**MEDICAL EMERGENCY WASH DOWN**

**FIBERGLASS UNDERGROUND TANK SPECIFICATION**

# Short Form Specifications

The contractor shall provide the appropriate underground fiberglass storage tank for medical emergency wash down application and any optional accessories as indicated on tank drawings. Capacity, dimensions, and fitting locations and sizes will also be indicated on tank drawings. The tank will be as manufactured by Containment Solutions, Inc. The tank will be installed according to manufacturer’s current installation instructions.

# Long Form Specification

1. **GENERAL**
	1. Quality Assurance
		1. Acceptable Manufacturers:

Containment Solutions, Inc., Conroe, Texas

* 1. Manufacturing Standards:
		1. Tank shall be manufactured to meet or exceed the requirements of U.L. 1316 Underwriters Laboratories, Inc. Glass-fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products.
		2. ASTM D4097 Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks
		3. American Concrete Institute standard ACI 318, Building Code Requirements for Structural Concrete.
	2. Submittals:
		1. Contractor shall submit to engineer copies of shop drawings for each tank and copies of manufacturer’s literature, including installation instructions and calibration charts.

# PRODUCTS

* 1. Double-Wall Fiberglass Underground Tanks
		1. Loading Conditions - Tanks shall meet the following design criteria:
			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. Surface Loads: When installed according to manufacturer’s current installation instructions, tanks shall withstand surface HS-20 axle load (32,000 lbs/axle).
			3. Internal Load: Primary and secondary tanks shall withstand 5 psig (35 kPa), or 3 psig for 12' diameter tanks, air pressure test with 5:1 safety factor.
			4. Tanks shall be designed to support accessory equipment when installed according to manufacturer’s recommendations and limitations.
		2. Product-Storage Requirements
			1. All primary tanks must be vented. Tanks are designed for operation at atmospheric pressure only.
			2. Tanks shall be capable of storing liquids with specific gravity up to 1.1.
			3. Tank must be operated at ambient temperature
			4. Tank shall be capable of storing the following products:

## Chemicals not to exceed 150°F (optional to 180°F) at the tank interior surface

* + - * + The tank will normally be empty and will be used to temporarily contain chemicals after some emergency event. The tank is not designed for the continuous storage of these chemicals. To insure short exposure times, the tank must be emptied and then rinsed and cleaned of any residual chemicals within 72 hours of use.
		1. Materials
			1. The tank shall be manufactured as a matrix of premium resin modified to include a 0.100” liner with surface veil and an epoxy novolac vinyl ester resin like Derakane 470 or equivalent, glass fibers and silane-treated silica that together result in a composite providing improved corrosion protection.
			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.
			3. Tank to include liner with surface veil on 100% of the tank interior surface per Section 7.1.1 of ASTM D4097 (Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant Tanks).
		2. Dimensional Requirements (refer to Containment Solutions literature)
			1. Nominal capacity of the tank shall be gallons / liters.
			2. Nominal outside diameter of the tank shall be feet.
			3. Nominal overall length of the tank shall be feet.
		3. Monitoring Capabilities
			1. Double wall 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. 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 (3 psig maximum)
				+ External hydrostatic pressure – 7’ maximum groundwater head pressure over tank top
			1. 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. The monitoring fitting for the monitoring space shall be a 4” NPT fitting.
			3. 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.
			1. 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. 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.
			3. Hydrostatically monitored solution used in the monitoring space shall be compatible with the tank and be of a contrasting color to the tank.
	1. Accessories
		1. Flanged Manways
			1. The standard manway is 22” I.D. and will be furnished with gaskets and carbon steel cover.
			2. Location – see standard tank drawings.
			3. Optional: manway extension shall be fiberglass and feet long.
		2. Tank Bottom Deflector Plates:
			1. Fiberglass plates will be installed under each service fitting and manway opening.
		3. Secondary Containment Collar
			1. Tank entry warning label shall be affixed to collar.
			2. The collar shall be fiberglass reinforced plastic, 42” or 48” in diameter and shall be factory-installed in accordance with drawings.
			3. The collar shall include an internal adhesive channel.
		4. Adhesive Kit (Kit AD)
			1. Alcohol compatible adhesive kit shall provide a watertight seal at the tank sump and containment collar joint to prevent the ingress or egress of water. The adhesive kit includes resin, catalyst, mixing stick, putty knife, sandpaper, grout bag, and installation instructions.
		5. Tank Sumps
			1. Tank sump components shall be constructed of fiberglass reinforced plastic and provided by the tank manufacturer.
			2. UL label shall be affixed to tank sump components.
			3. The tank sump shall be 42” or 48” in diameter and must mount to the secondary containment collar. Standard tank sump shall consist of an octagon shaped base (round base is optional), round body extension and enclosure top.
			4. The octagon 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.
			5. A 34” O.D. watertight lid shall be provided at the manway location of the tank and provide a watertight seal to the sump enclosure with12” of water above the lid and remain leak free.
			6. Refer to tank sump drawings for standard models and configurations.
		6. Anchor Straps
			1. Straps shall be supplied by the tank manufacturer.
			2. Number and location of straps shall be as specified by manufacturer.
			3. Each strap shall be capable of withstanding a maximum load of 25,000 lbs.
		7. Prefabricated Concrete Deadmen Anchors
			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 to fit specified tank
				+ Provide adjustable anchor points for hold down straps
			1. Deadman anchors shall be supplied by the tank manufacturer
		1. Fittings Threaded NPT
			1. All threaded fittings shall be located on a manway cover or the tank top center line. Fittings to be supplied with temporary thread protectors or threaded plugs.
			2. All standard fittings shall be 4” diameter NPT half couplings.
			3. Internal piping shall be terminated at least 4” from the tank bottom (6” for 12’ diameter tanks).
		2. Fittings – Fiberglass Gusseted Nozzles:
			1. All fiberglass nozzles will be supplied with flat-faced flanges and bolt pattern in accordance with ANSI B165, Class 150.

