GREASE REMOVAL SYSTEMS



Grease Recovery Units Grease Interceptors Strainer Baskets Solids Removal





Proudly made in America

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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Highland Tank Grease Removal Devices

The Most Complete Line in the Industry

Since 1946, Highland Tank has been on the leading edge of tank technology. Initially, Highland primarily fabricated fuel storage tanks. In 1986, Highland Tank entered a new era of wastewater treatment tank fabrication by developing our patented Oil/Water Separator to comply with more stringent environmental regulations on water pollution. For over twenty years, Highland Tank has provided innovative solutions for all types of commercial and industrial wastewater discharge problems.

In 2000, Highland Tank acquired Lowe Engineering Co., the recognized pioneer of the Grease Recovery Unit (GRU). This patented device has been used for over 25 years to recover fats, oils and grease (FOG) from wastewater discharged from quick-serve restaurants and large commercial and institutional kitchens found in casinos, hospitals, schools and many food service establishments (FSE). With this acquisition, Highland Tank introduced its comprehensive Grease Removal Systems product line featuring the GreaseStopper® Automatic Grease Interceptor (based on the original Lowe Engineering GRU) and the PGI Passive Grease Interceptors - a complete line of single, double and triple basin gravity grease interceptors.

As our Grease Removal Systems Division grew, we expanded our grease removal systems product line to include Manual Grease Interceptors, Strainer Baskets, Coarse Solids Strainers and Lift Stations.

Highland Tank now offers the most complete line of products specifically designed for removal of FOG and oily food waste from wastewater generated by FSE and food production/processing industries in the United States.







Manufacturing Expertise

Experience

As the leader in the steel tank industry, Highland Tank carried its commitment to quality and service to a new audience with the advent of the Grease Removal Systems Division. Our experience with wastewater treatment process tanks was a natural transition.

The acquisition of one of the original GRD manufacturers and the innovation of Highland Tank's team of professionals has allowed for the development and production of one of the industry's most advanced grease removal units -GreaseStopper®Automatic Grease Interceptor. This state-of-the-art product is the flagship of the most complete line of grease removal systems in the industry.

Quality Assurance

All of our products are backed by our helpful support staff to ensure quality throughout every phase of your project. Highland Tank's team of professionals in design, engineering, fabrication, sales, delivery and service provide you with outstanding solutions for your liquid storage challenges.

Our products are competitively priced and readily available from our national distribution network and six manufacuring facilities.

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 highly customized products required in today's world. We are constantly taking steps to lead the industry and stay on the cutting edge. Even in economic times when many companies are cutting back and downsizing, Highland Tank remains committed to our clients. Our latest addition is a new, large, state-of-the-art facility that will allow us to build the larger, heavier tanks and vessels that are in demand. This is just one more reason Highland Tank remains the leader in steel tank manufacturing with these capabilities:

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'-0" Maximum length: 90'-0" 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 over-sized loads every day, taking pride in timely delivery and providing Highland Tank's signature service.

Saving Our Environment for Future Generations





Each year, commercial and industrial kitchens generate millions of pounds of grease. If allowed to enter a sewer system, this grease will cool and coagulate on the piping. Solidified grease on pipe interiors restricts flow and causes capacity problems and blockages. These blockages can cause raw sewage to back up and spill out of manholes and onto city streets, properties and into the basements of homes and businesses.

These sanitary sewer overflows are unsightly and unpleasant, present potential health hazards and make clean up difficult. They are also time consuming and costly. In the worstcase scenario, raw sewage can overflow to a storm sewer or directly into streams, rivers, lakes or oceans. These overflows are illegal and constitute a serious environmental, economic and public health threat. The U.S. EPA now requires that municipal sewer authorities implement a pre-treatment program to regulate and control grease discharges to reduce and eliminate sanitary sewer overflows. The new EPA regulations impact most food service establishments that discharge wastewater into a sanitary sewer. These facilities may now be required to install pretreatment systems, like high performance automatic grease removal devices or large volume gravity grease interceptors, in order to comply with their grease discharge requirements.

By reducing the levels of grease discharged into the sewer system, the program ensures the protection of America's multi-billion dollar public investment in our treatment infrastructure and the improvement of our nation's water quality.



Steel: The Material of Choice

Superior Structual Design

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.

Because of its product compatibility, steel is the best choice for your liquid storage needs, including motor fuels, biofuels, heating oils, aviation fuels, lube oils and chemicals.

Specified for Strength

We buy steel according to our own strict guidelines and rigid ASTM specifications. All of our steel is mild carbon and 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 even 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 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 our new steel.

"Green" Building and Buying

Highland Tank is the largest manufacturer of environmentally-friendly steel tank products in the United States.

Why is this important to our customers? Buying "green" is an opportunity to use our resources efficiently, build a better environment and provide cost savings. The EPA has even proposed new federal procurement guidelines for recycled products. As all of our steel tank products are 100% recyclable, Highland Tank will form an integral part of your "green" building and will provide contemporary architects and engineers with a forceful response to our society's sensitive, environmental concerns.





Leadership in Design & Quality

We offer innovative steel fabrication, combined with a variety of specialty coatings, designed to meet your specific needs at a competitive price. Many of our grease removal systems feature patented Highland technology and are constructed of mild carbon or stainless steel, meeting ASTM specifications. Our premium stainless steel interceptors are TIG welded to produce high-precision, pure welds with quality unmatched by our competition.

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All of our interceptors are built according to national plumbing codes and UL, ASME, IAPMO and PDI standards. Highland Tank and Steel Tank Institute specifications are followed to ensure complete internal and external corrosion protection. We can supply a full range of equipment packages, and we excel in custom fabrication for unique situations. Highland Tank can design, engineer and fabricate the oneof-a-kind interceptors necessary for the successful operation of your facility.



Standard Construction

Few names in the field of grease interceptor manufacturing are as widely recognized as Highland Tank. Our products are available in a wide range of sizes and types of construction, with a variety of options for customization.

Material Selection

In today's demanding market, stainless steel and coated carbon steel are the "products of choice" for grease interceptor construction. Engineers who specify the use of steel are assured of consistent quality, design flexibility and greater strength for any type of interceptor construction. Nothing can match steel's durability and longevity.

Our fabrication specialists use the finest materials available including type 304, 304L, 316 and 316L stainless steel or carbon steel that meets ASTM specifications. Beginning with the inspection of raw materials and throughout the manufacturing process, rigorous testing and documentation procedures assure compliance with the most stringent industry standards.

