

Products and Services

Ion Exchange Equipment, Filters & Degasifiers

- Commercial/Industrial Softening Systems
- Primary-Polishing Softening Systems
- Mobile/Portable Softeners, Demineralizers and Filter Systems
- Two-bed/Mixed-bed Demineralizing Systems
- Bulk Ion Exchange Resin Regeneration Plants and Equipment
- Multi Media, Activated Carbon, Sand and Anthracite Filtration Systems

Membrane Technology

- Brackish Reverse Osmosis Systems
- Hollow Fiber, Spiral Wound Ultrafiltration Systems
- Reverse Osmosis, Ultrafiltration Replacement Membranes
- Seawater Reverse Osmosis Systems
- Ultrapure Hyperfiltration Systems

Other Products & Services

- Welded Carbon and Stainless Steel ASME Code and Non-code Pressure Vessels
- Waste Treatment and Neutralization Systems
- Solid State and Electromechanical Industrial Controls
- Fiberglass Bulk Brine Storage Tanks and Systems
- Field Technical and Repair Services
- Custom Piping Systems - Welded Steel, Stainless Steel, Plastic
- Ion Exchange and Filtration Replacement Media

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BULK SALT BRINEMAKERS (PNEUMATIC FILL TYPE)

A Complete Salt Storage-Saturator System

AA Tech's bulk salt brinemakers are designed to meet modern industry's need for automatic storage and saturation of brine. They are applicable for use with all types of industrial salt: evaporated, solar and rock. Each brinemaker is custom built to fit your application and are provided with all accessories necessary to provide fully automatic system operation and process interaction.

Use of a brinemaker will automatically provide a continuous supply of 100% saturated brine for use in your process. Operation is simple. Bulk salt is purchased directly from a local salt supplier and transported to your facility in special blower equipped trucks. On arrival the transport carrier operator connects a flexible hose to the 4" salt fill tank connection and pneumatically off-loads the bulk salt leaving you with a replenished salt inventory.

Fresh water automatically introduced to the salt (sodium chloride) uniformly saturates as the salt inventory is dissolved. Saturation is usually considered complete when 2.6 pounds of salt is dissolved per gallon of water. When the salt inventory is depleted to a level suitable for refill the salt vendor is notified while the remaining excess salt inventory continues in use giving reasonable time for delivery.

AA Tech brinemakers are available in 20, 40 and 80 ton sizes which enable delivery of 10 to 25 ton loads.

STANDARD FEATURES

• Corrosion Free Fiberglass Construction

Silo construction is heavy wall filament wound fiberglass utilizing a interior premium grade vinylester resin for protection against sodium hypochlorite deterioration formed through the reaction of chlorine in the incoming makeup water and the salt inventory.

• Stainless Steel Salt Fill Line

A 4" 304 stainless steel salt fill line is provided for the connection of the delivering carrier flexible hose. It is looped to the center of the silo to a even salt fill and is unobstructed to prevent blockage during unloading.

• Liquid Level Controls

The silo is equipped with an external liquid level sensor to detect and control the liquid saturated brine provided to the consuming process. The level controller is electrically interconnected to a 2-way water solenoid valve which controls the on-off refill flow of makeup water to the silo spray nozzles.

• Makeup Water Distribution Spray

The silo is equipped with full cone spray nozzles in the upper interior head to evenly distribute the incoming makeup dilution water. This exclusive spray system, eliminates center cone buildup and provides uniform dissolving of the salt inventory and rapid saturation.



• Salt Dust Collection

The silo vent is equipped with a hanging polyester dust collection bag designed to collect salt dust generated by the pneumatic filling operation. The bag will easily handle the normal 1400 cfm air flow required and is designed to handle 2800 cfm providing a 100% safety factor. It is equipped with a corrosion free zipper for removal of the dust solids.

• Access Ladder

The silo is equipped with a welded aluminum ladder to access the hinged top manway for inspection of the salt inventory level. On silo's over fifteen feet the ladder is equipped with a safety cage for protection of the operator.

• Optional Accessories

The silo system can be supplied with a variety of accessories to meet your demands.

