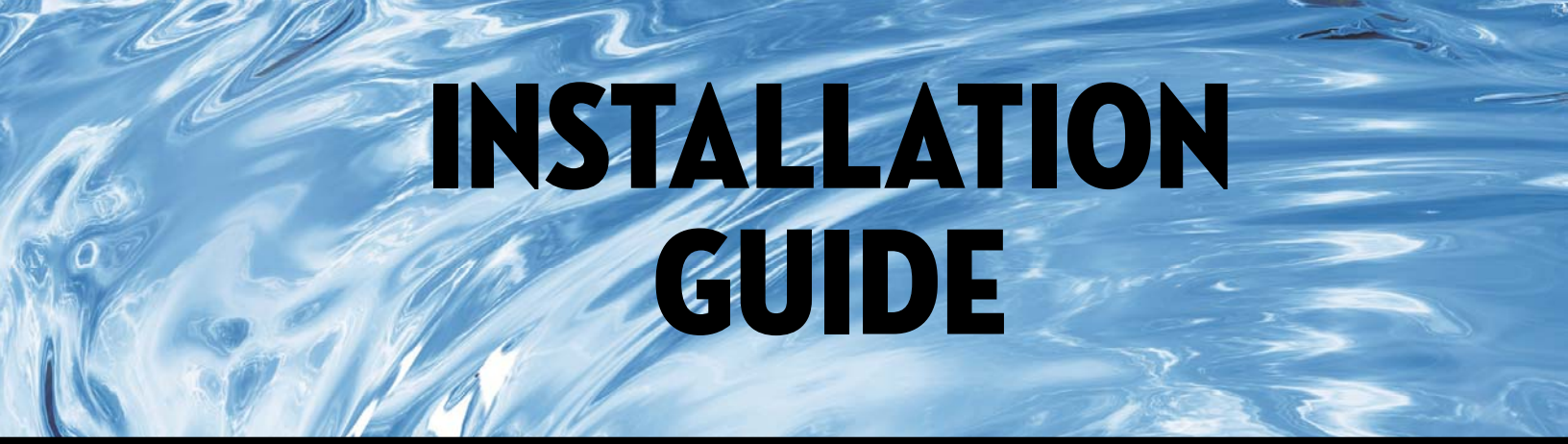


INSTALLATION GUIDE

A READY REFERENCE FOR DISTRIBUTORS, CONTRACTORS AND END USERS.

PROTECT YOUR WARRANTY - READ THESE INSTRUCTIONS

Thank you for making us your chosen tank supplier!

40 years in the tank business has taught us that proper installation is the key to long-term, trouble-free tank service. Please study and use the information contained in this manual. It will make a tremendous difference in the useful life of your tank.

PolyProcessing
SOLUTIONS, SIMPLIFIED.
866-590-6845

TABLE OF CONTENTS

GENERAL INFORMATION

- **Installation:** Hydro test (water test) tank system for 24 hours before introduction of chemical. If necessary, remove all test water to prevent reaction with chemical stored.

- **Heat Maintenance Systems:** Two thermostats are furnished, one for control and one for high limit; heating requirements vary depending on maintenance temperature, ambient temperature, and wind conditions.

- **Polyurethane Insulation with Mastic Coating:** 2" nominal thickness, density range 2 – 2.8 lbs / cubic foot, R value ≥ 6.3 / inch, mastic coasting is white acrylic vinyl.

- **Nominal / Working Capacity:** Calculated vertical tank capacity is to top of straight sidewall.

- **ASTM D 1998 Standard:** All vertical, IMFO®, and SAFE-Tank® systems greater than 500 gallons are manufactured in accordance with ASTM D 1998 standards.

- **Gallonage Markers:** Approximate indicators are not intended for precise measuring or metering. Fill vertical tanks and cones only to top of sidewall.

- **Support hoses, piping and valves** independent of tank sidewall and dome. Flexible connections must be used to protect your tank warranty! See page 12. Shield all fittings, valves, and piping from physical impact and to protect personnel from chemical spray or release.

- **Tank Foundation:**

    - Place tank on a clean, smooth, and properly designed concrete foundation or in PPC approved support assembly. Ensure NO trash of any kind is trapped between the tank and its foundation or support.

    - **IMFO® tank** – use a PPC polyethylene pad or a monolithic concrete pad with finished edges to elevate bottom of tank above primary floor surface. The pad must be at least 4" thick to provide full clearance for the IMFO® flange. At the IMFO® location, the straight wall of the tank must align with the straight wall of the foundation to prevent stress. DO NOT use a polyethylene pad when storing fluids with a specific gravity greater than 1.65.

    - General guideline to accommodate restraint clips and ladders:
        - Make foundation 2 feet larger in diameter than the diameter of the tank.
        - If using the **IMFO®** tank, provide a "notch" in the foundation to accommodate the **IMFO®** outlet.
        - If tank will have fixed ladder, include adequate landing for the ladder to prevent injury.

WARNING: Failure to provide proper foundation support constitutes a misuse of the tank and will void your warranty!

PRODUCT SPECIFICATIONS

- **Temperature:** Tank specific gravity ratings are based on continuous product operating temperature of 100°F. For temperatures between 100°F and 150°F, please contact Customer Support.

- **Pressure:** Polyethylene tanks are designed and rated for **atmospheric pressure only**. Proper venting alleviates pressure or vacuum from developing as the tank is filled and emptied. See venting table below for proper configuration. Also shown on page 11.

<table>
<tr><td colspan="10">Venting Requirements for Polyethylene Tanks</td></tr>
<tr><td>Mechanical Pump Fill</td><td colspan="9">Pneumatic Fill</td></tr>
<tr><td>IF ≤ 1000 gallons</td><td colspan="3">IF—Vent length ≤ 3 feet</td><td colspan="3">IF—Vent length > 3' and ≤ 30'</td><td colspan="3">IF—Scrubber Application</td></tr>
<tr><td rowspan="2">Vent size should equal size of largest fill or discharge fitting</td><td colspan="3" rowspan="2">AND—Vent screen mesh size ≥ 1/4" or no screen used</td><td colspan="3" rowspan="2">And—3 or less 90° elbows with no other restrictions or reduction in pipe size</td><td colspan="3">Vent pipe size throughout scrubber system CANNOT be reduced!</td></tr>
<tr><td colspan="3">Centerline of dispersion pipe not to be submersed > 6 inches</td></tr>
<tr><td>IF > 1000 gallons</td><td colspan="3">Emergency Pressure Relief Cover Required</td><td colspan="3">Emergency Pressure Relief Cover Required</td><td colspan="3">Perforated dispersion pipe must be same diameter or larger, as vent. Sum of perforations ≥ cross sectional area of pipe</td></tr>
<tr><td rowspan="4">Vent size should exceed the largest fill or discharge fitting by 1 inch min</td><td>Tanker Discharge</td><td>Inlet/ Fitting Size</td><td>Minimum Vent Size</td><td>Tanker Discharge</td><td>Inlet/ Fitting Size</td><td>Minimum Vent Size</td><td>Tanker Discharge</td><td>Inlet/ Fitting Size</td><td>Minimum Vent Size</td></tr>
<tr><td>2"</td><td>2"</td><td>4"</td><td>2"</td><td>2"</td><td>6"</td><td>2"</td><td>2"</td><td>6"</td></tr>
<tr><td>3"</td><td>2"</td><td>6"</td><td>3"</td><td>2"</td><td>6"</td><td>3"</td><td>2"</td><td>8"</td></tr>
<tr><td>3"</td><td>3"</td><td>6"</td><td>3"</td><td>3"</td><td>8"</td><td>3"</td><td>3"</td><td>10"</td></tr>
</table>

(2) 2 inch vents DO NOT EQUAL 4 inch venting capacity Rev. Nov. 2006

For detailed venting guidelines, please visit our Technical Resources at www. polyprocessing.com

- **Flexible Connections** allow for tank expansion / contraction and reduce pump / piping vibration stresses. **Flexible connections are required on any fitting connection on the lower 1/3 sidewall of the tank to preserve your warranty**. See page 12. Shield all fittings, valves, and piping from physical impact and to protect personnel from chemical spray or release.

- **Tank Dome Loading: DO NOT** stand or work on top of tank. The tank surfaces are flexible and slippery and a dangerous fall could occur. There is no weight or load rating for the domes of tanks.

LOCATE THE TANK IN A SAFE PLACE

- ☐ **Locate the tank wisely.**

  - Minimal employee and equipment traffic near tank
  - Safe distance away from heat, flames
  - Ease of future maintenance and inspection
  - Ability to remove and replace tank cost effectively in the future. (Do not "trap" tank in building or by other equipment)

- ☐ Incorporate **chemical manufacturer's "best practices"** for product being stored.

- ☐ Provide **flat, level, and smooth monolithic foundation** adequate for weight of chemical to be stored.

- ☐ Utilize **secondary containment** of proper size and chemical resistance to comply with local, state, and federal regulations. The SAFE-Tank® system is designed to provide a minimum of 110% secondary containment.

- ☐ Place **valves** as **close to tank** as possible.

- ☐ Be sure **valves** can be **easily accessed**.

- ☐ Utilize **flexible connections** to allow tank to expand and contract and for protection from pump vibration. See page 12.

- ☐ **Adequately support** valves, piping, and hoses.

- ☐ **Use guards, shields, barriers, and walkways** to protect tank, fittings, and piping from damage by impact and to protect personnel from chemical release.

- ☐ **Vent tanks** to prevent pressure or vacuum. Follow PPC venting guidelines.

WARNING: Read and follow the safety precautions and instructions on these checklists and throughout the manual. Failure to comply can result in serious property damage, injury or death, or reduced useful life of the tank. Failure to adequately support tank, fittings, valves, piping, and hoses and to protect them from impact can cause chemical release resulting in serious injury or death.