Flawless Fabrication

Highly qualified craftsmen, skilled in carbon steel and stainless steel fabrication, take pride in their work to fabricate an interceptor that is second to none. Steel plates from 10 gauge to 1-1/4 inch thick are rolled to form the rigid shell of the vessel. The plates are formed, fitted and welded creating an impermeable interceptor of superior strength. Lap joints with an overlap provide superior "ribbed" construction.

Steel baffles and bulkheads are added to create multiple compartments for fluid treatment, pump and storage options. Flat-flanged heads are standard, as are continuous exterior welds on all joints.







The "Stainless" Advantage

When hygiene and durability are paramount, there is no alternative to stainless steel. Our interceptors are made from type-304 stainless steel for superior strength, corrosion resistance and fabricable ability. All seams are Tungsten Inert Gas (TIG) welded, giving our skilled craftsmen greater control over the weld, allowing for stronger, higher quality welds than competing procedures. The bright, easily maintained surface of stainless steel provides a modern and attractive appearance.

Additionally, our final steel polishing delivers an ultra-smooth and shimmering finish, regardless of the size or shape of your interceptor.

Factory Testing

Leak integrity tests consisting of a 5-psi factory air test and seam inspections are conducted. Where an air test is impractical, a hydrostatic test is performed.

To help reduce field-commissioning time, all mechanical, electrical and plumbing systems are factory tested for performance to ensure that the highest levels of quality are maintained.

We are committed to excellence in designing and fabricating carbon and stainless steel interceptors that meet the highest standards of performance and quality.



Advanced Corrosion Protection

Performance Coatings

Proper surface preparation is the most important factor in any successful coating or lining. Quality assurance is maintained through Highland's complete in-house grit blast cleaning, finishing and curing facilities.

Our facilities are temperature-controlled for year-round application. Only qualified and experienced personnel, working under stringent guidelines, are used to apply our wide range of spray-applied, high performance formulations, including epoxies and high-build polyurethanes. Exterior coatings and interior linings are selected to meet specific site conditions and service requirements.

Sample List of Exterior Coatings and Interior Linings

- High-solids Polyurethane
- High-solids Epoxy
- Cross-linked Epoxy Phenolic
- Primer Paint

HighGuard

The HighGuard corrosion protection system is Highland's own innovation. This coating 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. A coating of 75 mils of HighGuard will provide permanent and fully effective corrosion protection that can be measured in decades, rather than years.

Steel Tank Institute

Long before the government became concerned with underground storage of hazardous materials, Highland Tank addressed this issue with our quality Steel Tank Institute approved corrosion protection systems. Highland Tank offers several STI approved systems with or without pre-engineered cathodic protection.



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Stainless Steel

Highland Tank manufactures our automatic grease interceptors of 316 or 316L stainless steel. In many cases, stainless steel is used to manufacture gravity grease interceptors due to its resistance to stains and corrosion.

Other advantages include:

- Easy to clean
- Durable
- Long life expectancy

The use of stainless steel insures a high-quality, virtually maintenance-free interceptor. Highland's process and application engineers can assist you in selecting the right combination of features and options needed to meet your individual preferences.



Grease Removal Systems

Innovative Solutions for All Types of Municipal Wastewater Discharge Problems

Highland Tank provides you with the strongest and most reliable grease interceptors in the industry. Our interceptors are designed to remove animal and vegetable-based fats, oil and grease (FOG) from wastewater discharged from FSEs.

Many municipalities have strict sewer discharge limits that govern the amount of FOG and solids that can be discharged by a FSE. Highland Tank is known for grease removal systems that exceed industry standards.

Our extensive line of commercial and specialty grease interceptors are designed to meet your specific needs, as well as to help solve many application-related problems.

Highland Tank's complete line of grease removal systems includes:

GreaseStopper®Automatic Grease Interceptors (AGI)

GreaseStoppers® are grease removal devices (GRD) designed to handle discharges of FOG generated predominately from washing and cleaning operations in restaurants and food preparation facilities. They automatically remove grease from the interceptor with an electrical/ mechanical skimmer.

Passive Grease Interceptors (PGI)

PGIs are gravity-based grease interceptors designed to remove large quantities of FOG generated and discharged by large commercial/ institutional kitchens and food service establishments. They are sized to comply with all national and municipal plumbing codes, including those with 30-minute retention times. The PGI's high-strength but light-weight, impermeable steel shell combines with an acid-resistant liner to provide a flexible, long lasting and top-quality grease interceptor.

Manual Grease Interceptors (MGI)

MGIs are hydromechanical grease interceptors typically installed indoors where they can be hooked up to a sanitary sewer that does not mandate an automatic grease removal device.

Solids Interceptors

Highland fabricates a variety of strainer devices designed to catch solid waste before it enters a grease interceptor or a facility's sewage system.

Common Applications Include:

- Airports
- Casinos
- Convenience Stores
- Convention Centers
- Correction Facilities
- Food Processing Plants
- Grocery Stores & Hypermarkets
- Hospitals & Health Care Facilities
- Hotels & Resorts
- Military Base Mess Halls
- Quick Serve Restaurants & Diners
- Restaurants
- School & University Cafeterias
- Shopping Malls
- Sports Arenas
- Truck Stops & Travel Centers

Highland Tank manufactures to multiple codes based on the requirements of the installation site and authority having jurisdiction (AHJ).



GreaseStopper[®]

Automatic Grease Interceptors

GreaseStopper[®] Automatic Grease Interceptors (AGI) are designed to intercept and remove large quantities of fats, oils and grease (FOG) discharged from FSE and large commercial/ institutional kitchens, which might interfere with the proper drainage and treatment of municipal wastewater.

These high-performance GRD are suitable for aboveground or underground vaulted installations and conform to most municipal sewer pretreatment programs. Point-source units are relatively small, allowing installation in a kitchen under a sink or other limited space. They are typically connected to the drain lines between the pot washing sink, the dishwasher pre-rinse sink and the sewer drain.

Larger volume end-of-pipe units are usually installed in the building's basement and service an entire facility's kitchen fixtures, including all floor drains. Either style incorporates our patented, electrically powered mechanical grease-skimming device.

Proven Performance

- Recovers, removes and recycles nearly 100% of the FOG from restaurant kitchen drains recovered grease can be utilized as a valuable feedstock for Biodiesel production
- Removes oily food solids before blockages occur in pipes
- Removes grease automatically on a preprogrammed, timed basis using digital technology
- Minimizes the daily routine of grease interceptor cleaning a substantial cost savings
- With only one moving part, the GreaseStopper® requires little maintenance
- Equipped with reliable, heavy-duty direct-drive electric motors for long-term use without overheating
- Designed and constructed in accordance with Underwriters' Laboratories, Inc. UL 430 Standard (Control Number 1D42)
- Conforms to PDI G101 and certified to ASME A112.14.3 & 14.4
- IAPMO Research and Testing, Inc. Certificate of Listing (UPC)













How the GreaseStopper® Automatic Grease Interceptor Works

Simply the Best

The GreaseStopper[®] is usually connected to the drain lines of the pot washing sink, the dishwasher pre-rinse sink and the sewer drain - typical sources of FOG in a food service establishment.

