing relationships with our customers. We are dedicated to providing water tanks and pressure vessels of the highest craftsmanship and performance. Within a business of ever-changing technology, we are constantly striving to exceed all your expectations.

Our family owned and managed business formed a humble philosophy many years ago that continues to hold true: manufacture a solid product at a competitive price and stand behind it with unparalleled service. Our hard work and dedication has helped to develop the high quality, dependability and craftsmanship put into every product we manufacture.

Engineering depth, state-of-the-art equipment and skilled craftsmen with old-fashioned pride and the traditional American work ethic have given us the tools needed to maintain our dedication to quality production.

Visit highlandtank.com where you can access product literature, CADD drawings, specifications, sizing calculators and more.

An American Manufacturer Proven to Stand Behind its Products







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Our mission

Highland Tank's mission is to engineer and manufacture quality products while providing innovative solutions through relationships founded upon integrity and excellence in customer service.

