

Protektor II Guide Specifications

Fiberglass reinforced Plastic(FRP), 100% secondarily contained, horizontal, heated, above-ground storage tanks for produced water and liquid hydrocarbon (NOT FOR FUEL)

Part 1: General

1.01 Quality Assurance

A. Acceptable Manufacturer:

1. FRP tanks: ZCL Composites Inc.
2. Anchoring Systems: ZCL Composites Inc.

B. Standards:

The basic structure of the tank complies with or exceeds the structural performance requirements of Underwriters' Laboratories of Canada (ULC)-ULC S-615-98, Standard for reinforced Plastic Underground Tanks for flammable and combustible liquids. The manufacturer shall complete and hold on record such Quality Assurance documentation as may be required by the above standard. No ULC label shall be required.

1.02 Submittals

- A. The Contractor shall submit _____ copies of drawings for each tank. Drawing shall show locations of all fittings, accessories, hold down points, and critical dimensions.
- B. The Contractor shall submit _____ copies of Gauge Chart for each tank indicating contained volume (in litres) of each tank for each centimetre of depth of contained liquid. Gauge Charts shall be based on actual tank capacity and shall be accurate within 0.1% of tank volume.

Part 2: Products

2.01 Fiberglass reinforced Plastic (FRP), 100% secondarily contained, horizontal, heated, above-ground storage tanks for produced water and liquid hydrocarbon (NOT FOR FUEL)

A. Design

1. Tank(s) shall consist of a primary compartment, completely enclosed within a secondary wall.
2. Tank(s) shall have integrally molded ribs for reinforcement of tank walls and hemispherically shaped heads for structural strength.
3. Tank(s) shall be saddle mounted so that they may be placed on an appropriate mounting system consisting of a factory supplied pre-cast reinforced concrete pad.
4. Tank(s) shall be constructed of such materials, and by such processes, that they shall not break, collapse or corrode due to exposure to the designated contents of the tank as stated in the purchase documents, for a period of one(1) year.
5. Tank(s) shall be insulated with 2" of polyurethane and coated with a UV inhibitor top coat.
6. Tank(s) shall be heated by an integral, explosion-proof, gas fired infra-red heater to ensure that the content does not freeze. This heater assembly shall be equipped with the appropriate starting equipment, piping and fittings to allow for easy installation on site.

7. Tank(s) shall be appropriately vented so that internal pressures are kept to a minimum. The vent shall be designed so that the majority of mist is removed before the vented stream is released into the atmosphere. The vent shall be protected from freezing and the accumulation of debris.
8. Tank(s) shall be supplied with a 1 to 1 mechanical, vertical, liquid level gauge that allows for easy volume readings taken from the ground.
9. Tank(s) shall be supplied with interstitial space monitoring, go-no-go visual leak detection device placed near the low point on the exterior wall, to ensure tank's overall structural integrity.
10. Tank(s) shall be supplied with the inlet and outlet piping assembly protected from freezing and vandalism.
11. Tank(s) shall incorporate protection from static electricity charge build-up.
12. Tank(s) shall have a lockable heater and /or piping enclosure.
13. Tank(s) shall be equipped with a 4" NPT nipple to allow for the installation of a pneumatic Hi-Level alarm to be installed on the primary storage compartment at a suitable level to reduce the potential for over filling the tank .
14. Tank(s) shall be equipped with at least one 4" FNPT coupling on top centre line to act as a spare nozzle for future use.

B. Testing

1. Each tank, or compartment shall be tested by the manufacturer with 35kPa(5psi) internal pressure to ensure that it is air-tight. During the pressure test, the exterior of the tank shall be inspected to ensure that it is free of leaks.

2. Each tank shall be designed such that it is capable of being subjected to a precision leak test after installation.

C. Pressure Rating

1. Except while being tested in accordance with the manufacturer's Installation Instructions, or other methods approved by the manufacturer, the tank(s) shall not be subject to pressure or vacuum in excess of the values indicated. Tank(s) shall be vented at all times.

D. Product Storage

1. Tank(s) shall be capable of storing liquids with specific gravity up to 1.10 s.g..
2. Contact ZCL's Engineering Department or Customer Service Representative for information on allowable product storage.

2.02 Anchoring System

A. Design

1. The tank(s) shall be mounted on an engineered pre-cast concrete mounting pad designed for the loads and displacement of the weight of the tank and cargo.
or
2. Tank(s) shall be mounted on a factory supplied "Skid Frame" which in turn is welded on top of a level engineered steel pile base mounting structure designed for the loads and displacement of the weight of the tank and cargo.
3. The tank(s) shall be bolted in place to resist wind loads and excessive movement.

B. Loading Conditions

1. When installed according to manufacturer's instructions, anchoring package shall be able to withstand all loads.

C. Materials

1. Engineered precast concrete mounting pad shall be constructed from 25 Mpa minimum strength, Type 50 concrete reinforced internally with steel reinforcing bar. All internal reinforcement to be cross tied to prevent pull-out of hold down points.
2. Hold down bolts shall be of steel construction with galvanized coating.

2.03 Standard Accessories

The following accessories shall be provided with each tank:

- A. Two (2) lift lugs straddling the centreline of tank, evenly spaced to offer a balanced lift. Lift lugs shall be designed to carry four (4) times empty weight of tank.
- B. Gauge chart with headings at 1cm intervals.
- C. Calibrated Dip stick at 1cm intervals, calibrated top mounted 1:1 mechanical liquid level gauge to be mounted into a 4" NPT coupling.
- D. Ten inch (10") gooseneck free vent complete with bird screen, two (2) inches of insulation and protective coating, ten (10) inch Vent Flange and fasteners.
- E. An inlet and outlet FRP Flat Face Flanged Nozzle, 50psi. 150# ANSI (drilling) in the appropriate size at the location shown on the drawings. Complete with the appropriate piping and fittings to allow hook-up and drain.
- F. A two (2") inch NPT horizontal interstitial space inspection nozzle placed on the secondary containment, complete with a go-no-go visual leak indicator.

- G. A four (4") inch NPT horizontal high level nozzle placed on the primary storage compartment.
- H. A four (4") inch NPT coupling set on top centre of tank to act as a spare.
- I. Four (4) tie-down lugs for attaching tank to transport during shipping.
- J. An integral, explosion-proof, gas fired, Infra-red heater placed below the tank and protected from the environment by an insulated enclosure. This heater assembly shall be equipped with the appropriate starting equipment, piping, and fittings to allow for easy installation on site.
- K. Precast concrete mounting pad designed specifically for the appropriate tank. Complete with the necessary hardware to ensure that the tank is securely anchored to the pad.
- L. Installation instructions for all above components, including instructions for site preparation.

Part 3: EXECUTION

3.01 Installation

- A. Tank(s) shall be installed according to tank manufacturer's current Installation Instructions (provided with tank(s)) as well as all applicable Municipal, Provincial and Federal Codes. All deviations from published Installation Instructions must be approved in writing by tank manufacturer.

3.02 Tank Testing

- A. Tank(s) shall be tested if there appears to be any physical damage on the exterior surface as a result of shipping. See the Installation Instructions for detailed testing procedures.