As greasy water enters the unit, it flows through the interceptor's screen basket and strikes the inlet baffle; solids are removed, and the velocity head is dissipated. The wastewater enters the grease retention area where the grease separates by gravity flotation and remains between the two baffles.

Thermostatically-controlled electric immersion heaters keep the collected grease in a liquid state in preparation for skimming.

The Diskimmer, an electrically-powered device that operates on a time or event-controlled basis, skims the liquified grease off the wastewater's surface. Grease adheres to the rotating plastic disc until it passes between scraper blades.

The skimmed grease is directed into a steeply-sloped trough and drained through a conduit into a disposal container or barrel and recovered for proper grease recycling. The grease can be converted into Biodiesel, a clean-burning, renewable fuel source.

The effluent flows downward, under the discharge baffle, then to the outlet, where it is discharged to the sewer.

Inspection and cleaning is simple removable vapor-tight top covers enable easy access.

A Reputation for Quality

Recognized as one of the industry's premier grease removal devices, the GreaseStopper[®] has many proven performance advantages. It has greater retention time than competitive automatic units, which equates to better grease separation and interceptor performance. In fact, it recovers almost 100% of the fats, oils and grease and reduces total suspended solids and biological oxygen demand.

The GreaseStopper[®] is more efficient than traditional grease traps because solid materials are removed separately in a dedicated chamber using a screen basket. The remaining volume of the vessel is devoted exclusively to grease interception and separation.

The accumulated grease, common in a traditional grease trap, is not apparent in the GreaseStopper[®] because the system's regular self-cleaning feature prevents grease build-up.

The GreaseStopper[®] operates at its optimum volume at all times, minimizing any sloppy manual maintenance.



disposable container outside AGI tank

The Custom Advantage

Customized for Your Needs

Because we know that every application is unique, Highland Tank designs each GreaseStopper[®] individually, so you never have to adapt your kitchen operations to our products.

Our rugged, heavy gauge stainless steel is available in 14 sizes, as well as larger volumes and custom systems. Our units are available with complete equipment packages that include level sensors, alarm/control panels, pump systems, insulation systems and access stairs and platforms.

Highland Tank has worked closely with pretreatment coordinators, engineers, architects, developers, builders and contractors to ensure that our products meet all our customer needs as well as the latest environmental, building and plumbing regulations.

Our company is committed to building on the strength of our quality GreaseStoppers® by continuing to deliver on our commitment to innovation and by remaining alert and responsive to our consumers' demands. Listings and Approvals City of New York Material and Equipment Acceptance -MEA No. 251-91 E2

Massachusetts State Plumbing Code CMR-248

Approved by the IPC, UPC and state plumbing codes.

GreaseStopper[®] is approved in many states and municipalities across the country. Contact your local Highland representative for assistance with the local Authority Having Jurisdiction (AHJ) regulations.







GreaseStopper[®] AGI Sizing Chart



[†]National plumbing codes require a minimum 2lbs. of grease retention for each gal./min of flow.

Grease holding capacity at breakdown is determined by a minimum 90% efficiency rating in real life applications and installed according to specification. *Inlet can be directed through top or back of unit. Inlet and outlet heights to be specified by end user.

**OAH (Over All Height) will be determined after outlet height is established.

Series "L" unit(s) is or are designed with low height dimensions to fit under commercial sink fixtures. Contact Highland Tank for more information.

Flush-With-Floor GreaseStopper® AGI



Designed for Dependability

The Flush-With-Floor GreaseStopper[®] is recessed with its top flush with the floor in order to intercept kitchen fixtures and floor drains, save valuable above floor space and accommodate existing piping and structural conditions.

This specialized grease removal device features an integral Automatic Grease Interceptor with separate grease storage and dry electrical compartments. No other manufacturer offers anything even similar to the Flush-With-Floor (FWF) GreaseStopper[®].

Ideal for On-Slab Installations

The grease interceptor is equipped with a hinged access cover that opens to reveal the entirety of the unit for easy cleaning and maintenance.

Additionally, internal water-tight covers with quick-release, flush-mounted latches prevent wash water from intruding into the compartments. The covers are constructed of lightweight aluminum deck plate rated for foot traffic and are provided with an anti-slip finish for safety wherever it is installed.

Standard Features

- Constructed of 304 stainless steel for maximum strength and durability
- Hinged non-skid deck plate cover for ease of maintenance
- Extra-heavy leak-proof gaskets
- Locking system to secure the cover to prevent accidental closure of the lid when open
- Automatic grease removal system featuring electrically-powered grease diskimmers
- Integrated flow control device
- Removable solids strainer basket
- Dry electric compartment with internal lid to protect the electronics and power connections
- Grease storage compartment with removable container with high-level alarm
- Integral perimeter channel to allow floor wash-down to drain into the grease interceptor

Options

- Integral grease pump
- Grade to invert extensions
- H-20 grade level covers

Flush-With-Floor AGI Sizing Guide



All plumbing codes state that a "grease interceptor or automatic grease removal device shall be required to receive the drainage from fixtures and equipment including pot sinks, pre-rinse sinks, soup kettles or similar devices, wok stations, floor drains or sinks into which kettles are drained, automatic hood wash units and dishwashers without pre-rinse sinks."

Model FlowRate Gal/Min	l Length	Dimensions Width	Height	Inlet & Outlet Diameter	Inlet & Outlet Height
FWF - AGI - 20	36"	36"	32"	2"	15"
FWF - AGI - 25	36"	36"	32"	3"	15"
FWF - AGI - 30	36"	36"	32"	3"	15"
FWF - AGI - 35	36"	36"	32"	3"	15"
FWF - AGI - 50	40"	36"	36"	4"	18"
FWF - AGI - 75	48"	36"	40"	4"	22"
FWF-AGI - 100	60"	38"	47"	4"	22"

National plumbing codes require a minimum 2 lbs. of grease retention for each gal/min of flow. Grease holding capacity at breakdown is determined by a minimum 90% efficiency rating in real life applications and installed according to specification.

Manual Grease Interceptors



Manual Grease Interceptors (MGI) are hydromechanical grease interceptors designed to intercept and collect large quantities of sewer clogging fats, oil and grease (FOG) and oily food waste discharged from food service establishments' kitchens. They are usually installed indoors and connected to the drain lines of the pot washing sink and the dishwasher pre-rinse sink. MGIs are typically used where they can be connected to a sanitary sewer that does not mandate automatic grease recovery devices.

