



INSTALLATION of STORAGE TANKS

Your new storage tanks have been manufactured using the finest materials, design, and manufacturing techniques. Customer process requirements will dictate actual operation, but the vessel will perform to design conditions found on the tank identification label. Extreme care should be taken to prevent exceeding these conditions. Keep all high heat sources or open flame away from the tank as materials of construction are flammable unless a flame retardant resin has been used.

Inspection for damage in transit is the customer's responsibility. If damage has occurred, a claim should be filed with the carrier by the customer. If no claim is filed, the customer accepts all future responsibility for damaged tanks.

INSTALLATION: Concrete pad

Proper fill soil conditions, pad design, and construction is the responsibility of the customer.

- A. Site selection – site soil must have sufficient load bearing characteristics and adequate drainage.
- B. Design of pad – Concrete pad thickness and reinforcement should be designed for minimal deflections under a fully loaded tank.
 - 1. Pad surface must be free of cracks, depressions and vertical projections so that the tank has continuous bottom support. We recommend 1/4" levelness in ten feet. Special attention must be given to the bottom edge of the tank. This edge **MUST** be in complete contact with the pad. If it is not, please contact FRP Manufacturing (2010) Inc. at for specific instructions on shimming under tank.
 - 2. In order to provide continuous contact between the tank bottom and the foundation, and to compensate for surface irregularities in the foundation and the tank bottom, cushioning comprised of 1" thick closed neoprene rubber may be laid over the entire foundation, extending to the edge of the cylinder tank wall. Sweep the foundation before applying the cushioning, and take care to prevent gravel or foreign objects from getting into the foundation when applying the cushioning. Also inspect the bottom prior to setting it on the cushioning to make certain that no gravel or foreign object is accidentally adhering to the tank bottom.
 - 3. When connecting piping to flanges on the tank, recognize that the tank may settle under some load. Some flexibility must be built into the piping since very rigid mounting may transmit excessive force into the tank fittings when that occurs. This is especially critical on **side bottom drain flanges**.
 - 4. After making pipe connections, load the tank 1/4 to 1/3 full of water. While loaded, shim under the hold down lugs just filling the void and then tighten the anchor bolts. Any suitable hard, long lasting material such as steel or stainless plate should be used. Do not tighten the anchor bolts without shimming under the lugs to avoid damaging stresses on the tank.



Alternate Installation Method

When the tank is destined to be placed on a concrete pad, the preparation of the pad is very important. First, there must be no rocks, debris on the pad. Insure that none of these items exist, and the pad is swept clean.

At this time, prior to the deposit of the tank onto the pad, it is recommended that a wet sloppy grout be used.

The grout must be very sloppy, such that it could be poured easily from a five gallon bucket. The grout is only placed in the outer 1' width at the perimeter of the tank. As an example, if the tank is 10' diameter, then there is no grout in an 8' diameter area.

The grout is towelled to a total thickness of 1-2", tapering to nothing towards the center of the pad.

Place the tank in its required position, and release all spreader bar tension. In the event that wind or other external loads could cause the tank to tip over, keep these restraints in place.

After placement, the tank is filled at least two feet deep with water. This causes the tank to settle into the grout.

The squeezed out grout is removed, and the grout must not come out past the tanks perimeter. The grout around the anchor lugs must be tapered down from the lug to the concrete base. It is imperative that the gap between the bottom of the anchor lugs and the concrete base be filled with sand grout to prevent upward movement at the area.

At this time, it is recommended to install the anchor bolt system. Drill holes and install the epoxy anchors, or interference anchors, as recommended. Do not tighten the anchors such that you place a load on the anchor lugs. After grout is cured, the anchor bolts may be torqued snugly, but not to exceed 10 ft-lbs.

FITTING ATTACHMENTS:

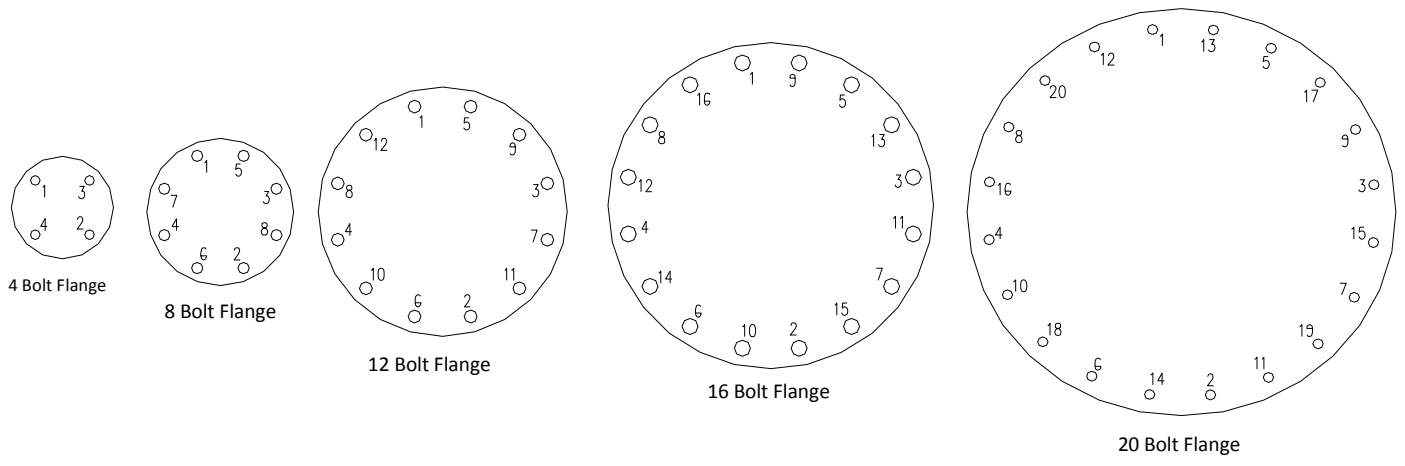
- A. Fiberglass Nozzles have standard ANSI B16.5, Class 150 hole patterns.
- B. For nozzles 1" to 12", a maximum torque of 25 ft-lbs. is recommended with a 60 durometer gasket (1/8" thick).
- C. For nozzles 14" to 16", a maximum torque of 30 ft-lbs is recommended with a 60 durometer gasket (1/8" thick).
- D. For nozzles 18" to 20", a maximum torque of 35 ft-lbs is recommended with a 60 durometer gasket (1/8" thick).
- E. For 24" nozzles, a maximum torque of 40 ft-lbs is recommended with a 60 durometer gasket (1/8" thick).
- F. For 24" manways, a maximum torque of 60 ft-lbs is recommended with a 60 durometer gasket (1/8" thick).

