

# Design Tanks, LLC

## *Brinemakers* by Design Tanks, LLC



Design Tanks, LLC has over 40 years of fiberglass manufacturing experience. Centrally located in Sioux Falls, South Dakota, we can provide national exposure to our valued customers. With responsive sales/service, value added Engineering and streamlined manufacturing processes, we will satisfy our Customer's needs with the most cost effective brine making solution available.

Whether you need a brine storage tank or a complete operating system, we can customize our product with components (pneumatic fill line, vent/dust collection, brine plenum, automatic liquid level system, etc.) to meet your specific requirements.

When given the opportunity, our Brinemakers allow Companies to realize the benefits of saturated brine. In addition to obvious bulk salt advantage, consistency of product and meeting "peak-demand" requirements, companies quickly recognize increased warehouse space and decreased work related injuries versus handling individual salt bags.

Over the years, meeting soft water requirements has been a difficulty for a variety of industries; laundries, correction facilities, etc., furthermore, with our FDA compliant resins and post curing, we offer the Food & Beverage Industry a cost effective FRP alternative.

For high usage (50 GPM and over) demand Customers, **Design Tanks, LLC** recommends; in conjunction with our Brinemaker, incorporating a brine day tank (reservoir) within the brine withdrawal system. In some cases, companies make unrealistic demands upon Brinemakers. To ensure saturation and avoid channeling, the brine making rate should not exceed 0.5 gpm per square foot of cross-sectional area. Be aware, with vacuum granulated salt, the maximum brinemaking rate is 40 gpm for a 10'-0" diameter tank and 50 gpm for a 12'-0".

# Brinemaker components/nomenclature:

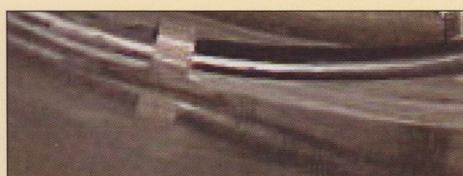


## **Pneumatic Fill Line-**

Air unloading salt creates an abrasive situation. To remedy this, we utilize a Type 304 stainless steel fill line. Bolted to the center of the tank top, a typical fill line consists of; one-180 degree radius section, one-vertical straight section with 3/4" water injection port and one-Kamlock adaptor with screened/vented cap.

### Note:

Depending upon truck accessibility, our radii fill line can be one piece (180 degree radius) or two-piece (90 degree). With a two-piece radius and a horizontal straight run, we can customize the fill line to meet your specific tank placement.



## **Water Spray Ring-**

To increase the efficiency of the Brinemaker, the water is induced through a 1 1/2" polyethylene spray ring which is mounted around the interior circumference of the tank with 3/16" holes on 12" centers.



## **Brine collection system-**

Located on the tank bottom, our brine collection system consists of a center plenum with six lateral slotted PVC filter arms. From the top of the center plenum, brine will flow (pumped or gravity) through an internal bolted piping to an external sidewall attachment flange. When the brine is pumped directly to the in-plant usage points, to avoid line solidification, contact your Salt Supplier for a pump recommendation. Depending upon the quality of the salt, Design Tanks, LLC recommends "back flushing" our brine collection system with a low-pressure water source. Understandably, this

periodical process will enhance your Brinemaker's efficiency by dissolving solidification within the brine lines and slots.

## **Venting/Dust Control-**

To eliminate tank pressurizing in the filling phase, an 8" U-Type vent and 24" hinged manway with weighted cover is mounted on the tank's top. Connected to the U-Type vent is clamped a flexible rubber boot, which is attached to a side mounted, bracketed vertical PVC down pipe, and a polyester bag for dust control. To minimize the dust, the 3/4" water injection port on the pneumatic fill assembly should be utilized. Also, Design Tanks, LLC recommends having the bag cleaned (soak in water for 4-8 hours) after each salt loading.



# Options:

## **Pneumatic Fill Line Post - Standard**

Depending upon the Brinemaker's support pad/floor, Design Tanks, LLC offers two versions; new concrete galvanized post with two fill line clamps or existing concrete galvanized post with base pad, sidewall support brackets and two fill line clamps.



## **Access Ladder Assembly - Standard**

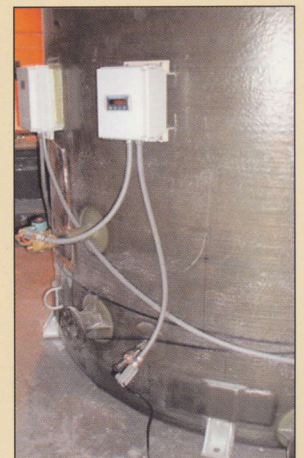
When the installation requires accessibility to the tank's top, an OSHA approved ladder assembly constructed of steel (galvanized or epoxy coated), aluminum or FRP (Fiberglass Reinforced Plastic). Depending upon the tank's height, a safety cage and/or intermediate platform may be required. In all cases, stand-offs are located, with a maximum center to center distance of 6'-0", on the tank's sidewall.

## **Freeze Protection System - Options**

In Northern climates, a heating system with insulation is required to prevent contents from freezing. Our system consists of the following:

**Insulation:** Our insulation package is located around the circumference of the tank and up 5'-0" on the tank sidewall. It consists of a two part spray-on polyurethane foam with an insulation R- value of 7.1/inch of thickness (k value of 0.14). To protect the insulation, we utilize a spray-on overcoat. The overcoat is a polyurethane elastomer base coat overlaid with a white Hypalon elastomer, totaling 20 mils dry thickness. Besides excellent UV protection, the overcoat materials are rated as Class A flame retardant materials, per UL 790.

**Heating:** Our heating system consists of electrical (20 amp/120V) panels with a single master control thermostat. To eliminate potential tank damage, each individual panel is equipped with a "high temperature shut-down" feature. By locating the panels on the lower sidewall, the panels can be periodically checked. After years of service, an individual panel can be replaced by; cutting the insulation, removing the old panel, installing the new and replacing the old insulation.



## **Automatic Liquid (brine) Level Control System-**

In order to maintain a constant liquid level in our Brinemaker, we incorporate a pressure transducer, which sends a signal to a digital panel meter to open or close a solenoid valve located in the water supply line, to regulate/control the system. Additionally, the digital panel meter is capable of sending a 4-20 ma output (remote PC or laptop) and optional relays for visual on/off light/s and /or audible alarm.

## **Automatic Solid (salt) Level Control System-**

Several systems are available. Contact **Design Tanks, LLC** for information.

# Saturated Brine Facts:

- ◆ One gallon of saturated brine weighs 10.027 pounds.
- ◆ One gallon of saturated brine contains 2.647 pounds of salt.
- ◆ One gallon of water will produce 1.13 gallons saturated brine.
- ◆ One gallon of water will dissolve 2.991 pounds of salt.
- ◆ One ton of salt will produce 755.5 gallons of saturated brine.

## Salt Facts:

Southern Rock or Coarse Solar Salt  
(approximately 44% void volume)

- Maximum brine making rate
  - 10'-0" diameter tank-20GPM
  - 12'-0" diameter tank-25 GPM

- Weight per foot of tank height
  - 10'-0" diameter tank-2.7 ton
  - 12'-0" diameter tank-3.8 ton

Vacuum Granulated or Fine Solar Salt  
(approximately 40% void volume)

- Maximum brine making rate
  - 10'-0" diameter tank-40 GPM
  - 12'-0" diameter tank-50 GPM

- Undissolved Salt per foot of tank height
  - 10'-0" diameter tank-3.0 ton
  - 12'-0" diameter tank-4.2 ton

## Design Tanks, LLC

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