

SHORT FORM SPECIFICATION

The contractor shall provide the appropriate single, double or triple-wall fiberglass storage tank and accessories as indicated on tank drawings. Capacity, dimensions and fitting locations will be indicated on tank drawings. Tanks shall be manufactured by Containment Solutions, Inc. The tank must be tested and installed according to manufacturer's current installation instructions.

LONG FORM SPECIFICATION**1. GENERAL**

- 1.1. Related Work Specified in Other Sections of CSI standard (Not included in this package).
 - 1.1.1. Cast-in-Place Concrete: Section 03300
 - 1.1.2. Anchor Bolts: Section 05501
 - 1.1.3. Plastic Pipe: Section 15064
 - 1.1.4. Liquid Level Gauges: Section 15174
- 1.2. Quality Assurance
 - 1.2.1. Acceptable Manufacturers:
Containment Solutions, Inc., Conroe, Texas
- 1.3. Governing Standards, as applicable:
 - 1.3.1. Underwriters Laboratories Inc. standard 1316, Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures.
 - 1.3.2. Underwriters Laboratories of Canada standard ULC-S615, Reinforced Plastic Underground Tanks for Flammable & Combustible Liquids.
 - 1.3.3. National Fire Protection Association codes and standards:
 - NFPA 30 Flammable and Combustible Liquids Code
 - NFPA 30A Motor Fuel Dispensing Facilities and Repair Garages Code
 - NFPA 31 Installation of Oil-Burning Equipment Standard
 - 1.3.4. General Services Administration, Public Building Service Guide Specification PBS: 1568.
 - 1.3.5. City of New York Department of Buildings M.E.A., 71-85-M
 - 1.3.6. American Concrete Institute standard ACI 318, Building Code Requirements for Structural Concrete.
- 1.4. Submittals
 - 1.4.1. Shop Drawings: Contractors shall submit ___ copies of shop drawings for each tank. Drawings shall include all critical dimensions and show locations of all the HydroGuard® System fittings and accessories, i.e., 4" NPT couplings, containment collar, tank sumps, manways, and hold-down straps. Materials of construction shall be in accordance with Section 1.02 of this specification.
 - 1.4.2. Catalog Data: Contractor shall submit ___ copies of manufacturer's literature.
 - 1.4.3. Certification Plate: U.L. labels for petroleum products, alcohols, and alcohol-gasoline mixtures shall be affixed to each tank.
 - 1.4.4. Installation Instructions: Contractors shall submit ___ copies of manufacturer's latest installation instructions.
 - 1.4.5. Calibration Charts: Contractors shall submit ___ copies of manufacturer's latest calibration charts for each tank capacity and diameter specified.

2. PRODUCTS

- 2.1. The HydroGuard System
 - Double-Wall Fiberglass Underground Storage Tanks
 - 2.1.1. Loading Conditions - Tanks shall meet the following design criteria:
 - 2.1.1.1. External hydrostatic pressure: Buried in ground with 7' of over burden over the top of the tank, the excavation fully flooded and a safety factor of 5:1 against general buckling.
 - 2.1.1.2. Surface Loads: When installed according to manufacturer's current installation instructions, tanks shall withstand surface HS-20 axle loads (32,000 lbs/axle).
 - 2.1.1.3. Internal Load: Primary and secondary tanks shall withstand 5 psig (35 kPa) air pressure test with 5:1 safety factor.
 - 2.1.1.4. Tanks shall be designed to support accessory equipment such as heating coils, ladders, drop tubes, etc. when installed according to manufacturer's recommendations and limitations.
 - 2.1.2. Product-Storage Requirements
 - 2.1.2.1. All primary tanks must be vented. Tanks are designed for operation at atmospheric pressure only, except for use with vapor recovery systems at a pressure or vacuum not to exceed 1 psig (7 kPa).

2.1.2.2. Tanks shall be capable of storing liquids with specific gravity up to 1.1.

2.1.2.3. Tank shall be capable of storing the following products:

- Diesel fuel oils for oil burning equipment at temperatures not to exceed 150°F.
- Gasoline, jet fuel, aviation gasoline, motor oil (new or used), kerosene, diesel motor fuel at ambient temperatures.
- Alcohol-gasoline blend motor fuels at ambient temperatures:
 - Gasoline-ethanol blends with up to 100% ethanol.
 - Gasoline-methanol blends with up to 100% methanol.
- Oxygenated motor fuels at ambient temperatures with up to 20% (by volume) methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), di-isopropyl ether (DIPE), tertiary butyl alcohol (TBA), tertiary amyl methyl ether (TAME), or tertiary amyl ethyl ether (TAE).
- Biodiesel-diesel blends with up to 100% biodiesel (B100 per ASTM) at ambient temperatures.