RECEIVING MERCHANDISE

RECEIVING:

- **Inspect immediately** upon receipt for obvious damage, defects, or missing parts and accessories.
- **Parts and accessories** are often secured and/or shipped inside the tank. Locate and open packages to account for all parts using the packing slip.
- **Note damage/discrepancies** on the driver's copy and the packing slip and have the driver initial.
- **Immediately notify** your Authorized Distributor or Poly Processing Company of any problems.
- **DAMAGED/MISSING MERCHANDISE:** Report damaged/missing merchandise within THREE (3) working days to ensure your claim. Your authorized distributor and/or Poly Processing Company can assist you with this process.

Poly Processing Customer Support

Monroe, Louisiana
866.590.6845

French Camp, California
877.325.3412

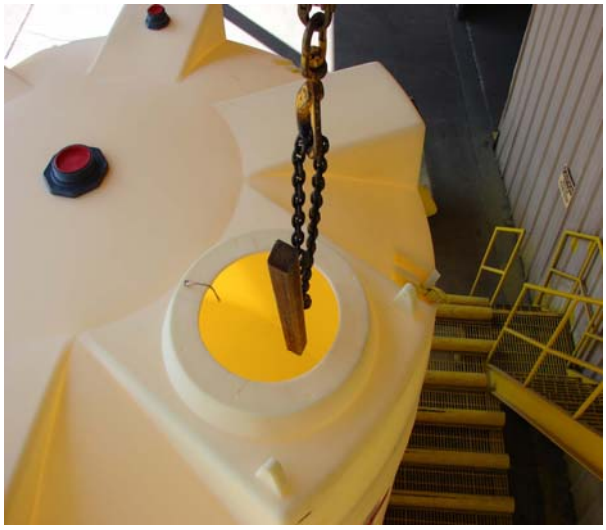
RETURNING MERCHANDISE

- **To return <u>unused</u> merchandise** for proper credit:
    - Contact your authorized distributor or Poly Processing Customer Support and obtain a PPC Return Merchandise Authorization (RMA) number. Have your packing slip available for any needed information.
    - Use the RMA number on all return shipping paperwork and all correspondence.
    - Return the merchandise **prepaid.** Freight collect shipments will be refused.
    - Upon receipt, PPC will inspect the merchandise and issue appropriate credit. A restocking fee may be assessed, particularly on products "made to order".
- **To ensure employee safety, Poly Processing Company will not accept used tanks at its facilities.**

UNLOADING INSTRUCTIONS

- **Keep personnel clear of tank, rigging, and lift equipment! Improper and unsafe unloading can result in property damage, serious injury, or death.**
- DO NOT STAND OR WORK ON TOP OF TANK. The tank surfaces are flexible and slippery and a dangerous fall could occur. There is no weight or load rating for the domes of tanks.
- **Use of Lifting Lugs:**
    - Stand tank vertical. If tank has IMFO® outlet, block under tank to protect IMFO®. See page 17 for flange support example.
    - **Consult the tank drawing for the proper number of molded-in lifting lug sets to use during a lift.** Two molded lugs constitute a set. See picture below.

- **Use of Manway:**
    - Use a lifting device as shown below. The bar should be a minimum 3" in diameter, have adequate strength for the load, and range in length from 42" to 46".



- **Use of Forklift:**
    - Ensure the forklift tines are **smooth and free from burrs.**
    - Use **extended tines** if handling a large tank.
    - **Tie the tank** to the forklift mast to prevent rolling or sliding.

INSTALL THE TANK IN A SAFE MANNER

- ☐ Incorporate **chemical manufacture's "best practices"** for product being stored.
- ☐ Polyethylene tanks are **HEAVY**.
  - Use adequate equipment and properly trained personnel to off load and place tanks in final position.
  - Keep personnel clear of tanks when they are being lifted.
  - Fully drain tanks before lifting.
- ☐ Accessory items are **HEAVY**. Use adequate equipment and properly trained personnel to off load and install internal pipe stabilizers, emergency vent lids, ladders, and other accessory items.
- ☐ **DO NOT STAND OR WORK ON TOP OF TANK**. The tank surfaces are flexible and slippery and a dangerous fall could occur. There is no weight or load rating for the domes of tanks.
- ☐ **Tanks are confined spaces**. Follow proper entry procedures. Establish an adequate retrieval plan.
- ☐ **Confirm compatibility of tank, fittings, and gaskets** for chemical to be stored **before** permanent installation. If necessary, test the tank, fitting, and gasket materials of construction for compatibility with the specific chemical application.
- ☐ Place **valves** as **close to tank** as possible.
- ☐ Be sure **valves** can be **easily accessed**.
- ☐ Install **flexible connections** to allow tank to expand and contract and for protection from pump vibration. See page 12.
- ☐ **Adequately support** valves, piping, and hoses.
- ☐ Install **guards, shields, barriers, and walkways** to protect tank, fittings, and piping from damage by impact and to protect personnel from chemical release.
- ☐ **Vent tanks** to prevent pressure or vacuum. Follow PPC venting guidelines.
- ☐ **Properly secure ladders top and bottom**. Use adequate lifting equipment and fall protection equipment when installing to protect personnel.
- ☐ **Label tank with the appropriate warning label for the particular chemical to be stored.** Do not remove Poly Processing's general warning labels. Replace damaged or illegible labels immediately.
- ☐ **Hydro test** the tank for at least 24 hours prior to loading with chemical.

WARNING: Failure to adequately support tank, fittings, valves, piping, and hoses and to protect them from impact can cause chemical release resulting in serious injury or death.

USE AND SERVICE THE TANK IN A SAFE MANNER

- ☐ **Hydro test** (water test) tank system for 24 hours before introduction of chemical. If necessary, remove all test water to prevent reaction with chemical stored.
- ☐ Follow **chemical manufacture's "best practices"** for product being stored.
- ☐ **Confirm compatibility of tank, fittings, and gaskets** for chemical to be stored **before** permanent installation. If necessary test the tank, fitting, and gasket materials of construction for compatibility with the specific chemical application.
- ☐ Obtain, utilize and retain **Material Safety Data Sheets** (MSDS) for the chemical to be stored.
- ☐ **Do not change chemical being stored** unless certain there will be no hazardous chemical reaction.
- ☐ **Fill vertical tanks only to top of sidewall.**
- ☐ **Prevent over pressurization of tank** during pneumatic or mechanical filling. See "VENTING" on page 5 or 11.
- ☐ **Prevent excessive heat** near or inside the tank. Polyethylene tanks are designed for a maximum continuous temperature of 100°F.
- ☐ Maintain **secondary containment** of proper size and chemical resistance to comply with local, state, and federal regulations. Protect personnel from possible chemical release. The SAFE-Tank® system is designed to provide a minimum of 110% secondary containment.
- ☐ Maintain **guards, shields, barriers, and walkways** to protect tank, fittings, and piping from damage by impact and to protect personnel from chemical release.
- ☐ **Label tank with the appropriate warning label for the particular chemical to be stored.** Do not remove Poly Processing's general warning labels. Replace damaged or illegible labels immediately.
- ☐ **Keep vents and vent lines clear** of obstructions to prevent pressure or vacuum.
- ☐ **Service fume scrubber systems** to prevent tank over pressurization.
- ☐ Accessory items are **HEAVY**. Use adequate equipment and properly trained personnel when servicing internal pipe stabilizers, emergency vent lids, ladders, and other accessories.
- ☐ **DO NOT STAND OR WORK ON TOP OF TANK**. The tank surfaces are flexible and slippery and a dangerous fall could occur. There is no weight or load rating for the domes of tanks.
- ☐ **Tanks are confined spaces**. Follow proper entry procedures. Establish an adequate retrieval plan.
- ☐ **Conduct annual inspections** of tank. **See inspection guide on page 31**. Look for and address stress cracking, especially on **interior** surface, worn or leaking fittings and flex connections, leaking or poorly working valves, restricted vent lines, and needed repairs to ladders, stabilizer brackets, stands, and other accessories.

WARNING: Failure to adequately support tank, fittings, valves, piping, and hoses and protect them from impact can cause chemical release resulting in serious injury or death.