Operation

The operation of the MGI is simple. They retain wastewater long enough to allow FOG and oily food solids to separate out by gravity flotation and settling. Since grease is lighter than water, the grease floats to the surface of the interceptor. Conversely, solids settle to the bottom and accumulate at the sludge baffle. The accumulating grease can be scooped and disposed of or recycled with other grease by a rendering firm.

Construction

MGIs are constructed of mild carbon steel and coated with heavy-duty polyurethane for superior corrosion resistance. Stainless steel construction is also available. MGIs are available in many configurations to fit almost any requirement.

Large volume MGIs are available for applications where gravity grease interceptors cannot be installed underground due to high water conditions, bedrock, conflicting utilities or prohibitive costs. They are designed to fit into tight interior spaces.

MGIs are available with deck plate covers for pedestrian or vehicle (H-20) traffic and allow for total access to the interceptor for observation, maintenance and cleaning.

Options

- Removable solids interceptor basket
- Grade to invert extensions
- Electronic grease level monitor with controls
- Integral pump chambers
- Thermal insulation

Manual Grease Interceptor Sizing Guide



Model FlowRate Gal/Min*	Static Water Gallons	Grease Holding Capacity Pounds	Length	Dimensions Width	Height	Inlet & Outlet** Diameter	Inlet & Outlet Height	Covers
MGI - 10	10	20	20"	14"	15"	2"	9.50"	1
MGI - 15	14	30	22"	14"	15"	2"	11.50"	1
MGI - 20	17	40	22"	14"	20"	2"	14"	1
MGI - 25	25	50	26"	17"	22"	3"	14"	1
MGI - 35	40	70	29"	22"	24"	3"	16"	1
MGI - 50	47	100	30"	22"	26"	3"	18"	1
MGI - 75	76	150	34"	24"	34"	4"	23.50"	1
MGI - 100	193	200	53"	35"	34"	4"	26"	2
MGI - 125	226	250	56"	36"	36"	4"	28"	2
MGI - 150	304	300	59"	37"	38"	4"	30"	2
MGI - 200	396	400	68"	42"	44"	4"	34"	2
MGI - 250	500	500	73"	44"	48"	4"	38"	3
MGI - 300	580	600	75"	47"	52"	4"	40"	3
†MGI - 350	625	700	78"	50"	52"	6"	40"	3
†MGI - 400	815	800	82"	56"	58"	6"	44"	4
†MGI - 500	865	1,000	90"	60"	58"	6"	40"	4
†MGI - 500-N	506	1,000	86"	34"	58"	6"	43"	4
†MGI - 600	997	1,200	96"	60"	58"	8"	44"	4
†MGI - 750	1,018	1,500	98"	60"	58"	8"	44"	4
†MGI - 750-N	777	1,500	132"	34"	58"	8"	44"	4
†MGI - 1000	1,039	2,000	100"	60"	58"	8"	44"	4
†MGI - 1000-N	971	2,000	150"	34"	58"	8"	44"	4
†MGI - 1250	1,269	2,500	104"	60"	60"	8"	51"	4
†MGI - 1500	1,513	3,000	124"	60"	60"	8"	51"	4
†MGI - 1750	1,757	3,500	144"	60"	60"	8"	51"	4
⁺ MGI - 2000	2,002	4,000	164"	60"	72"	8"	51"	4
†MGI - 2500	2,513	5,000	164"	60"	72"	8"	63"	4
†MGI - 3000	3,003	6,000	196"	60"	72"	8"	63"	5

* Intermittent flow. ** No-Hub, Schedule 40. † 6" and larger – companion flanged connection. Also available with 8" or 10" inlet or outlet. Note: Vent Connections are 2" or 3" NPT, on outlet end of MGI. Series "N" units are designed to pass through a 36" wide door. Check and advise for local code requirements.



Passive Grease Interceptors

Durable & Dependable

Passive Grease Interceptors (PGI) help FSE and food production/processing industries comply with the EPA Sewer Pretreatment Regulations. PGIs are high-performance gravity grease interceptors designed to intercept and remove large quantities of sewer clogging FOG and oily food waste before it is discharged in a municipal wastewater treatment system.

PGI sizing and construction conforms to recognized plumbing codes and meets, or exceeds, most municipal FOG discharge requirements. They can be sized for greater volumes, storage capacity and even retention times up to 30 minutes.

We construct our standard PGIs from mild carbon steel, meeting ASTM specifications, for superior structural strength and impermeability. Unlike old-style concrete or fiberglass interceptors, Highland Tank's PGIs don't crack, leak or collapse under hydrostatic pressure. And unlike many competitive units, they're water tight and pressure testable for leaks in both the factory and the field.

Advanced Corrosion Protection

Factory and Steel Tank Institute specifications are followed to assure complete internal and external corrosion protection. We offer complete interior/exterior grit blast and finish coatings, including Highland Tank's HighGuard UL-1746 approved protective polyurethane coating. An additional acid-resistant internal polyurethane lining assures years of continuous service.

Design Options

Stainless steel construction is a valuable option. Stainless steel is inherently corrosion resistant and has high mechanical properties. In many cases, it is preferred due to its appearance and durability.

Aboveground cylindrical or rectangular interceptors and custom designs are also available so that you can tailor volumes, compartments, inlets, outlets or baffles to satisfy specific code requirements.

Large, outdoor gravity grease interceptors effectively separate FOG and kitchen waste from wastewater. They reduce the risk of sewer clogging and potentially dangerous and damaging sanitary sewer overflows because they provide longer retention time and storage volume.



How Our Passive Grease Interceptor Works



Construction Options

- Stainless Steel Construction
- Double-Wall Secondary Containment
- Stackable Risers and Covers can be modified in the field to allow for easy installation
- Manway Extensions
- Large EZ-Access Manways
- Grade-Level Manways
- Aboveground Cylindrical Design
- Saddles or I-Beam Supports
- Deadmen Anchoring System
- FOGSWatch Monitoring System
- Effluent Filters
- Influent or Effluent Pump Systems

Performance Engineered

These efficient and easy to install gravity grease interceptors are typically located outside a building near the source of the wastewater. They are buried below grade to receive the gravity flow from all grease or solidsreceiving kitchen fixtures and drains.

The interceptor is designed to have much greater hydraulic retention time than competitive units. PGIs also contain advanced influent flow diffusers, "switchback" baffling and effluent transfer baffles designed to reduce flow turbulence, prevent short-circuiting and accelerate the separation process.