For single source responsibility AA Tech can provide;
Transfer Pump(s) Volume measuring Meter(s)
% Saturation Instrumentation High-Low Level Alarms
Automatic Discharge Control Valving

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GENERAL INFORMATION

Applications for bulk brinemaker systems are too numerous to list. Most common applications include regenerant brine preparation for large commercial and industrial water softening systems eliminating the need for handling large quantities of bagged salt. Other applications include oil field brine flooding and food product brine pickling.

Salt (Sodium chloride NaCL) is a granular material, readily dissolved by water producing a brine solution. This solution is fully saturated when the dissolved salt content reaches 2.6 lbs per gallon. Once this saturation concentration is obtained no more salt will dissolve. The specific gravity of saturated brine is 1.197 and one gallon will weight 9.94 lbs.

Granular salt is available in several grade consistency's; Coarse, medium, fine and food grade. For general applications, coarse or medium grades of rock salt is best for use in brine makers. These grades provide a larger void area for the brine solution to occupy, thus will provide a larger available volume of brine per foot of silo depth. The finer the grade the smaller the void area, the lower the entrained volume.

For purposes of calculation, generally 35% of the salt volume is considered the void area available for actual storage of the liquid saturated brine solution.

Using the following as a guide you can calculate the liquid volume (gallons) and pounds (lbs) of salt dissolved in that volume per foot of silo depth

Diameter of Silo	Gallons Available per foot of depth	Pounds Salt Dissolved per foot of depth
8'-0"	130	338
10'-0"	200	520
12'-0"	300	780

BRINE MEASURING AND PUMPING

Saturated brine prepared in the brine maker is collected through the lower PVC brine collector install directly on the bottom of the silo. This collector is covered with graded gravel to prevent small undissolved salt granules from entering the process piping.

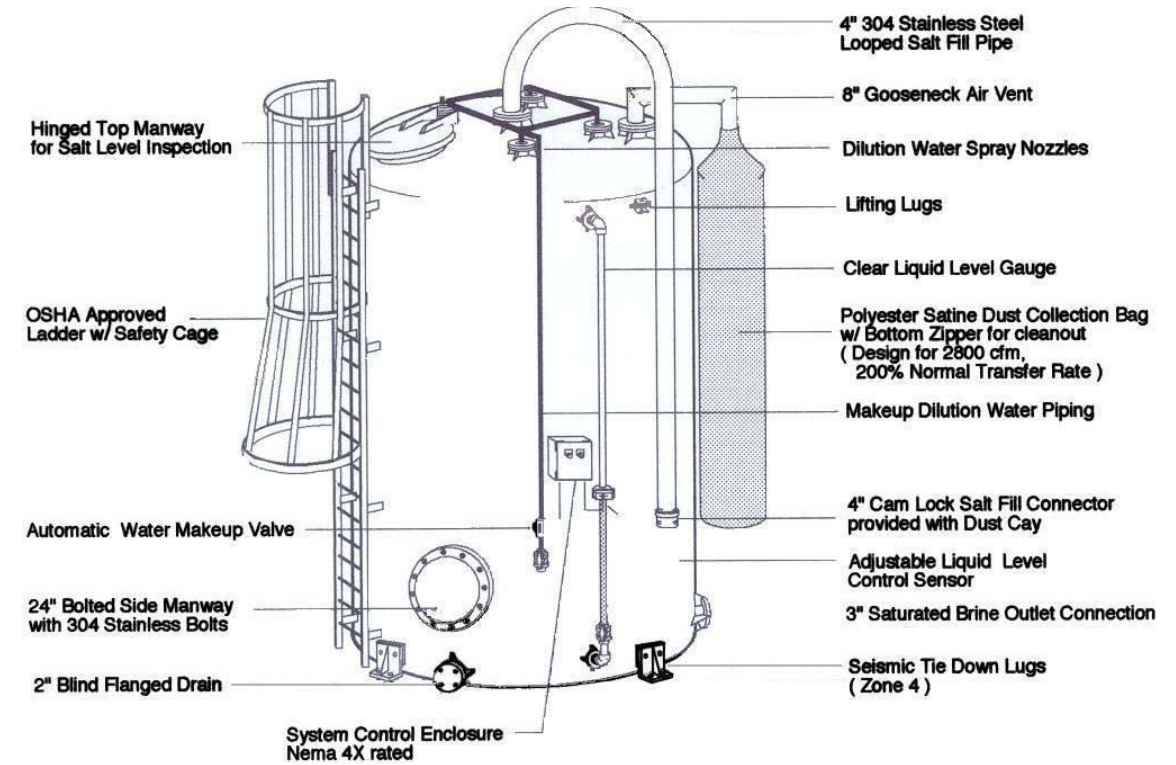
Since brinemakers can only provide saturated brine. Concentrations less than saturation will required additional dilution equipment located external to the silo. Generally mixing tees are employed for this purpose which combines dilution water and saturated brine proportionally to effect the desired concentration.