Venting Requirements for Polyethylene Tanks									
Mechanical Pump Fill	Pneumatic Fill								
IF ≤ 1000 gallons	IF—Vent length ≤ 3 feet			IF—Vent length > 3' and ≤ 30'			IF—Scrubber Application		
Vent size should equal size of largest fill or discharge fitting	AND—Vent screen mesh size ≥ 1/4" or no screen used			And—3 or less 90° elbows with no other restrictions or reduction in pipe size			Vent pipe size throughout scrubber system CANNOT be reduced!		
							Centerline of dispersion pipe not to be submersed > 6 inches		
IF > 1000 gallons	Emergency Pressure Relief Cover Required			Emergency Pressure Relief Cover Required			Perforated dispersion pipe must be same diameter or larger, as vent. Sum of perforations ≥ cross sectional area of pipe		
Vent size should exceed the largest fill or discharge fitting by 1 inch min	Tanker Discharge	Inlet/ Fitting Size	Minimum Vent Size	Tanker Discharge	Inlet/ Fitting Size	Minimum Vent Size	Tanker Discharge	Inlet/ Fitting Size	Minimum Vent Size
	2"	2"	4"	2"	2"	6"	2"	2"	6"
	3"	2"	6"	3"	2"	6"	3"	2"	8"
	3"	3"	6"	3"	3"	8"	3"	3"	10"

(2) 2 inch vents DO NOT EQUAL 4 inch venting capacity

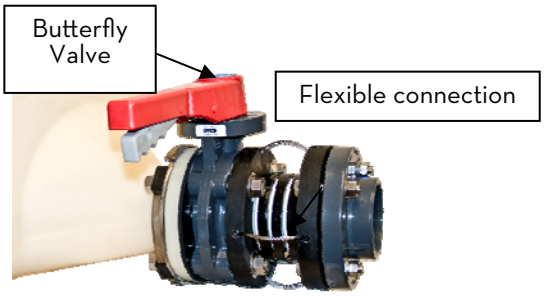
Rev. Nov. 2006

For detailed venting guidelines, please visit our Technical Resources at www. polyprocessing.com

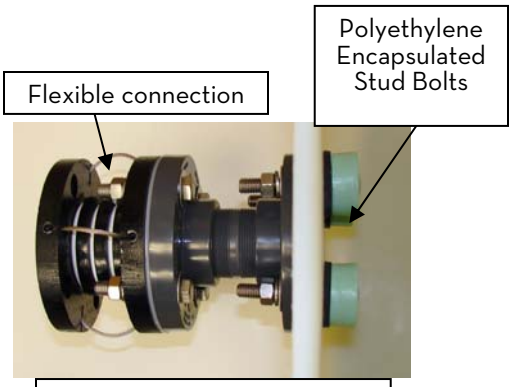
FLEXIBLE CONNECTIONS

Flexible connections are required on fittings installed on the lower 1/3 of the tank sidewall to allow the tank to expand and contract and to protect the tank from pump vibrations.

1. Install flexible connection in accordance with the specific manufacturer's installation guidelines:
   a. The "breech opening" in the piping for the flexible connection should be within 1/8" of the relaxed length of the flexible connection.
   b. Flexible connections are not to be used for correcting piping misalignment. The flexible connection and mating flanges must be installed in a centered and neutral position.
   c. Attach only FULL FACE flanges to the flexible connection. They are not designed to attach directly to tank wall.
   d. Ensure adequate clearance between bolt ends for full use of flexible connections.
   e. Torque to 20 ft. lbs using crisscross tightening pattern.
   f. Provide pipe support adjacent to the flexible connection.



Flexible connection installed on IMFO® flange



Flexible connection installed near tank sidewall

Flexible Connection Minimum Specifications:

1. Axial Compression ≥ 1.5"
2. Axial Extension ≥ 0.625"
3. Lateral Deflection ≥ 0.750"
4. Angular Deflection ≥ 14°
5. Torsional Rotation ≥ 4°

2. Installation of flexible hose connections:
   a. Use thread sealant for pipe thread preparation.
   b. Support hose adequately but do not restrict its ability to move in horizontal directions.

SAFE-SURGE® EMERGENCY AIR SURGE PROTECTION

To install:

1. SAFE-Surge® lids are HEAVY. Use lifting equipment to place the SAFE-Surge® lid over the tank manway.
2. Rotate the lid until the warning label is next to the edge of the tank.
3. Secure the lid with the polyethylene bolts provided.
4. Make certain the movement of the center cap of the lid is unrestricted and able to open to relieve pressure build-up in the tank.

WARNING: SAFE-Surge® lids are heavy (22 lbs.) and awkward! DO NOT attempt to use a ladder for installing the SAFE-Surge® lid. The ladder may become unstable and lead to a fall or injury! Use lift equipment appropriate for work environment or use scaffolding and hoisting equipment.

BELLOWS TRANSITION FITTING

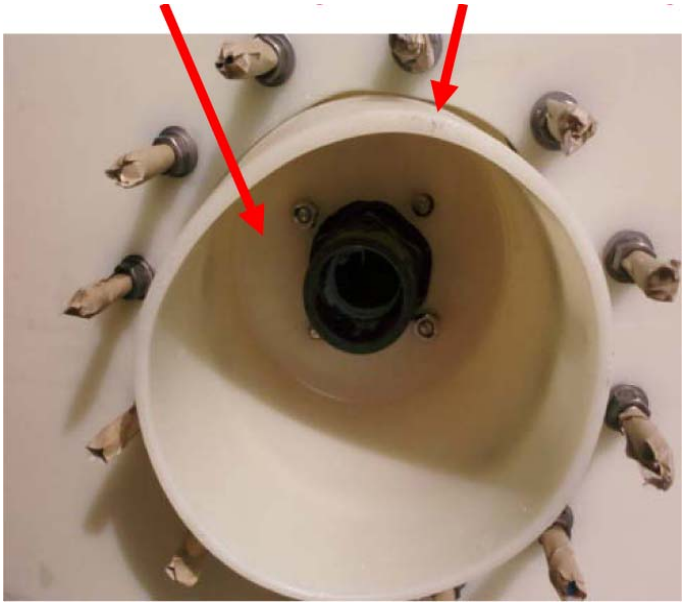
Introduction and Warning

These instructions are intended to make your transition fitting installation and maintenance trouble free. Read them carefully and identify all parts before starting your installation. Follow all general safety practices and your company specific safety practices.

Inner and Outer Tank Alignment

The design of the alignment sleeve is to ensure that your tank arrives without any alignment issues. In the event that a misalignment does occur during shipment or set up, please contact the manufacturer for instructions.

Nuts and Alignment Sleeve



WARNING: The SAFE-Tank® system is designed to provide a minimum of 110% secondary containment. Once the transition fitting is installed, a leak in the inner tank will result in product collection between the inner and outer tank. If this product is not drained off prior to breaking the seals of the transition fitting, serious property damage, injury or death may occur. Great care must be taken to protect people and property when working with a transition fitting.

Filling and Testing Inner Tank

1. Attach flexible connection assembly to inner tank fitting. (Do not install bellows at this time.) If the connection is a solvent weld, allow adequate dry time.
2. Cap or plug all inner tank sidewall fittings and fill the inner tank with water to top knuckle. Make sure you provide support to the flexible connection during the hydro test. Allow the tank to remain full for 12 to 24 hours. This allows:
   - The inner tank to fully seat itself in the outer tank.
   - The inner tank to fully expand without stressing the inner tank flange and recently installed flexible connection assembly.
   - Detection of any leaks in the inner tank created during shipping and handling.
   - Detection of any leaks between the inner tank flange and recently installed nipple.
3. Determine if any leaks are occurring by using the outer tank access hole to look for water collecting in the space between the inner and outer tank. Correct any problems. Leaks cannot always be visually detected once the transition fitting is installed!

Assembly of the Transition Fitting

Loose parts boxed for shipment

Remove nuts and alignment sleeve before beginning

Confirm proper alignment

Glue PVC pipe/flexible connection assembly to inner tank fitting

Install gasket for bellows

Install bellows and SS Back Rings

Glue BHF

Install Outer Face Plate and SS Back Ring

Tighten nut on BHF (left hand threads)

Finished Assembly

Tightening/torque criteria:

- Steel bolts/stud bolts: progressively tighten in crisscross pattern to 20 ft lbs max.
- PVC BHF Nut: Hand tighten plus 1/4 turn with a wrench.

RECOMMENDED TORQUE VALUES

ALWAYS:
1. Lubricate bolts with anti-seize compound prior to installing nuts.
2. Tighten the nuts in a crisscross pattern using a torque wrench. Tighten in 5 ft. lb. increments.

Fitting	Torque
PVC Bolted Flange	15-20 ft. lbs.
CPVC Bolted Flange	15-20 ft. lbs.
PP Bolted Flange	15-20 ft. lbs.
Stainless Steel Bulk Head	30 ft. lbs.
B.O.S.S.® Fitting	15-20 ft. lbs.
Bellows Transition Fitting	15-20 ft. lbs.
IMFO® Flange Fitting	15-20 ft. lbs.
Flexible Connections	15-20 ft. lbs.
PVC Bulkhead Fitting	1/4 turn beyond hand tight

IMFO® FLANGE FITTING ASSEMBLY

1. The IMFO® (Integrally Molded Flanged Outlet) is assembled at the PPC plant sites and hydro tested to ensure proper seal.
2. There are two types of IMFO® back up rings.

Tapered IMFO® w/ Steel Back-up Ring

Original IMFO® w/ Plastic Back-up Ring

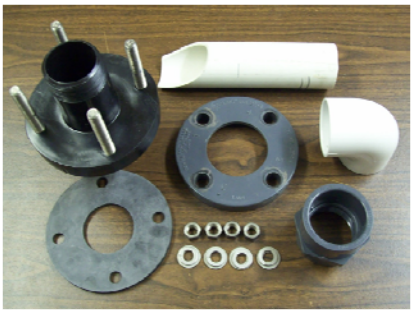
3. DO NOT disassemble the factory installation. If field replacement is necessary, use picture as a guide.
4. Protect the IMFO® flanged nozzle when storing and installing. When storing, the tank can be stood upright with adequate blocking or laid on its side and chocked to prevent rolling.

CORRECT STORAGE. Notice clearance of flange above the floor.

B.O.S.S.® (Bolted One-Piece Sure Seal) FITTING ASSEMBLY

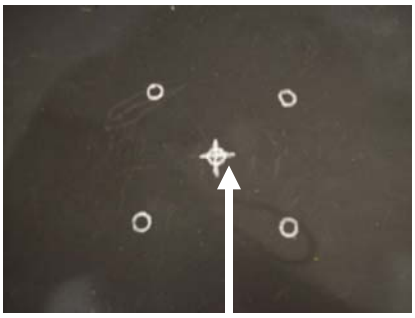
While the B.O.S.S.® fitting was designed for OR-1000™ systems, it also provides value on the non OR-1000™ systems as it eliminates 4 potential leak points when compared to other fittings.