Their large capacities, along with their specially designed internal baffles, enable them to retain wastewater long enough for liquefied grease to separate, cool and congeal. The interceptor is divided into multiple chambers where grease coagulates and floats to the surface, accumulating at the grease dams and leaving clearer water beneath as the discharge effluent. Solids either float or sink to the bottom where they are blocked by the sludge baffles.

The inlet of the PGI features Highland Tank's patented Velocity Head Diffusion Baffle. It diverts incoming flow and prevents it from disturbing solids that have settled to the bottom of the tank.

Large cylindrical or rectangular manways with quick-opening covers allow for easy access and maintenance.

Highland Tank recommends monthly maintenance inspections to determine the thickness of the grease and solids layer along with regular cleaning. A certified waste hauler can pump out the grease and oily food waste safely from above. An integral sampling port, or separate sampling box, is located at the outlet end of the interceptor, allowing for easy inspection and sampling needed to confirm performance.

Compare and Choose

- Strong and durable
- Lighter than traditional concrete units, resulting in lower delivery, crane rental and installation costs
- Easier to clean due to the cylindrical design — during pumpout, all the solids and liquids flow to the bottom centerline, right to the suction hose



Cylindrical Passive Grease Interceptor Sizing Guide



Total	Operating	Dimen	Dimensione		
Gallons	Grease volume Gallons / Pounds	Dimer	Lenath	Diameter	
**240	63 4 / 483	3'-2"	4'-0"	4"	
1*300	76.4 / 581	3'-2"	<u> </u>	 	
**350	117 / 889	3'-6"	5'-0"	4"	
+550	137 / 1.041	3'-6"	7'-9"	4"	
†750	190 / 1.444	3'-6"	10'-9"	4"	
†1,000	246 / 1,875	4'-0"	10'-9"	4"	
†1,250	319 / 2,431	4'-0"	13'-9"	4"	
†1,500	403 / 3,065	5'-4"	9'-0"	4"	
†2,000	514 / 3,906	5'-4"	12'-0"	4"	
†2,500	643 / 4,886	5'-4"	15'-0"	4"	
†3,000	771 / 5,861	5'-4"	18'-0"	4"	
†4,000	1,028 / 7,817	5'-4"	24'-0"	4"	
†5,000	1,245 / 9,464	6'-0"	23'-10"	6"	
6,000	1,497 / 11,383	6'-0"	28'-8"	6"	
7,000	1,847 / 14,040	7'-0"	24'-4"	6"	
8,000	2,666 / 20,264	7'-0"	28'-0"	6"	
9,000	2,349 / 17,858	8'-0"	24'-0"	6"	
10,000	2,611 / 19,842	8'-0"	26'-8"	6"	
12,000	3,133 / 23,811	8'-0"	32'-0"	8"	
15,000	5,000 / 37,996	10'-0"	25'-6"	8"	
20,000	5,413 / 41,140	10'-6"	31'-0"	8"	
25,000	6,544 / 49,738	10'-6"	38'-9"	8"	
30,000	7,580 / 57,606	10'-6"	46'-6"	8"	
40,000	10,035 / 76,369	12'-0"	47'-6"	8"	
50,000	12,570 / 95,538	12'-0"	59'-6"	8"	
60,000	15,160 / 115,216	13'-0"	60'-6"	8"	

* Available as single-basin ONLY with one manway, all others have one manway per basin. †IAPMO UPC Approved. Gravity Grease Interceptor (GGI) sizing and construction is consistent with industry protocol for complying with the sewer pre-treatment regulations. GGI sizing is based on 30-minute retention time. Consult Highland Tank for alternate sizing methods. Approved by the IPC, UPC and state plumbing codes. Contact your local Highland Tank representative for assistance with the local Authority Having Jurisdiction (AHJ) regulations.

Standard Features

- Rugged protected steel construction for superior structural strength
- Factory welded inlet, outlet, transfer pipes and baffles
- Exterior polyurethane coating provides corrosion protection
- Acid-resistant internal polyurethane lining to protect against hydrogen sulfide damage
- Light color interior coating for ease of inspection
- Smooth, interior lining makes pump-outs and cleaning easier
- Factory-mounted on structural steel skid for bolting to pad
- Hinged vapor-sealed covers for easy access, inspection and maintenance
- Factory-tested for tightness

Pre-Engineered Design Options

Single-basin interceptors have a single collection chamber and a sludge baffle to remove FOG and solids. This is our simple grease and garbage "knock-out" design.



A Simple"Knock-Out" Interceptor

Double-basin interceptors have two collection chambers and a sludge baffle. Our most popular design conforms to IAPMO/ANSI Z1001-2007.



Meets UPC requirements for Gravity Grease Interceptors

Triple-basin interceptors have three collection chambers and a sludge baffle. FOG and solids are trapped in the first compartment and any remaining grease is trapped in the second compartment. The third chamber can be modified and equipped with an effluent pump system when gravity flow to the sewer is not an option.

PGIs are approved in many states and municipalities. Custom designs are available to meet AHJ requirements. Consult a local Highland Tank representative for more information.



Approved - Washington Suburban Sanitary Commission (WSSC)

Rectangular Passive Grease Interceptors

The Aboveground Alternative



Rectangular Passive Grease Interceptors (R-PGI) can be installed aboveground to help FSE intercept and accumulate FOG on-site and prevent it from entering the POTW collection system.

Like our cylindrical, underground units, the R-PGI's large capacity and specially designed internal baffles, retain wastewater long enough in a nonturbulent environment for proper grease and solids separation.

Their large volume can accommodate retention times of 30 minutes or greater.

Additionally, they can receive discharge from kitchen fixtures, garbage grinders and all other food preparation areas, therefore eliminating the need for a solids interceptor. R-PGI are available in single, double or triple basin configurations.

Their design and construction is superior to old style concrete grease interceptors. They are lighter than concrete and constructed as a one-piece unit, which is easier to install and maintain.