2.1.2.4. The tank, containment collar and tank sump shall be warranted for 30 years against failure due to internal/external corrosion and against structural failure when properly installed.

2.1.3. Materials

2.1.3.1. The tank shall be manufactured as a matrix of premium resin, glass fibers and silane-treated silica that together result in a composite providing improved corrosion protection.

2.1.3.2. Tank inner wall shall be fabricated against a mold to produce a non-air inhibited and high gloss laminate to provide fully cured inner surface without the need of wax coats, a low coefficient of friction and a natural resistance to the build-up of algae or other contamination on the surface. Wax and wax resin coatings cannot be used to achieve full surface cure on tank shells and endcaps.

2.1.4. Dimensional Requirements (refer to Containment Solutions literature)

2.1.4.1. Nominal capacity of the tank shall be ____ gallons / liters.

2.1.4.2. Nominal outside diameter of the tank shall be ____ feet.

2.1.4.3. Nominal overall length of the tank shall be ____ feet.

2.1.5. Monitoring Capabilities

2.1.5.1. Tanks shall have a monitoring space between the walls to allow for the free flow and containment of leaked product from the primary tank. The monitoring space shall provide equal communication in all directions.

2.1.5.2. The following continuous monitoring conditions shall be compatible with the cavity between the inner and outer tanks:

- Vented to atmosphere
- Vacuum – 5 psig maximum
- Positive air pressure (5 psig maximum)
- External hydrostatic pressure – 7' maximum groundwater head pressure over tank top

2.1.5.3. Tanks 6' diameter and larger shall have an integrally mounted annular space reservoir installed on the tank for factory-installed brine and continuous hydrostatic monitoring. The reservoir shall be constructed of fiberglass reinforced plastic materials and be included in the tank warranty.

2.1.5.4. The monitoring fitting for the monitoring space shall be a 4" NPT fitting.

2.1.5.5. The monitoring system shall be capable of detecting a breach in the inner and outer tank under the following installed conditions:

- When the primary tank is empty.
- When the primary tank is partially or completely full and the ground water table is below tank bottom.
- When the primary tank is partially or completely full and the tank is partially or completely submerged in groundwater.

2.1.5.6. The leak detection performance of the monitoring system shall be tested and verified by a qualified independent consultant to detect leaks in the primary or secondary tank walls as small as 0.10 gallons per hour within one-month.

2.1.5.7. The hydrostatic monitoring system shall be capable of a precision tank test that is listed by the National Work Group on Leak Detection Evaluations (NWGLDE) and be listed as a continuous interstitial monitoring method (liquid filled) by NWGLDE.

2.1.5.8. Monitoring fluid solution used in the monitoring space shall be compatible with the tank and be of a contrasting color to the tank.

2.1.5.9. The tank laminate shall be U.L. listed for compatibility with the monitoring fluid.

2.1.6. UL Certification Plate:

2.1.6.1. Underwriters Laboratory label shall be permanently affixed to tank.

2.2. Accessories

2.2.1. Flanged Manways

- 2.2.1.1. The standard manway is 22" I.D. and will be furnished with UL listed gaskets and covers (30" and 36" manways are optional).
- 2.2.1.2. Location – see standard tank drawings.
- 2.2.1.3. Optional manway extensions shall be fiberglass and ____ feet long.

2.2.2. Secondary Containment Collar

- 2.2.2.1. Shall be factory installed.
- 2.2.2.2. The collar shall be fiberglass reinforced plastic, 42", 48" or 54" in diameter and shall be factory-installed in accordance with drawings.
- 2.2.2.3. The collar shall include an internal adhesive channel.
- 2.2.2.4. The collar shall be included in the 30-year tank warranty.

2.2.3. Double-Wall Fiberglass Polygon Tank Sump

- 2.2.3.1. Tank sumps & collars shall be compatible with petroleum fuels and all blends of alcohol (same as tank).
- 2.2.3.2. Tank sump components shall be constructed of fiberglass reinforced plastic. The tank sump shall be 42", 48" or 54" in diameter and must mount to the secondary containment collar. Standard tank sump shall consist of polygon shaped base (round base is optional), round body extension and enclosure top.
- 2.2.3.3. The polygon base shall be 24" in height and provide 19" high panels for piping entry points. The base must be capable of joining to the collar with an internal adhesive channel.
- 2.2.3.4. A 34" or 40" O.D. watertight lid shall be provided at the submersible and fill/vapor end of the tank and provide a watertight seal to the sump enclosure with 12" of water above the lid and remain leak free.
- 2.2.3.5. Refer to tank sump drawings for standard models and configurations.