Loose parts boxed for shipment



2 inch model shown with optional siphon leg

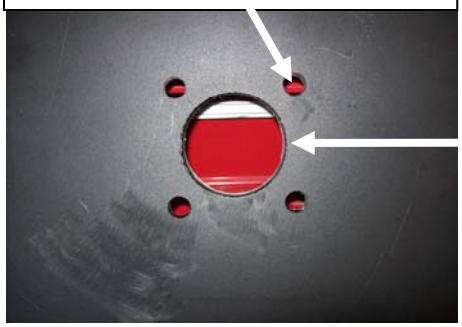
Drill layout on outside of tank



Fitting size	Hole saw size
1”	1 1/2”
2”	2 5/8”
3”	3 5/8”

Once the tank is marked properly, drill the center hole and stud holes with a 1/4” pilot bit. Be precise with the layout and drilling of the tank as the fitting requires close tolerances.

Drill 5/8”hole’s for the stud bolts.



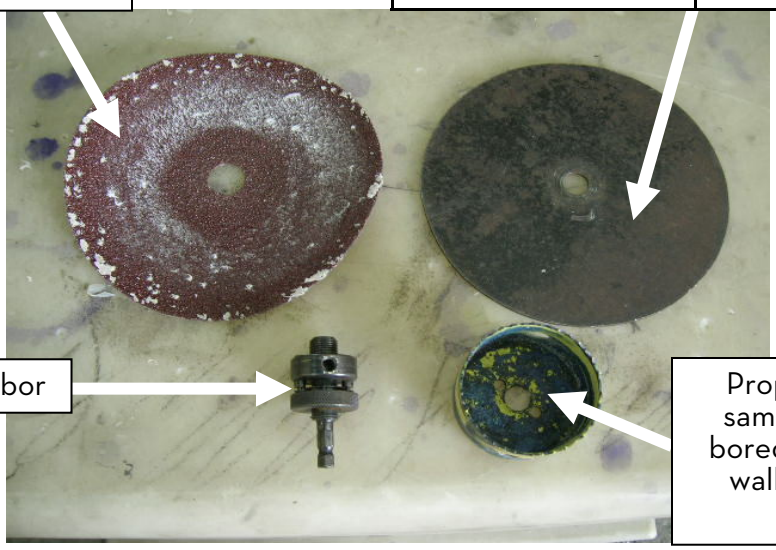
Drill the center hole using the proper size hole saw. Do not drill this hole larger than needed to maintain adequate sealing surface. Clean and bevel all drilled and cut holes on the inside and outside of tank surfaces.

Inside of tank must be flat and smooth. If the inner surface is uneven or lumpy, the inner wall must be faced smooth using a drill with sandpaper attached to a steel plate. All surfacing must be done in a circular manner.

Surfacing Tools:

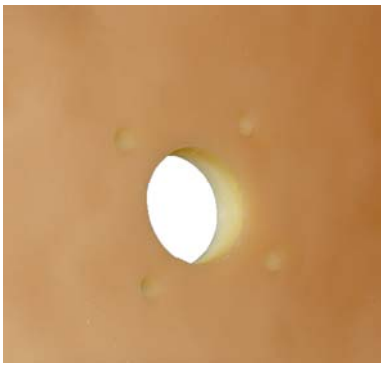
Steel backing plate for sanding disc to ensure even pressure.	
Fitting size	Plate size
1"	4 1/2"
2"	6"
3"	7 1/2"

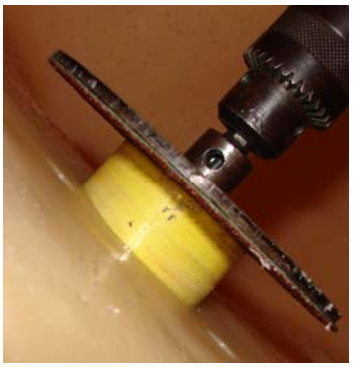
24 grit grinding disc, slightly larger in diameter than the flange face of the fitting.



Drill Arbor

Proper hole saw, the same size as the hole bored through the tank wall to use as a pilot

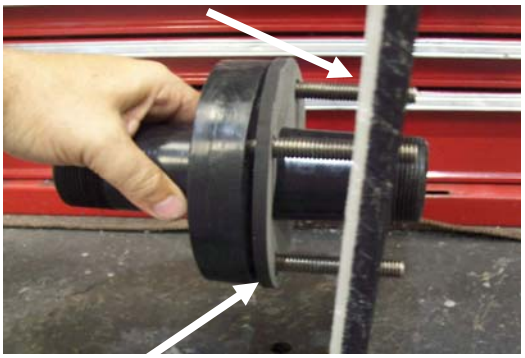




Make sure drill is flat against the tank wall while surfacing.

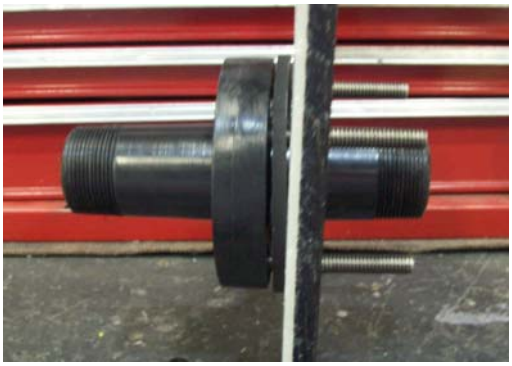
Once all drilling and surfacing is complete, install the fitting from the inside of the tank as shown in the photo's below.

Inside of tank

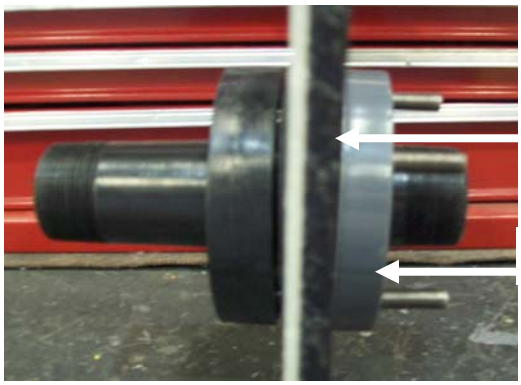


Gasket

B.O.S.S.® fitting placed in tank, sealing surface on the inside of tank



Place plastic ring over the studs on the outside of the tank.

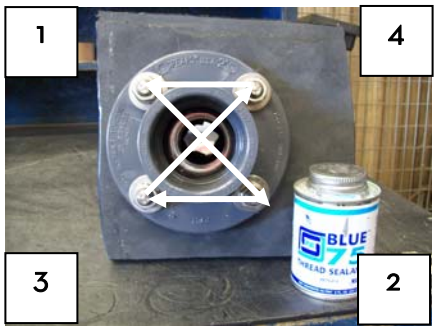


Outside of tank

Plastic ring

Add flat and lock washers, apply a small amount of anti-seize compound, and screw the nuts onto the studs

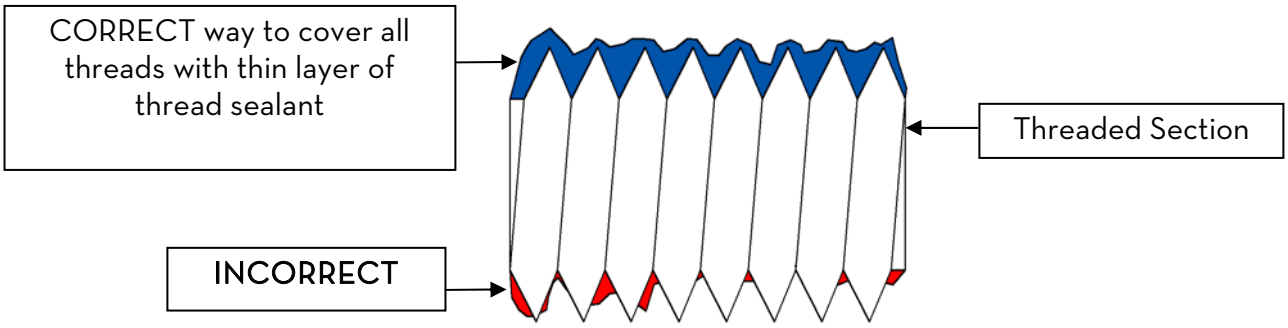
With nuts installed, begin tightening in a crisscross pattern. Tighten in 5 ft. lbs. increments to 20 ft. lbs.



Apply thread sealant applicable for application, (Spears Blue 75 recommended) to the outside nipple of the B.O.S.S.® fitting and install the female adaptor or coupler.

Tighten threaded plastic fittings only 1/2 turn beyond hand tight using a strap wrench.

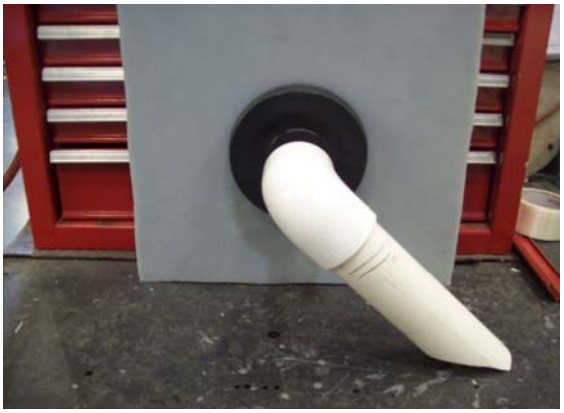
Method for applying thread sealant to threaded fittings:



Adding the optional siphon leg

If the B.O.S.S.® fitting requires a siphon leg, apply thread sealant to the fitting's nipple, and screw on a PVC 90 degree elbow.

After the elbow is in place, measure and cut the appropriate length of PVC pipe and glue it in place.