Standard Features

- Rugged protected steel construction for superior structural strength
- Factory welded inlet, outlet, transfer pipes and baffles
- Exterior polyurethane coating provides corrosion protection
- No-slip finish on tank top
- Acid-resistant internal polyurethane lining to protect against hydrogen sulfide damage
- Light color interior coating for ease of inspection
- Smooth, interior lining makes pump-outs and cleaning easier
- Factory-mounted on structural steel skid for bolting to pad
- Hinged, vapor-sealed covers for easy access, inspection and maintenance

Rectangular Passive Grease Interceptor Sizing Guide

Rectangular Double Basin Level Sensor Port Vent Fitting Manway INLET OUTLET Indirect Effluent Grease Dam Flow Transfer Baffle Influent Flow Height Diffusion Baffle Striker Plate Sludge Baffle Interior Lining Width Length

 Options Custom sizing and configurations available per AHJ requirements 	Total Volume Gallons	Operating Grease Volume Gallons/Pounds	Length	Dimensions Width	Height	Inlet & Outlet Diameter
Stainless steel construction	*†500	182/1,388	5'-8"	4'-0"	4'-0"	4"
 Double-wall construction 	†750	249/1,895	8'-4"	4'-0"	4'-0"	4"
 OSHA Ships Ladder or Stairs 	†1,000	329/2,500	11'-0"	4'-0"	4'-0"	4"
Manway Extensions	†1,250	415/3,154	8'-6"	5'-0"	5'-0"	4"
Platforms	†1,500	499/3,789	10'-0"	5'-0"	5'-0"	4"
 Thermal Insulation 	†2,000	665/5,053	13'-4"	5'-0"	5'-0"	4"
 Immersion Heaters 	†2,500	835/6,348	16'-9"	5'-0"	5'-0"	4"
 OSHA Handrail around top of tank 	†3,000	1,002/7,617	16'-9"	6'-0"	5'-0"	4"
 Easily accessible Sampling Ports 	†4,000	1,332/10,120	22'-3"	6'-0"	5'-0"	4"
for grease interceptor monitoring	†5,000	1,670/12,691	23'-6"	6'-0"	6'-0"	6"
 FOGSWatch Monitoring System 	6,000	2,003/15,226	24'-2"	7'-0"	6'-0"	6"
Effluent Filters	7,000	2,333/17,732	23'-3"	7'-0"	7'-0"	6"
 Influent or Effluent Pump Systems 	8,000	2,666/20,265	23'-3"	8'-0"	7'-0"	6"
Custom designs are sucilable to	9,000	3,007/22,853	22'-4"	8'-0"	8'-0"	6"
Custom designs are available to	10,000	3,332/25,325	24'-9"	8'-0"	8'-0"	6"
meet And requirements.	12,000	4,041/30,714	23'-9"	9'-0"	9'-0"	8"
	15,000	5,062/38,475	29'-9"	9'-0"	9'-0"	8"
	20,000	6,744/51,252	35'-8"	10'-0"	9'-0"	8"
	25,000	8,417/63,973	39'-4"	10'-0"	10'-0"	8"
	30.000	10.093/76.714	47'-2"	10'-0"	10'-0"	8"

*Available as double-basin ONLY. † Complies to IAPMO UPC

Gravity Grease Interceptor (GGI) sizing and construction is consistent with industry protocol for complying with the sewer pre-treatment regulations. GGI sizing is based on 30-minute retention time. Consult Highland Tank for alternate sizing methods. Inlet diameter/flow must not exceed that of the outlet. Improper pumping of wastewater into the PGI can result in increased turbulence and less efficient separation; consult Highland Tank for influent pumping system selection.

Lift Stations

Ideally, wastewater collection system operation relies on gravity to keep the wastewater flowing downward from its origin to destination. Plumbing engineers design grease removal systems to rely on the natural forces of gravity to move the wastewater over the changing grades downstream.

If gravity is not available, lift stations equipped with pumps are employed to move the water to its discharge point or to another lift station.

Highland Tank offers a full line of pre-packaged lift stations engineered for easy installation, efficient operation and ease of maintenance.

Lift stations are comprised of the sump, pumps, level sensors and controls. Highland Tank fabricates aboveground and underground stainless steel or protected carbon steel sumps. Our heavy-duty carbon steel sumps are designed for the rigors of underground environment.

Features

- HighGuard exterior corrosion control system
- Rugged interior epoxy liner protects the sump against hydrogen sulfide
- Diameters from 36" to 144"
- Depths from 3'-0" to 18'-0"
- Individually designed with submersible pumps on a rail system for easy maintenance
- Single and multi-pump systems
- Custom-designed controls for automatic operation, design flexibility and expandability

Options

- Pressure transducers
- Ultra-sonic level sensors
- Stainless steel or fiberglass NEMA enclosures
- · Steel reinforcing, anchoring rings
- Double-wall construction
- Electronic leak detection
- Valve boxes
- Lightweight pneumatic assist hinged access doors







Sample Ports

Efficient maintenance and operation of many wastewater treatment systems require sampling outflow for FOG concentration. Highland Tank offers interceptor-mounted, in-line and free-standing sampling ports to enable pretreatment inspectors to collect representative sample of the wastewater being discharged to the sanitary system.







Solids Interceptors

Simple & Effective Solids Removal



Flat Strainer Baskets

Flat Strainer Baskets (FSB) are designed to reduce the amount of coarse and fine solids discharged from a FSE. FSB can be used for both kitchen retrofits and new construction. They are usually installed under the dishwasher pre-rinse sink where dirty dishes are pre-rinsed. Our flexible design allows for connection to any sinks with over 4" of height adjustment.

The removable strainer tray dewaters solids for easy disposal as garbage or compost. The unit has a see-through plexiglas cover for easy maintenance. Left or right outlet ports and stainless steel legs with adjustable foot pegs for leveling make installation easy. FSB are available in two popular sizes and can be customized to meet your specific needs.

In-Line Strainer Baskets

In-Line Strainer Baskets (ISB) are relatively small for installation under a pot or dishwasher pre-rinse sinks. ISB are available in many standard sizes to be used in conjunction with our automatic and manual grease interceptors as a reliable pre-treatment device. In-Line Strainer Baskets are required by many sewer authorities and are mandated by the Washington Suburban Sanitary Commission (WSSC) where grease interceptors are installed.

Advantages

- Removes nearly 100% of the solid food waste from FSE drains
- Constructed of durable stainless steel and other corrosion resistant materials
- Easily accessible for maintenance and cleaning
- Saves money on water & electricity
- Eliminates costs of cleaning pipes and/or holding tanks
- Helps keep the grease interceptor clean and minimizes pumpout frequency
- Available in many standard sizes custom manufacturing to meet your needs is also available



Solids Interceptors Sizing Guide



Model Capacity	Length	Dimensions Width	Height
FSB-1	18"	20"	17.25"
FSB-2	12"	16"	17.25"



Model Capacity	Length	Dimensions Width	Height	Inlet/Outlet Diameter	Inlet/Outlet Height
ISB - 15	9"	12"	15.5"	2"	9"
ISB - 20	9"	16"	18"	2"	9"
ISB - 25	9"	16"	18"	3"	9"
ISB - 25 L	9"	22"	18"	2"	6"
ISB - 30	11"	17"	19"	3"	10"
ISB - 35	14"	18"	26"	3"	17"
ISB - 50	14"	18"	32"	4"	18"
ISB - 75	15"	18"	36"	4"	22"
ISB - 100	16"	20"	36"	4"	22"

In-Line Strainer Basket

Coarse Solids Strainer



Coarse Solids Strainer

The Coarse Solids Strainer (CSS) is a convenient solid-liquid strainer that removes a large percentage of oily food waste from FSEs' wastewater and produces a solids fraction with low moisture content.