The saturated brine can be pumped from the silo by the use of electrically driven pumps (magnetically seal-less type recommended). Vacuum water operated eductors can also be employed to suck the saturated brine from the silo while at the same time provide a controlled concentration.

In some cases it is desirable to monitor or batch the amount of saturated brine leaving the silo. Numerous methods are available depending on the type of output information required by your controlling process. Electromechanical water meters of the all bronze turbine type equipped with batch type auto-reset register are in common use for this purpose. Solid state transmitters are employed which integrate well with microprocessor based logic controllers. Preset volume can also be control by time when coupled with a pressure compensating flow controller installed on the discharge of the saturated brine transfer pump.

AATech has a staff of competent engineers available to assist you in the preliminary and final design of your system. Call 800-303-2845

DESIGN DATA & DIMENSIONS



SPECIFICATIONS

Model Number	BS20-812	BS40-1015	BS80-1220
Storage Saturator Vessel Size Nominal Storage Size, Full	8' Dia x 12' Str Side 20 Tons	10' Dia x 15' Str Side 40 Tons	12' Dia x 21' Str Side 80 Tons
Loading Capacity (Dry Salt) Initial Dry Salt Loading, 85% of full volume	17 Tons	34 Tons	68 Tons
Undissolved Salt Remaining Prior to Refill Based on maximum refill volume per load	7 Tons 10 Tons	9 Tons 25 Tons	43 Tons 25 Tons
Saturated Brine Liquid Capacities Factory Preset Liquid Level Void Volume of Saturated Liquid at Maintained Level Medium Grade Salt, 35% Void Pounds of Salt Contained in Sat Liquid Volume	4'-0" 520 Gallons 1,352 lbs	4'-0" 800 Gallons 2,080 lbs	4'-0" 1,200 Gallons 3,120 lbs
Continuous Saturated Brine Producing Capacity Continuous Salt Dissolved per Minute	15 gpm 38 lbs per minute	20 gpm 52 lbs per minute	40 gpm 103 lbs per minute
Weights Empty Tank and Contents Operating Tank, Components, 85% Salt and Liquid	2,000 lbs 40,200 lbs	3,000 lbs 77,000 lbs	4,100 lbs 142,000 lbs
Dimensions: Width x Depth x Height	115" x 115" x 196"	136" x 136" x 242"	160" x 160" x 313"

Salt capacities shown are based on an average salt weight of 68 lbs per cu. ft. Depending on the source of salt, the weight of salt can range from 65 to 72 lbs which is generally due to crystal size and moisture content of the delivered salt.

NOTE: Industrial grade saturators are supplied with a gravel bed to cover a drilled Sch 80 PVC saturated brine collector system. Food grade tanks can be equipped with a 316SS collector covered with 60 mesh polypropylene screen without the gravel subfill to facilitate cleanout and complete sterilization. Food grade tanks can be equipped with a tank washing spherical type omnidirectional spray nozzle cluster for distribution of hot cleaning solutions at 180 to 210 deg. F. In some applications where sterilization using forced hot air is used to bring interior temperatures above 180 deg. F, caution should be taken not to exceed 210 deg. F.

BULK BRINEMAKER FLOW DIAGRAM