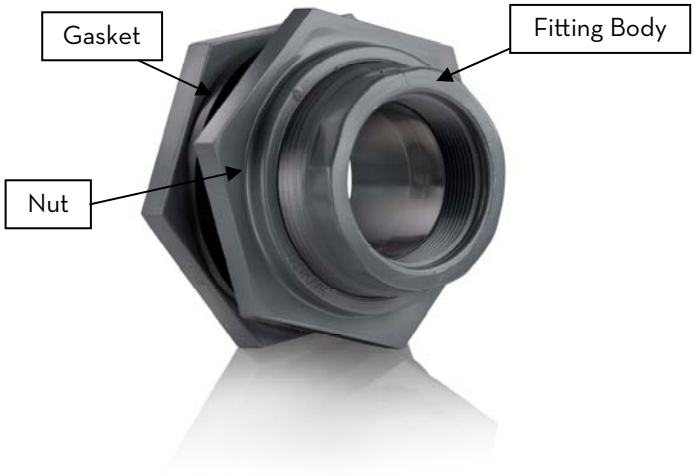
HANDLING NOTE: Once a tank is fitted and ready to be moved, great care must be taken to prevent damage to the fitting. When hydro testing this unit, use inflatable test plugs to block off the fitting.

BULKHEAD FITTINGS

1. Slide the gasket over the body of the fitting.
2. From inside the tank, insert fitting body into hole in tank sidewall.
3. Lubricate threads on fitting body with thread sealant and install large nut on the outside of the tank.
4. Hand tighten plus 1/4 turn with a wrench. Most Bulkhead fittings use left hand threads.
5. Do not allow fitting body to slip or spin when tightening to prevent the gasket from creeping between the fitting and the tank wall.
6. Inspect gasket for creep. If found, loosen nut and perform steps 4 & 5 again.
7. When installing a pipe or flange adapter into the BHF, do not allow BHF to slip and do not over tighten.
8. Hydro test the tank for a minimum of 24 hours before placing into chemical service.

Bulkhead fittings and tank sidewall restrictions:

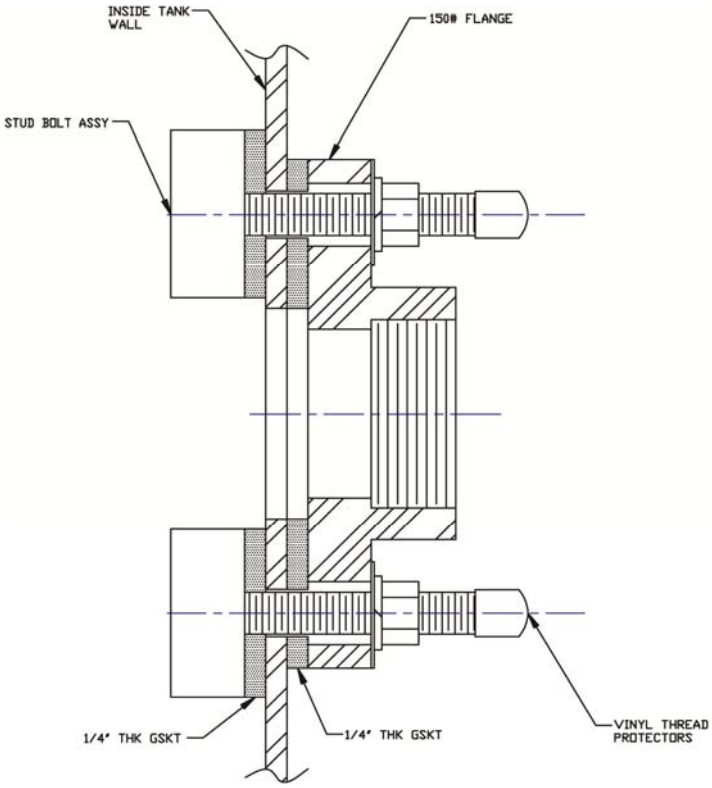
Tank size	BHF's, Tank Sidewall
SAFE-Tank® 160 gallons or less	BHF's up to 2" allowed
SAFE-Tank® 405 gallons and larger	BHF's not allowed
Upright tanks 450 gallons or less	BHF's up to 2" allowed
Upright tanks 451-3000 gallons	BHF's up to 3" allowed
Upright tanks larger than 3000 gallons	BHF's not allowed



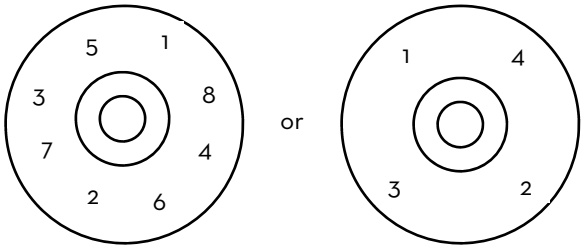
BHF size	Hole saw size
1/2"	1 3/8"
3/4"	1 5/8"
1"	1 7/8"
1 1/4"	2 3/8"
1 1/2"	2 5/8"
2"	3 1/4"
3"	4 1/2"
4"	5 3/4"

BOLTED FLANGE FITTINGS

1. Flanges for pipe sizes 4" and larger should be curved to match the outside diameter of the tank.
2. Disassemble the fittings as shipped. If the holes are not drilled, place the flange against the tank in the desired location and use as a template for drilling the holes. Use a hole saw the same size as the fitting's port.
3. Clean and bevel all drilled and cut holes on the inside and outside of tank surfaces.
4. With the gaskets installed, place the stud bolts through the holes with the plastic head on the inside of the tank; threads on the outside.
5. Place the full face flange gasket over the bolts on the outside surface of the tank.
6. Place the flange over the gasket and stud threads with the hub of the flange facing out.
7. Put a washer and nut on each stud bolt. Be sure to lubricate the threads of the bolts with anti-seize compound.
8. Tighten the nuts in a crisscross pattern using a torque wrench. Tighten in 5 ft. lb increments to 20 ft. lb.
9. Inspect fitting. Gasket must be compressed and the outer flange drawn down evenly.
10. Piping such as a flange adapter should now be threaded into the fitting. Thread sealant should be applied to all pipe threads. Do not over tighten.
11. **Hydro test** the tank for at least 24 hours prior to loading with chemical.



The following tightening sequence is suggested for the flange bolts.

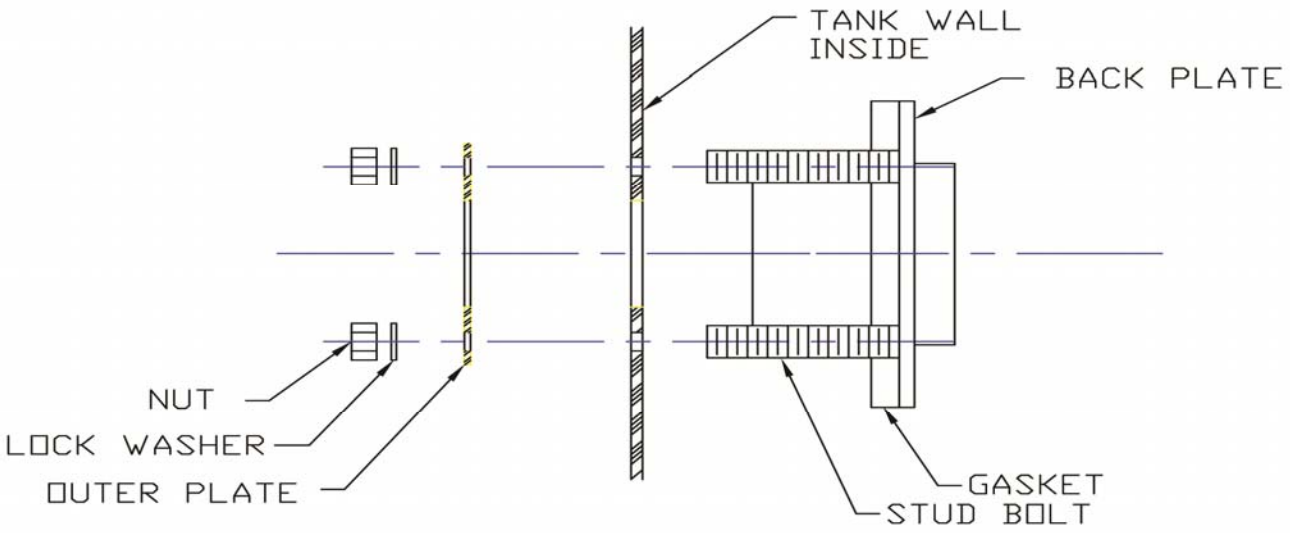


ILLUSTRATION

CAUTION: Over torquing will damage the flange and gaskets.