Simplicity of design and efficient debris handling makes the Coarse Solids Strainer the ideal solution for cost efficient solids removal from a FSE's wastewater. Our engineers customize each CSS to site-specific applications and parameters. Retrofit into existing installations is simple and there is usually no need for expensive plumbing modifications.

Operation

The CSS has no moving parts and no power requirements, so operation is simple. The primary separation device is stationary screen, mounted on a positive incline. The raw liquid slurry enters the inlet, drains onto the top edge of the diffuser and is allowed to flow over the heavy-duty screen. Liquids pass through the screen while solids move down the face of the screen and accumulate at the bottom screen basket for disposal.

The wastewater drains to a properly sized GreaseStopper[®] Automatic Grease Interceptor for FOG removal before final discharge.

Advantages

- Simple and robust design
- Minimal maintenance required
- Proven reliable performance
- No debris bypassing or carryover to clean side
- Significant weight and volume reduction
- High moisture reduction
- · Easy cleaning and maintenance

Custom and Packaged Grease Removal Systems

Exceptional Quality, Cost and Delivery



Experience and Integrity

Highland Tank offers a unique scope of service in the fabrication of all our grease removal systems. Our systems can be supplied on a turnkey basis utilizing our experienced management and engineering teams, guaranteeing on-time delivery for your fast track projects.

Our grease removal systems can be engineered specifically for the application. We offer better quality control, single source responsibility and other costeffective advantages. Components can be matched to the job requirements, budget and the technical abilities of the staff.

Reliability

Startup requires only a few days with one or two people; since very few pieces are fitted on site. From delivery of the finished product, start-up and operator instruction, to technical and service help throughout the warranty period, you deal with one company – Highland Tank and our specialized support staff.

Give us a call to discuss your project, and we'll be happy to help with both custom and packaged grease removal systems installations. We can provide you with cost-effective and time-saving solutions that will deliver outstanding performance and long service life with reduced maintenance cost.

Advantages

We provide high-quality, superiorperformance, cost-effective grease and solids removal systems, storage vessels and system accessories engineered and manufactured to solve your most challenging applications.

Systems can be designed to meet nearly any set of challenges that would be difficult, if not impossible, to address if the system were built on-site.

Design, construction and testing are monitored in a controlled environment where problems can be addressed well before installation and startup and the construction process is not hindered by inclement weather or other on-site delays.

Accessories



















Customized To Meet Your Specific Needs

Highland Tank's accessory line is designed to augment our wide selection of grease removal systems, making it easy to quickly and efficiently turn any of our interceptors into a complete operating system. From level sensors and control panels to anchoring systems and grade level manways, Highland Tank is equipped to take your next project from concept to reality. Here are some of our quality accessories:

1. Deadmen Anchor System

Designed to secure interceptors at installations where there is potential for high water. They are used with our standard underground Passive Grease Interceptors from 550 to 60,000 gallons. Deadmen Anchors are used exclusivley with Highland's Polyester Hold-Down Straps and supplied hardware. (See pp. 46-47 for details)

2. FOGSWatch

A level monitoring system designed to continuously monitor the accumulation of Fats, Oils, Grease and Solids within the first chamber of a grease interceptor.

3. Grade Level Manways (GLM)

Designed to AASHTO H20 requirements. Each manway is constructed of A36 steel plate from 10 ga. to .25" thick, with lids of .38" reinforced checkered steel plate. Round GLMs are available in sizes ranging from 12" to 48" diameter. (See p. 55 for details)

4. Ladders, Stairs, Platforms and Walkways

Designed to comply with strict OSHA specifications. Mounting brackets and other structural accommodations can be factory-fitted to facilitate field installation. (See p. 53 for details)

5. Interceptor Support Systems

These systems are designed to support the interceptor, keep it stationary and elevate it to minimize corrosion concerns and allow for easy visual inspection. Tank Support Systems are available in two different designs to accommodate specific installation requirements: UL Saddles and Structural Steel Skids. (See pp. 50-51 for details)

6. Complete Pump Package Systems

A wide variety of level sensors can be supplied along with complete influent, effluent and FOG pump package systems.

7. Stackable Risers

Manway extensions for PGI that are sectionalized for ease of installation, especially when specific burial depths may not be known. Our lightweight risers hold their shape, are stackable, screw together and are water and airtight. Each riser comes with a bright yellow, heavy-duty Safety Screen that prevents entry into the interceptor if the riser cover is unknowingly removed. (See p. 54 for details)

8. Grease Totes and Hoppers

Heavy-duty steel containers for the storage of waste grease. We offer different sizes and configurations to fit your application needs.

9. Alarm and Control Panels

A comprehensive panel selection for level alarm, valve actuation, heating or pump control.

Deadmen Anchoring System

Highland Tank's Deadmen Anchoring Systems are designed to secure interceptors at installations. Polyester or steel hold-down straps and concrete beams are used to achor the PGI and counteract its 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 13'-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 60,000 gallons
- Utilizes 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 100-011).

Tank Volume Interceptor Dimensions		Required	Required	
Gallons	Diameter	Length	Deadmen	Straps
240	3'-2"	4'-0"	2	2
300	3'-2"	5'-0"	2	2
350	3'-2"	5'-5"	2	2
550	3'-6"	7'-9"	2	2
750	3'-6"	10'-9"	2	2
1,000	4'-0"	10'-9"	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
5,000	6'-0"	23'-10"	4	4
6,000	6'-0"	28'-8"	6	6
7,000	7'-0"	24'-4"	2	2
8,000	7'-0"	28'-0"	4	4
*9,000	8'-0"	14'-0"	2	2
*10,000	8'-0"	26'-8"	6	6
*12,000	8'-0"	32'-0"	6	6
*15,000	10'-0"	25'-6"	4	4
*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





Steel 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, 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 is 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.