FLANGE BOLTING RECOMMENDATIONS:

- A. Inspect the flange-sealing surface. Check for dents, scratches or corrosion. Be sure that the finish is adequate for the style of gasket being used.
- B. Inspect the gasket. Verify to be sure the gasket material is compatible with the intended service. Check for defects and shipping or storage damage.
- C. Inspect and clean bolts, nuts and washers.
- D. Lubricate bolt threads and the nut contact surfaces. Do not install the bolts and nuts without lubrication. The lubricant should be compatible with the service temperature.
- E. For flanges installed vertically, installation is started by the bolts on the lower part. Install the gasket then the other bolts.



- F. Tighten the bolts approximately 30% of the final torque following the sequence shown in the diagrams below. Number the bolts to facilitate following the tightening order. If the correct tightening sequence is not followed, the flanges may be misaligned, making it impossible to have a uniform seating of the gasket.
- G. Repeat step F, elevating the torque from 50% to 65% of the final value.
- H. Continue tightening in the recommended sequence until the final value is reached. The same bolt normally has to be tightened more than once.
- I. All gaskets relax after seating. Retightening is recommended 24 hours after installation to compensate for the relaxation.





FIELD INSTALLATION OF A REPLACEMENT SIDE MANWAY GASKET

- A. Make certain that the flange face and blind are clean. This may require removal of old gasket remnants which may be difficult. Acetone may be useful in addition light scraping with a putty knife. It is **extremely important** that no surface be scratched in the process of removing the old gasket.
- B. Inspect the gasket. Verify to be sure the gasket material is compatible with the intended service. Check for defects and shipping or storage damage.
- C. After both surfaces are clean and dry it, prepare the blind for positioning of the gasket. Place the blind on a horizontal surface and spray a very small amount of photographic adhesive on the surface of the blind where the gasket will be installed.
- D. Place the gasket on the blind so that the holes in the gasket align with the holes in the blind. It's important to get this alignment as close as possible, because even minor adjustments after it is in place may be difficult depending on how much adhesive was applied.
- E. Finally, install the blind with gasket onto the flange and install bolts and tighten them per the pattern above.

USE LIMITATIONS:

- G. Tanks are sold for a specified chemical storage application. Because other chemical environments may damage the tank, consult FRP Manufacturing (2010) Inc. (FRP) prior to making a change of chemicals.
- H. Standard tanks are not designed for vacuum or pressure other than the liquid head. To prevent accidental pressure or vacuum, the tank shall be positively vented to the atmosphere at all times. The vent shall be as large as the largest inlet or outlet.
- I. Agitators, mixers, coils, and other accessories must be supported as recommended and approved by FRP.
- J. Do not allow stored materials to freeze.
- K. In working around the tank care should be exercised to prevent tools or other objects from striking the tank or being dropped inside the tanks.
- L. Do not gouge, craze, or damage the inside of the tank through misuse of tools. The inner laminate provides the tank's chemical resistance.

STORAGE TANK SAFETY PRECAUTIONS

The following emphasizes some of the precautions while working and operating equipment around FRP tanks.

1. OSHA considers storage tanks as confined spaces. Tanks may have a nitrogen atmosphere lacking adequate oxygen to sustain life. Never enter a tank without following your company's Confined Space Entry Procedure. Always have a partner outside watching through the man-way (holewatch).
2. If the storage tank has any in or out flow of fluids, or any pumps remain connected, verify that all valves and pumps have been turned off and preferably tagged out per your company's safety procedures.
3. While tank is in operation, a vacuum could be formed by drawing down the internal contents faster than they can be replaced. Know what the vacuum rating is of the tank. Always maintain the same number of inches of fluid on the bottom of the tank, which equals this vacuum rating.



4. When draining, be sure adequate venting is allowed to avoid excessive vacuum.
5. Do not stand on tank nozzles.
7. Protect the exterior shell of the tank from deep scratches by forklifts or other such equipment.
8. Do not use storage tanks for any other contents than what is specified on the data label.
9. FRP Mfg. product storage tanks are not to be used for transporting material.

When in doubt, call FRP Manufacturing (2010) Inc. at **306-329-4884**.