STAINLESS STEEL FITTINGS

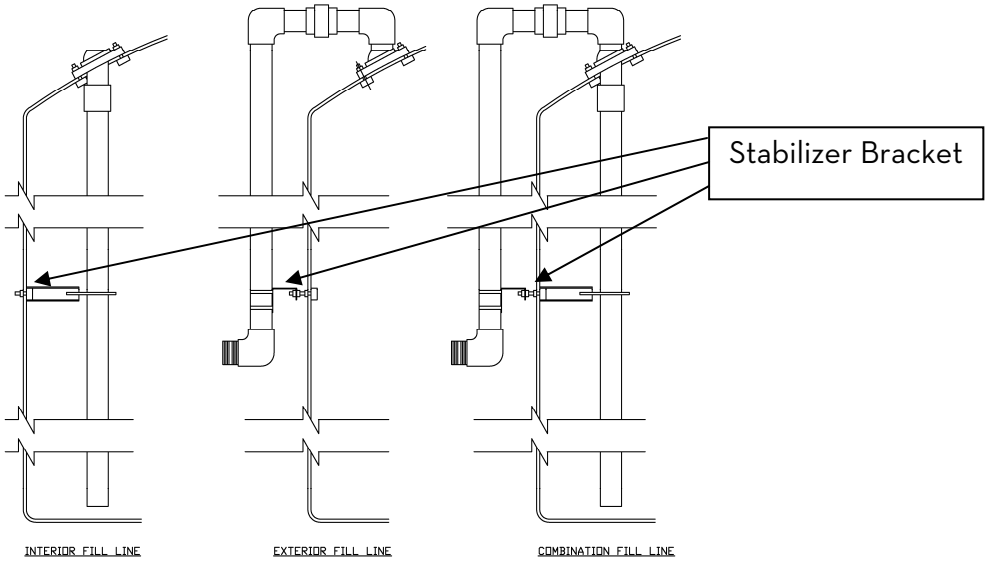
1. Disassemble the stainless steel fitting by removing the nuts from the stud bolts. Remove the 1/8" thick stainless steel outer plate. Set the remainder of the fitting aside along with the nuts and washers.
2. Using the outer plate as a template, mark the bolt holes on the outside of the tank.
3. Find the center of the large "pipe fitting" hole by drawing an "X" through the center of the bolt holes.
4. Drill out the pipe fitting hole using a hole saw. Please note that the hole to be drilled into the tank may be smaller than the hole in the outer plate that was used as a template. The hole drilled should be only slightly larger than the outside diameter of the pipe fitting.
5. Next drill out the stud bolt holes using a 9/16" drill bit for the 1/2" diameter studs.
6. Clean and bevel all drilled and cut holes on the inside and outside of tank surfaces.
7. Install the fitting and gasket from the inside of the tank.
8. Slide the outer plate onto the stud bolts that are protruding on the outside of the tank.
9. Replace the washers and nuts on the stud bolts. Tighten the nuts in a crisscross pattern using a torque wrench. Tighten until the gasket is fully compressed (approximately 30 ft. lbs. on a torque wrench).
10. Inspect the fitting. The gasket should be compressed and the outer stainless steel plate should conform to the wall of the tank.
11. **Hydro test** the tank for at least 24 hours prior to loading with chemical.



ILLUSTRATION

FILL LINE ASSEMBLIES

1. Fill line assemblies are available in 3 styles: internal, external and combination (see drawings below).
2. Your tank system may be equipped with a drop pipe stabilizer bracket which is typically shipped loose and requires simple installation.

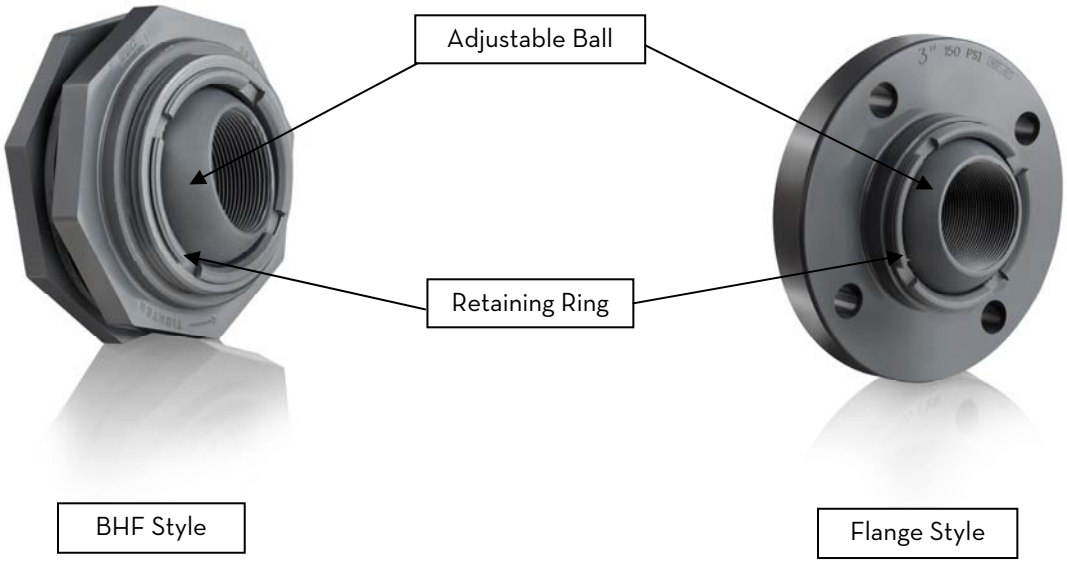


SELF ALIGNING UNIVERSAL BALL DOME FITTINGS

The Self Aligning Universal Ball Dome fittings are designed for **use only on tank domes.** **DO NOT USE ON THE SIDEWALL OF THE TANK!** There are two styles of Ball Dome fittings: Bulkhead Fitting Style and Bolted Flange Style.

1. Do not stand on tank dome when installing dome fittings. Use portable ladders, scaffolding, or personnel lifts with proper fall protection.
2. Install the bulkhead fitting or flange portion of the ball dome fitting according to instructions found on page 22 or page 23.
3. Thread piping into the threaded ball of the fitting. Use thread sealant.
4. Adjust vertical alignment:
    a. Gently loosen the ball retainer ring located on top of the fitting ball using a large blunt screw driver or punch and hammer.
    b. Adjust piping to desired angle.
    c. Tighten retainer ring with blunt screw driver or punch and hammer taking care not to over-tighten!

Universal Ball Dome Fitting



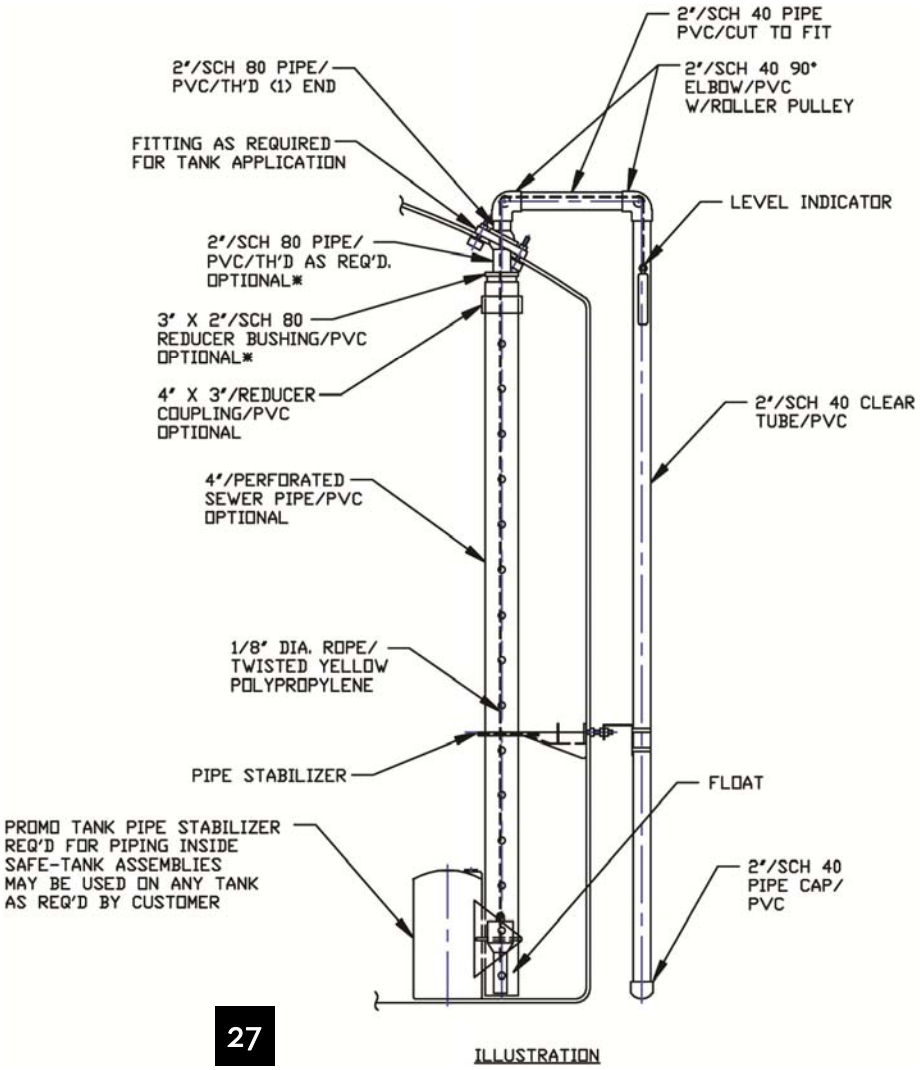
WARNING: Do not stand or work on top of tank. The tank surfaces are flexible and slippery and could cause a dangerous fall to occur. There is no weight or load rating for the domes of tanks.

REVERSE FLOAT LIQUID LEVEL GAUGE

DO NOT USE GLUE FOR ANY OF THE FOLLOWING STEPS!

1. Retrieve exterior portion of gauge from inside the tank.
2. Thread rope through:
   - ° Threaded nipple (for the tank dome fitting)
   - ° Over the top of the rollers in the first 90 degrees elbow
   - ° Short horizontal pipe
   - °Over the top of the rollers in the second 90 degrees elbow
3. Attach rope to level indicator (note: length of rope must be determined during installation).
4. Install threaded nipple into dome fitting.
5. Attach first 90 degree elbow.
6. Attach short pipe.
7. Attach second 90 degree elbow.
8. Place level indicator into clear pipe.
9. Attach clear pipe to 90 degree elbow.
10. Attach clear pipe to external pipe stabilizer.

Periodically lubricate rollers to ensure proper operation!