* Contractor supplied items

Steel Hold-Down Straps Sizing Guide

Tank		Hold-Down Strap		
Intercepto Dia.	<u>r Dimensions</u> Length	Required Quantity	Size WxT	
3'-2"	4'-0"	2	2" x .25"	
3'-2"	5'-0"	2	2" x .25"	
3'-2"	5'-0"	2	2" x .25"	
3'-6"	7'-9"	2	3" x .25"	
3'-6"	10'-9"	2	3" x .25"	
4'-0"	10'-9"	2	3" x .25"	
5'-4"	9'-0"	2	3" x .25"	
5'-4"	12'-0"	2	3" x .25"	
5'-4"	15'-0"	2	3" x .25"	
5'-4"	18'-0"	2	3" x .25"	
5'-4"	24'-0"	2	3" x .25"	
6'-0"	23'-10"	2	3" x .375"	
6'-0"	28'-8"	2	3" x .375"	
7'-0"	24'-4"	2	3" x .375"	
7'-0"	28'-0"	3	3" x .375"	
8'-0"	14'-0"	2	4" x .50"	
8'-0"	26'-8"	4	3" x .375"	
8'-0"	32'-0"	4	3" x .375"	
10'-0"	25'-6"	3	4" x .50"	
10'-6"	31'-0"	4	4" x .50"	
10'-6"	38'-9"	5	4" x .50"	
10'-6"	46'-6"	6	4" x .50"	
12'-0"	47'-6"	8	4" x .50"	
12'-0"	59'-6"	10	4" x .50"	
13'-0"	60'-6"	12	4" x .50"	
	Interceptor Dia. 3'-2" 3'-2" 3'-2" 3'-6" 3'-6" 3'-6" 5'-4" 5'-4" 5'-4" 5'-4" 6'-0" 6'-0" 7'-0" 8'-0" 8'-0" 10'-6" 10'-6" 10'-6" 12'-0" 12'-0" 13'-0"	Interceptor DimensionsDia.Length $3'-2"$ $4'-0"$ $3'-2"$ $5'-0"$ $3'-2"$ $5'-0"$ $3'-6"$ $7'-9"$ $3'-6"$ $10'-9"$ $4'-0"$ $10'-9"$ $4'-0"$ $10'-9"$ $5'-4"$ $9'-0"$ $5'-4"$ $12'-0"$ $5'-4"$ $12'-0"$ $5'-4"$ $24'-0"$ $6'-0"$ $23'-10"$ $6'-0"$ $28'-8"$ $7'-0"$ $24'-4"$ $7'-0"$ $28'-0"$ $8'-0"$ $14'-0"$ $8'-0"$ $32'-0"$ $10'-6"$ $31'-0"$ $10'-6"$ $31'-0"$ $10'-6"$ $38'-9"$ $10'-6"$ $46'-6"$ $12'-0"$ $47'-6"$ $12'-0"$ $59'-6"$ $13'-0"$ $60'-6"$	$\begin{tabular}{ c c c c c } \hline Hold-Dow \\ \hline Required \\ \hline Quantity \\ \hline 3'-2" & 4'-0" & 2 \\ \hline 3'-2" & 5'-0" & 2 \\ \hline 3'-2" & 5'-0" & 2 \\ \hline 3'-2" & 5'-0" & 2 \\ \hline 3'-6" & 7'-9" & 2 \\ \hline 3'-6" & 10'-9" & 2 \\ \hline 5'-4" & 9'-0" & 2 \\ \hline 5'-4" & 9'-0" & 2 \\ \hline 5'-4" & 12'-0" & 2 \\ \hline 5'-4" & 15'-0" & 2 \\ \hline 5'-4" & 18'-0" & 2 \\ \hline 5'-4" & 18'-0" & 2 \\ \hline 5'-4" & 24'-0" & 2 \\ \hline 5'-4" & 24'-0" & 2 \\ \hline 5'-4" & 24'-0" & 2 \\ \hline 6'-0" & 28'-8" & 2 \\ \hline 7'-0" & 28'-8" & 2 \\ \hline 7'-0" & 28'-8" & 2 \\ \hline 7'-0" & 28'-8" & 4 \\ \hline 8'-0" & 32'-0" & 4 \\ \hline 10'-6" & 32'-0" & 4 \\ \hline 10'-6" & 38'-9" & 5 \\ \hline 10'-6" & 46'-6" & 6 \\ \hline 12'-0" & 47'-6" & 8 \\ \hline 12'-0" & 59'-6" & 10 \\ \hline 13'-0" & 60'-6" & 12 \\ \hline \end{tabular}$	

Notes:

- 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 interceptor 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 Support Systems

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 1.125" 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 tank.

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 offers easy installation and service. Additionally, the tank saddles can be anchored to concrete pad to help protect the tank from movement or flotation.







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

	Base Plate Dimensions		Bolt Hole	Locations
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"	17.50"	2"
8'-0"	87"	10"	28.50"	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"

Tank Saddles



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 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. Saddles allow for visual inspection of the entire interceptor.

Highland Tank

Insulation Systems

Highland Tank fabricates and insulates steel tanks for a wide variety of applications. Thermal insulation is applied to tanks to help reduce energy costs associated with heating or maintaining heat in products like heavy fuel oil, resins and asphalt binders.

We have multiple methods for insulating tanks 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
- 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. Finish painted carbon steel fabrication 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 to a support pad are also included.





Horizontal Tank - Internal Ladder



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.



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

Field Adjustable Manways and Manway Extensions

Manways are manufactured and protected against corrosion using the same methods and quality control procedures as the 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 with 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. The length of the manway extensions can vary and are made to order.

Field Adjustable Manways

24" diameter, 38" high with lid, safety screen and access ports. Multiple size sections can easily be adapted in the field to meet site needs.



2-6" and 2-12" Riser Sections are provided and can be arranged in the field to adjust for site elevations

Diam	neter	Thickness	Thickness Bolt I		Bolt
ID	OD	Manway/Lid	Size	Bolts	Circle
18"	24"	.25"25"	.50"	18	21"
20"	26"	.25"375"	.50"	24	23"
24"	30"	.25"375"	.50"	24	27"
30"	36"	.375"375"	.50"	42	34"
36"	42"	.375"375"	.50"	42	40"
42"	48"	.375"375"	.50"	52	45"
48"	54"	.375"375"	.50"	60	51"

Grade Level Manways

Grade Level Manways (GLM) are designed to AASHTO H20 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 .25" 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 .38" reinforced checkered steel plate. Optional .38" 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 Design

Model Number	۸ Skirt I.D. Inches	Iominal Diamete Collar I.D. Inches	r Lid O.D. Inches	Skirt Thickness
GLM-12	12"	14.50"	14"	10ga
GLM-18	18"	20.50"	20"	7ga
GLM-24	24"	26.50"	26"	7ga
GLM-30	30"	32.50"	32"	7ga
GLM-32	32"	34.50"	34"	7ga
GLM-36	36"	38.50"	38"	7ga
GLM-42	42"	44.50"	44"	.25"
GLM-48	48"	50.50"	50"	.25"

Rectangular Design

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"



Proud Commitment to You

Highland Tank is committed to building successful, long-standing relationships with our customers. We are dedicated to providing tanks 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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