

GUIDE SPECIFICATION

HORIZONTAL UNDERGROUND FIBERGLASS BRINERS

SINGLE WALL AND DOUBLE WALL

PART 1 - GENERAL

1.1 PRINCIPAL WORK IN THIS SECTION

- A. Brine Tank for underground installation, single or double wall, horizontal, cylindrical, fiberglass tank, compatible with salt, salt brine, and potable water products. When required, all components shall meet NSF61 requirements and the briner shall bear the NSF61 label.

1.2 QUALITY ASSURANCE

- A. Refer to Section _____: General Provisions for Plumbing Work.

- B. Reference Standards:

Tank manufacturer shall be listed by NSF under NSF/ANSI Standard 61 Drinking Water System Components – Health Effects

Tank manufacturer shall be in the business of manufacturing tanks with materials conforming to the requirements of ANSI/AWWA D120-02 Thermosetting Fiberglass-Reinforced Plastic Tanks

Tank manufacturer shall be in the business of manufacturing tanks to UL 1316 standards

American Society for Testing and Materials (ASTM) Standards ASTM D883: Standard Terminology Related to Plastics

U.L. - Underwriters Laboratories, Inc

1.3 SUBMITTALS

- A. Submit product data, drawings, and test reports for the following items per the provisions of Division 1 and this division's General Provisions:

The manufacturer shall submit a complete set of scale shop drawings detailing dimensions of heights, diameter, elevations to invert, pipe sizes, pipe connections, fittings and other appurtenances

Catalog data

Manufacturer's installation instructions

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Underground Brine Tanks:
BrineMaker, Inc. 800-998-7345 US Patent #8,695,632

Or approved equal
- B. Underground briner supplier shall have provide documentation of testing conducted to demonstrate the effectiveness of their salt distribution system design for briners exceeding 10' in length
- C. Underground briner supplier shall be regularly engaged in the design and engineering of underground fiberglass briners and upon request, shall provide a list of installations including the system OEM and end user contact name(s) and phone number(s)

2.2 FIBERGLASS UNDERGROUND LISTED STORAGE TANK (LISTED FOR POTABLE WATER)

- A. Loading Conditions – The brine tank shall meet the following design criteria:

Internal Load – All brine tanks shall be testable and shall withstand a 5-psig air-pressure test with 5:1 safety factor. Maximum test pressure is 5 psig

Surface Loads – brine tank shall withstand surface H-20 and HS-20 axle loads when properly installed according to manufacturers current Installation Manual and Operating Guidelines

External Hydrostatic Pressure and Burial Depth – tank shall be capable of being buried in ground with 7' of overburden over the top of the tank, the hole fully flooded, and maintain a safety factor of 5:1 against general buckling

The brine tank shall support accessory equipment – such as manways, manway extensions, collar/ risers, FRP inlet/outlet piping, baffle wall, anti-vortex plates and pump platforms when installed according to tank manufacturers current Installation Manual and Operating Guidelines

Buried tanks shall be manufactured with integral trapezoidal ribs for structural integrity
- B. Product Storage

Tank shall be capable of handling liquids with specific gravity up to 1.3

Tank shall be vented to atmospheric utilizing a dust bag to capture salt dust while having sufficient surface area and fabric design to prevent over-pressurization of the briner

Tank shall be capable of handling salt brine at ambient temperature

C. Materials

Tank shall be manufactured with 100% premium resin (Terephthalic polyester or highly cross-linked Isophthalic polyester resins for the exterior and NSF Listed resin for the interior only), and chopped glass. No fillers or extenders shall be used. No General, Orthophthalic, or odd lot resin shall be used

All associated internal mounting hardware shall be rustproof

All exposed internal FRP components to be constructed using NSF listed materials (when required)

All materials used in the construction of the vessel and appurtenances shall be compatible with salt brine

D. Interstitial Space for Double-Wall Application

Tank shall have a space between the primary and secondary walls to allow for the free flow and containment of leaked product from the primary tank. The space also allows the insertion of a monitoring device through a monitoring fitting

Each interstitial space monitor fitting shall consist of a 4" NPT fitting

E. Vessel shall be post cured to meet NSF requirements and shall bear the NSF61 label (when required)

2.3 STANDARD FEATURES

A. Manway Opening

Provide at least one 30" flanged manway opening with extension to grade with watertight cover