ILLUSTRATION

SIGHT GLASS LIQUID LEVEL GAUGE

DO NOT USE SIGHT GLASS GAUGES IN SULFURIC ACID OR OTHER DANGEROUS CHEMICAL SERVICE! **Use only in benign applications such as water.**

1. Sight glass assemblies are completed at the factory and shipped loose inside the tank to prevent damage.
2. Separate the unions on either end of the assembly.
3. Screw the two short nipples, with 1/2 of the union, into the sight glass fittings at the top and bottom of the tank.
4. Rejoin the unions on the assembly and tighten carefully.
5. If necessary, install additional valves and/or piping.
6. HYDRO TEST FOR 24 HOURS before placing into chemical service!

Special Notes:

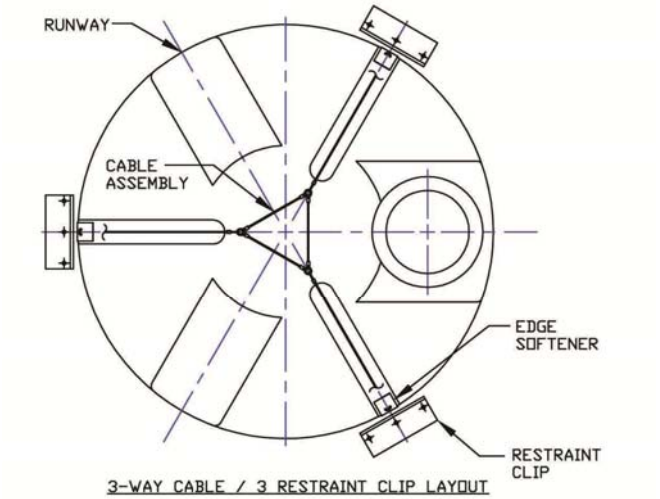
1. The clear tubing will discolor over time due to chemical and UV attack.
2. WARNING: In the event the liquid level gauge is damaged or leaks, it is very likely the entire contents of the tank will be lost! Use only in benign applications such as water.

WARNING: Do not use sight gauges in sulfuric acid or other dangerous chemical service. Loosening of any fittings associated with a sight glass liquid level gauge, may result in a chemical spill and/or property damage, bodily injury, or death.

RESTRAINT SYSTEMS

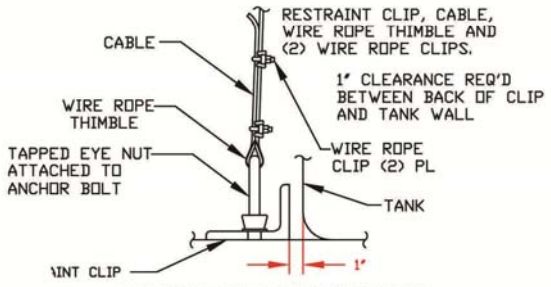
Wind and seismic restraint systems are governed by state and local code. Consult your local code for requirements.

1. Restraint Clips
   a. Space equally around circumference of tank. If tank operating temperatures exceed 100°F, contact Customer Support for proper clip placement.
   b. Allow minimum of 1 inch clearance between tank and back of clip to accommodate tank expansion.
   c. Attach the clips to the foundation with appropriate fasteners (customer supplied).
2. Cable Assembly
   a. Place cable assembly over the tank with the cable sling or tension ring at the top center of the dome.
   b. Pass each cable leg over the upper shell knuckle through the Edge Softener.
   c. Place the wire rope thimble in the eye-nut (Style A) or the hole provided in the restraint clip (Style B) and loop the cable around the thimble.
   d. Install the wire rope clips by forming a loop with the cable end. See instructions included with wire rope clips.
   e. After the cable is attached to the restraint clips, the excess cable slack must be removed. Cable tension should only be snug enough to secure the Edge Softeners against the upper tank knuckle. **Excessive cable tension should be avoided as it may cause undue stress and deformation to the tank.**
   f. After cable tension is properly adjusted, the wire rope clips should be checked for proper tightening.
3. Periodic Inspection
   a. Periodically check cables and wire rope clips to ensure proper but not excessive tension.
   b. Adjust if necessary, following steps e and f above.

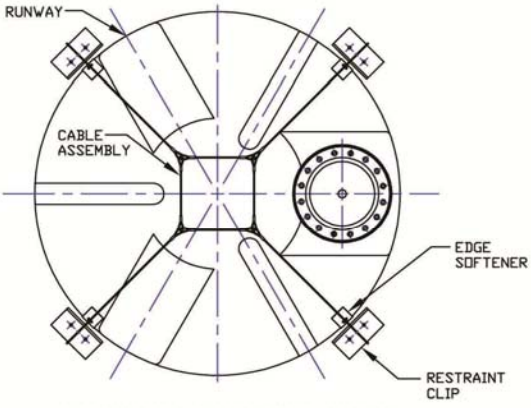


3-WAY CABLE / 3 RESTRAINT CLIP LAYOUT

Style A



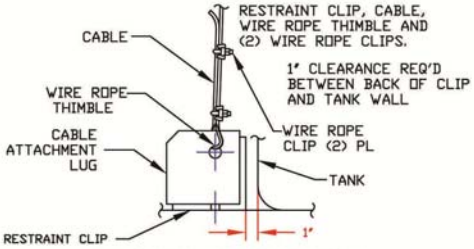
RESTRAINT CLIP/CABLE CONNECTION



4-WAY CABLE / 4 RESTRAINT CLIP LAYOUT

Style B

CABLE ASSEMBLY (ONE LEG SHOWN)



RESTRAINT CLIP/CABLE CONNECTION

HORIZONTAL TANK STANDS

NOTE: Horizontal tank stands are designed to be located on level concrete foundations or other approved surfaces. Tank stands must be bolted to the foundation. Stands for larger horizontal tanks are shipped "knocked down" to minimize freight. Small tank stands do not require assembly.

If working with a stand shipped "knocked down":

1. Check to ensure that the following components have been received:
   a. Vertical leg units
   b. Side angle braces
   c. One bag containing stainless steel tabs and bolts
2. Assemble vertical leg units to side angle braces. Square unit and tighten all bolts.

If working with any stand:

3. Place the stand on a level foundation.
4. Anchor stand to foundation with appropriate bolts. (customer supplied)
5. Center tank and skid on stand.
   a. With a forklift, crane, or other lifting device, place the tank and skid onto the stand, being careful not to damage the skid. Protect hands and fingers from pinch points during this step.
   b. Locate holes in the top of the stand and center the tank and skid unit on the stand.
6. Install the stainless steel tabs and bolts using the holes in the top of the stand per photo below.
7. Hydro test the tank for at least 24 hours prior to loading with chemical.

Tank Size	No. Upright Leg Units	No. Side Angle Braces	No. of Bolt Assemblies	No. of Tabs
520 gal.	stand is welded together			4
1,000 gal.	2	4	14	4
1,950 gal.	3	8	22	6

Note: These "knocked down" assembly instructions apply only to horizontal tank stands from Monroe, Louisiana.

Assemble Side Angle Braces

Place Tank on Stand

Position SS Tabs

Finished Assembly

ANNUAL TANK INSPECTION CHECKLIST

Even relatively new polyethylene tanks should receive routine and careful visual inspections. These inspection guidelines should be followed at least annually to ensure the safety of personnel and the preservation of the chemical stored. **The tank should be replaced if it displays stress cracking, crazing, or embrittlement.**

- ☐ Empty the tank. Neutralize any chemical remaining. Thoroughly clean the exterior and interior of the tank. A dirty tank cannot be properly inspected.
- ☐ Examine the exterior and the interior of the tank for cracking, crazing and brittle appearance.
- ☐ Pay particular attention to areas around fittings and where different portions of the tank converge into one another. In other words, give special attention to "corners" where sidewall and dome meet and where sidewall and bottom meet.
- ☐ If a confined space entry is not feasible, use a bright light source to inspect the tank interior from the manway opening. An interior inspection is essential because stress cracks normally show up on the inside of a tank before appearing on the outside.
- ☐ Don't forget to inspect areas of the tank that never actually come in contact with the chemical stored. With fume-emitting chemicals, oxidation and resulting embrittlement of the dome can occur without any actual contact with the chemical stored.
- ☐ Inspect fittings, flexible connection hoses, and gaskets for leaks and signs of general corrosion or deterioration.
- ☐ Inspect vents and fume scrubbers to ensure adequate venting for pressure and vacuum. Ensure end of scrubber piping is never submerged in more than 6-inches of liquid.
- ☐ Confirm that filling of the tank from tanker trucks is not causing over pressurization and not ending with a line purge that "balloons" the tank. See "VENTING" on page 5 or 11.
- ☐ Confirm secondary containment is appropriate for chemical stored, adequate in size, and in good repair.

WARNING: Failure to follow these inspection guidelines and take necessary corrective actions can result in unintended chemical release causing serious property damage, injury, or death.

Chemical fumes may be present in the area of the manway opening.

A tank is a confined space. Do not enter tank without a confined space entry and retrieval plan.

Use lift equipment and/or fall protection to prevent fall into or away from tank.

DO NOT STAND OR WORK ON TOP OF TANK. Dome surfaces are flexible and slippery. The dome may be embrittled. A dangerous fall could occur.