2.2.4. Adhesive Kit (Kit AD)

- 2.2.4.1. Adhesive kit shall provide a watertight seal at the tank sump and containment collar joint to prevent the ingress of water or egress of fuel. The adhesive kit includes resin, catalyst, mixing stick, putty knife, sandpaper, grout bag, and installation instructions.

2.2.5. Monitoring Capabilities:

- 2.2.5.1. The annular space of the tank sump shall include a standoff material that allows for the unobstructed flow of brine solution on 100% of the surface area.
- 2.2.5.2. The following continuous monitoring conditions shall be compatible with the cavity between the inner and outer walls:
 - Vented to atmosphere
 - External hydrostatic pressure -- 7 ft. maximum groundwater head pressure over tank top.
- 2.2.5.3. Tank Sumps shall have an integrally mounted reservoir installed for continuous hydrostatic monitoring. The reservoir shall be constructed of FRP and be included in the tank warranty. The reservoir shall have an access opening to position the electronic float sensor.
- 2.2.5.4. The monitor shall be capable of detecting a breach in the inner and/or outer tank sump wall when the sump fluid level or groundwater level is lower than the reservoir sensor.
- 2.2.5.5. The leak detection performance of the monitoring system shall be tested and verified by a qualified independent consultant to detect leaks in the primary or secondary tank as small as 0.10 gallons per hour within a one month period.
- 2.2.5.6. Monitoring fluid solution used in the monitoring space shall be compatible with the tank sump and be of a contrasting color to the tank sump.

2.2.6. Fill Tubes

- 2.2.6.1. Fill tubes of appropriate design shall be supplied by contractor.

2.2.7. Hydrostatic Monitor Accessories

- 2.2.7.1. Monitoring fluid shall be a calcium chloride brine or propylene glycol solution.
- 2.2.7.2. Double float reservoir sensor supplied by contractor shall be designed for CSI reservoirs. The components of the sensor shall be compatible with brine and provide two alarm points positioned 10" apart.

2.2.8. Ladders

- 2.2.8.1. Ladders shall be supplied by the tank manufacturer (carbon steel, stainless steel, aluminum).

2.2.9. Anchor Straps

- 2.2.9.1. Straps shall be supplied by the tank manufacturer.
- 2.2.9.2. Number and location of straps shall be as specified by manufacturer.
- 2.2.9.3. Each strap shall be capable of withstanding a maximum load of 25,000 lbs.

2.2.10. Prefabricated Concrete Deadmen Anchors

2.2.10.1. Design Conditions – Deadmen shall meet the following design criteria:

- Deadman shall be designed to ACI 318
- Manufactured with 4,000 psig concrete
- Manufactured in various lengths
- Provide adjustable anchor points for hold down straps

2.2.11. Liquid Sensor Drawstring

2.2.11.1. Galvanized steel drawstring shall be factory installed at the monitoring fitting to facilitate field insertion of sensor.

2.2.12. Fittings Threaded NPT

2.2.12.1. All threaded fittings shall be located on a manway cover or within 12" of the tank top center line. Fittings to be supplied with temporary thread protectors or threaded plugs.

2.2.12.2. All standard fittings shall be 4" diameter NPT half couplings.

2.2.12.3. Internal piping shall be terminated at least 4" from the tank bottom (6" for 12' diameter tanks).

3. EXECUTION

3.1. Installation and Testing

3.1.1. Fiberglass underground tanks must be tested and installed according to the current installation instructions provided with the tank (refer to Containment Solutions Pub. No. INST 6001 for tanks and INST 6034 for double-wall tank sumps). Tanks are installed with pea gravel or crushed stone as specified in current installation instructions.

3.1.2. The installing contractor must complete the installation checklists, for both the tank and double-wall sumps, provided with the tank and return the completed checklist to the tank owner upon completion of the installation. The signed checklist, and applicable written approvals for deviations from Containment Solutions, should be retained by the tank owner and must be provided later to CSI to validate any future warranty claim.

3.1.3. Containment Solutions tanks are intended for storing products listed in the warranty; any other products not listed in the current limited warranty must be approved in advance by Containment Solutions.

4. LIMITED WARRANTY

4.1. Limited Warranty

4.1.1. Warranty shall be Containment Solutions limited warranty in effect at time of delivery.