When an internal ladder is provided, a section of ladder shall be integral to the extension

B. Standard Connections

Water Inlet: 1" flange with 1" interior water distribution header system

Brine Outlet: 2" flange with 2" internal collection plenum and check valve

Level Sensor: 3" flange with internal stilling well and support

Vent: 8" flange, mating flange assembly and "extended neck" dust bag + SS clamps

Vac. Relief: 2" flange with true union ball check valve assembly

Salt Inlet: 6" flange with interior 4" SS header (for even salt distribution throughout vessel)
+ 4" SS flanged extension to grade + quick connect and cap

C. Fitting Enclosures

(2) 42" diameter x 36" tall (other heights available depending on burial depth) enclosures shall be provided for the connections as identified in section B above

Enclosure shall be cut to length and bonded in the field - by others

D. Lifting Lugs

All Tanks shall have lifting lugs that are capable of withstanding weight of tank with a safety factor of at least 2:1

2.4 OPTIONS

A. Water Level Control System

The Water Level Control System shall consist of a radar level sensor, controller with LED readout, relays, and 4-20mA repeater, NEMA 4X enclosure, solenoid valve, 3" flanged connection with interior stilling well, and sensor mounting assembly

B. Salt Level Indication System

Salt level indication is indicated by the use of a Brine Concentration Monitoring System with "Flow Cell" installation TEE, submersible torroidal conductivity sensor with 4-20mA signal, controller with LED readout, relays, and 4-20mA repeater

C. Ladder

Interior FRP ladder(s) (when required, ladder shall be NSF Listed under ANSI/NSF Standard 61)

Manway extension to grade shall include a ladder section

- D. Dust Bag Housing
 - Protect the dust bag from the elements and the briner from over-pressurization
- E. NSF 61/ANSI Labeled
 - Certified to NSF 61/ANSI (for potable water)
- F. Gravel Bed
 - The brine collection plenum shall be covered by 7" of 1/4" – 1/2" and then 5" of 1/8" – 1/4" NSF/AWWA quartz stone to serve as a filtration layer (as recommended by Morton Salt)
- G. Traffic Covers - 3
 - (3) H25 rated fiberglass traffic covers for grade access to fitting housings and manway
- H. Complete Anchorage System
 - The Complete Anchorage System shall consist of precast concrete deadmen, fiberglass straps, and turnbuckles
- I. Day Tanks
 - Fully equipped HDPE Day Tank including inlet, outlet, drain, level, vent, manway and restraint system in 540, 1,090, 1,550, or 2,500, or 4,925 gallons capacity.

2.5 PERFORMANCE

- A. Salt Distribution: Salt shall be distributed evenly throughout the briner via a roof mounted stainless steel distribution header such that there is one connection point for the delivery truck. Briner manufacturer shall have conducted salt distribution testing to verify and demonstrate the effectiveness of the distribution system. Distribution header shall be supported as necessary to prevent damage during transit, offloading, and installation.
- B. Water Inlet: Water shall be distributed evenly throughout the briner via a roof mounted sch 80 PVC distribution header such that there is one connection point. Distribution header shall be supported as necessary to prevent damage during transit, offloading, installation, and use.
- C. Brine Collection: Brine shall be evenly collected from the briner via a collection plenum whose length shall be no less than the shell length of the briner – brackets shall be spaced $\leq 48"$ apart. Connecting piping to the roof mounted connection flange shall be bracketed to the side shell of the briner in 4 (min) equally spaced locations. Connecting piping shall include a check valve.
- D. Vent: Vent connection shall be 8". A dust bag shall be included and designed to capture ≥ 1 micron particles with 90% efficiency and shall be sized to provide sufficient venting to prevent over-pressurization of the briner.

- E. Vacuum relief shall prevent excessive vacuum on vessel

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Tank shall be installed according to the Manufacturer's Installation Manual and Operating Guidelines for Underground Brine Tanks

3.2 TESTS

- A. Tank shall be tested according to the Manufacturer's Installation Manual and Operating Guidelines for Underground Brine Tanks

PART 4 - WARRANTY

- A. Briner vessel shall be warranted for one year
- B. Salt fill line shall be warranted for five years
- C. Dust bag shall be warranted for 90 days
- D. Electronics shall be warranted per manufacturer's standard
- E. Ladder shall be warranted for one year

END OF SECTION

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