## Fiberglass nozzles shall be constructed of epoxy novolac vinyl ester resin like Derakane 470 or equivalent.

1. **ELECTRONICS**
	1. Control Panel for Float Switch Sensors
		1. Provide an electronic control panel constructed of U.L. listed, electronic components. The control panel power source is 120 volts AC (contractor provided wiring). The sensor monitoring circuit is an intrinsically safe circuit, i.e., the circuit incapable of releasing sufficient electrical or thermal energy to cause ignition of specific hazardous material under “normal” or “fault” operating conditions.
			1. The model number shall be Model CPF or approved equal as provided by Containment Solutions.
			2. The number of monitoring circuits shall be determined by the number of sensing devices.
			3. The electrical components rating shall be Weatherproof (NEMA 4).
			4. The dimensions of the control unit are 11.5” x 8” x 4.5” deep.
			5. The total power consumption is 0.1 amps and 120 VAC.
			6. The monitoring circuit power is 12 Volts D.C. at 15ma.
			7. Both the model FHRB810 Hydrostatic Brine Reservoir Dual Float Sensor sensor and the FOVF600 Single Point Overfill Alarm Float Switch interface alarm sensor are to connect at the Model CPFcontrol panel.
			8. All CPF control panels include:

## Alarm lights for each circuit

* + - * + Warning horn
				+ Auxiliary dry contacts switch output for each sensing circuit
				+ Panel housing materials: steel, epoxy coated
				+ Alarm horn silence switch
				+ Containment Solutions electronics do not require shielded cable. Sensor cable uses #18 AWG up to 5000 feet (provided by contractor).
		1. All wiring materials are provided by the contractor. Wiring is required from the power source to the control panel and from the control panel to the probe assembly. Sensor wires must be in a separate conduit from the power wires.
	1. Single Point Overfill Alarm Float Switch:
		1. Provide a sensor that can be used to determine the liquid level has reached a critical High Level in the tank.
			1. The sensor is to be model FOVF 600 S by Containment Solutions.
			2. The contractor is responsible for referring to Containment Solutions Installation Instructions for lengths and accessories need for installation.
	2. Hydrostatic Brine Reservoir Dual Float Sensor
		1. Provide a sensor that is designed for monitoring Hydrostatic Reservoirs of double wall fiberglass tanks.
			1. The hydrostatic reservoir sensor shall include two floats on a stem with two predetermined set points.
			2. The assembly is designed to operate in brine solution.
			3. The sensor shall be supplied by Containment Solutions. The model number shall be FHRB 810. Each tank is to have one FHRB 810 per tank.
			4. Sensor must be installed per tank manufacturer’s current installation instructions.
			5. Brine level in tank reservoir must be set per manufacturers installation instructions based on liquid level in tank at time of installation of sensor.

# TANK TESTING AND INSTALLATION

* 1. Tank Testing and Installation
		1. Testing - Tank shall be tested and installed according to the CSI Installation Instructions in effect at time of installation.
		2. Installation - Tank shall be installed according to the CSI Installation Instructions in effect at time of installation. Contractor shall be trained by the tank manufacturer

# LIMITED WARRANTY

* 1. Limited Warranty
		1. Warranty shall be Containment Solutions Chemical Tank limited warranty in effect at time of delivery.

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