CUSTOMER INSTALLATION GUIDELINES FOR FRP LADDERS

Pre-Installation

Tank will arrive with bracket attached

Ladders will arrive packaged

Unpacking the ladder components

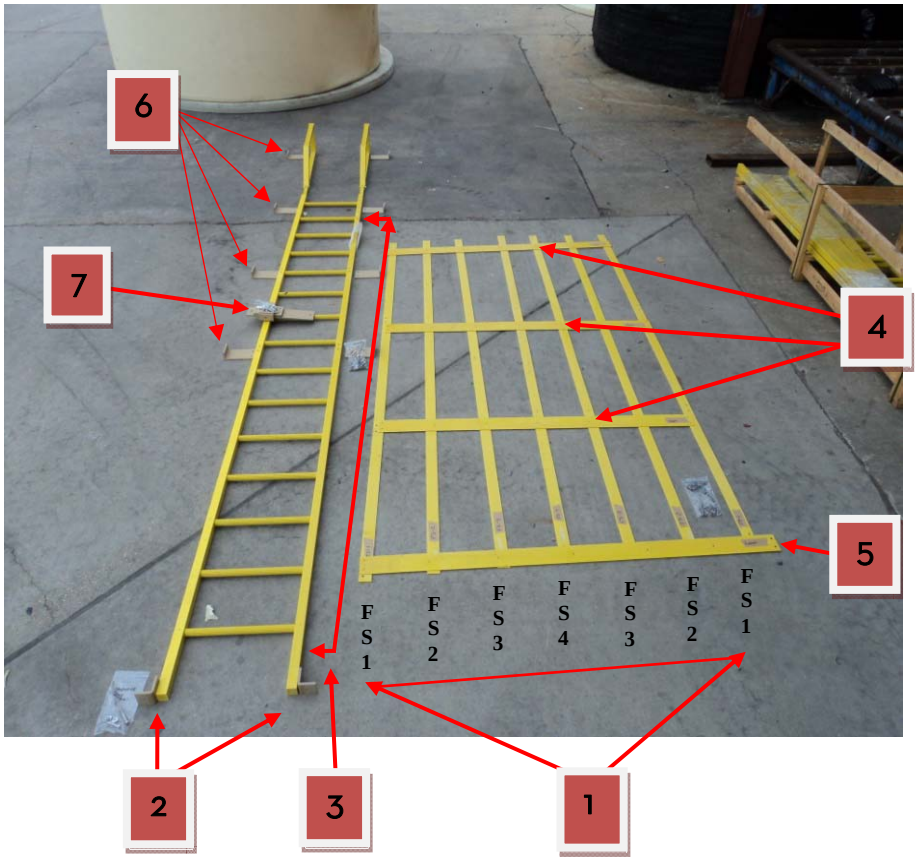
To uncrate ladder, remove end panel & slide ladder out

Step 1
Layout the Ladder Components

FRP ladders are provided in a variety heights and assemblies. The example shown is a 15 foot ladder with cage, return, and adjustable support bracket. EACH FRP "part" provided is labeled for easy installation. Hardware needed for each part is packaged individually for the specific use.

Laying out the components of your ladder will ensure you have all the parts needed and make installation simple.

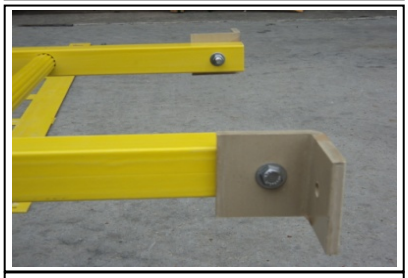
1	Vertical cage slats are numbered as shown in the photo and must be installed in this sequence. Both of the FS-1 slats will have additional bolt holes for attachment to the cage brackets
2	Feet and hardware
3	Main ladder span
4	Upper Cage Hoops
5	Lower Cage Hoop (the longest of the hoops)
6	Cage Attachment bracket for both sides of the ladder span
7	Adjustable support bracket

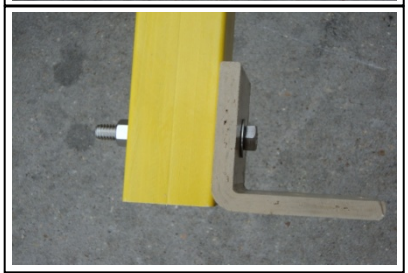


Ladder assembly and installation WARNINGS:

1. Make certain there is an adequate, level landing where the ladder will be installed.
2. Ladder is heavy. Use mechanical lifting equipment to raise ladder to vertical position.
3. Do not climb ladder in any manner until it is fully attached both top and bottom. Use portable ladders, scaffolding, or personnel lifts when installing ladder.
4. Do not stand or work on top of tank. The tank surfaces are flexible and slippery and a dangerous fall could occur. There is no weight or load rating for the domes of tanks.

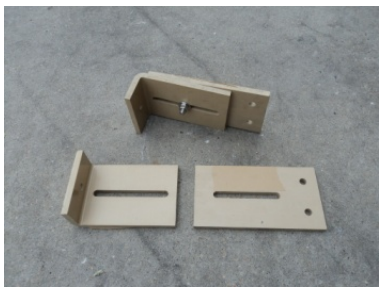
Step 2
Attach Feet to the Bottom of the





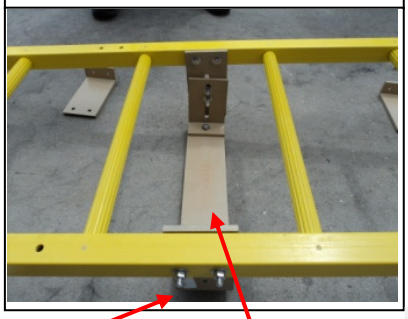
Step 3
Assemble and attach adjustabe support bracket

Bolt the mounting bracket To the adjustment plate



Completed assembly

Support bracket bolted to ladder rails



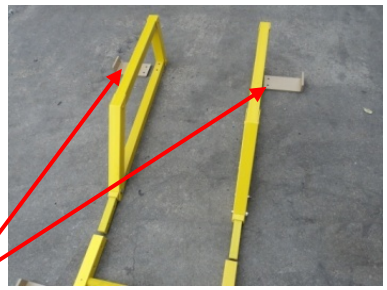
1

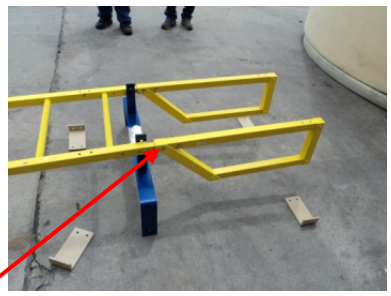
2

1 Use pre-drilled holes approximately at the midpoint of ladder. Install bolts with bolt head on the inside of ladder railing and nuts and washers on the outside.

2 Flat side of support bracket is to be directed toward the tank

Step 4
Install returns or walk through if applicable at





1

2

1 Returns/walk through sections are designed to slide inside the ladder railing

2 There are 2 pre drilled bolt holes for the returns. INSTALL ONLY THE TOP bolt, washer and nut as the bottom bolt holes will be used to attach to the ladder bracket, (blue), which comes already attached to the tank. Ladder bracket shown in photo has been removed from tank for clarity. DO NOT remove bracket from tank when making field installation.

Step 5
Install cage attachment brackets

Detail showing cage attachment bracket bolted to ladder railing

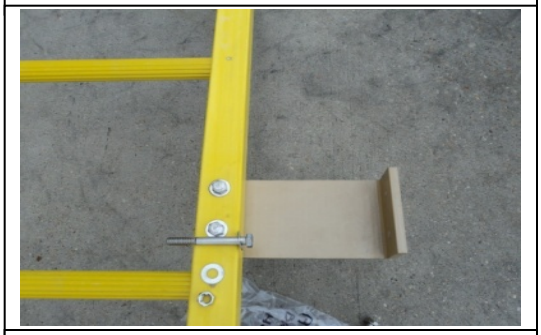


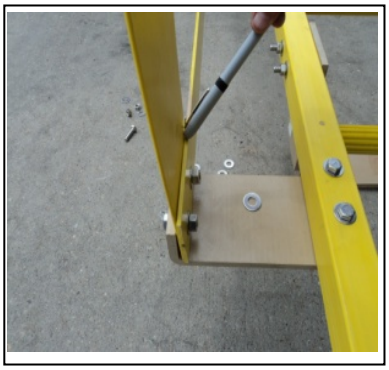
Photo showing location for cage attachment brackets to ladder railing (8 total). Heads of bolts are on climbers side of ladder.

Labeling and sequence of installation is critical

Begin by laying both of the FS-1 vertical slats EDGE ways on the cage attachment brackets

Install the hoops by bolting one side and then bending the hoop to the other side , install bolts

Note: That Vertical slat goes inside the hoop



Step 6
Install the cage to the ladder

Review the layout to ensure it is correct

Finished assembly of cage

STOP Carefully check tightness, 5 ft. lbs., of all nuts and bolts before proceeding.

Ladder assembly and installation WARNINGS:

1. Make certain there is an adequate, level landing where the ladder will be installed.
2. Ladder is heavy. Use mechanical lifting equipment to raise ladder to vertical position.
3. Do not climb ladder in any manner until it is fully attached at both top and bottom. Use portable ladders, scaffolding, or personnel lifts when installing ladder.
4. Do not stand or work on top of tank. The tank surfaces are flexible and slippery and a dangerous fall could occur. There is no weight or load rating for the domes of tanks.

In addition:

5. Make certain the four bolts associated with the metal ladder attachment bracket are tight before using ladder.
6. No field drilling of holes in the ladder is required. Do not drill extra holes or enlarge factory drilled holes.
7. When fully assembled, the ladder and accessories should have no unfilled bolt holes.
8. Perform an annual routine inspection of the ladder tightening bolts and looking for signs of damage or deterioration. Remove any suspect ladder from service and destroy.

Step 7
Attach the ladder to the tank using the metal ladder bracket

CAUTION
Lift the ladder by mechanical means such as a fork lift and align the pre drilled holes in the top of the ladder railing with the holes in the tank's metal ladder bracket. The tabs of the ladder bracket go inside the ladder rails.

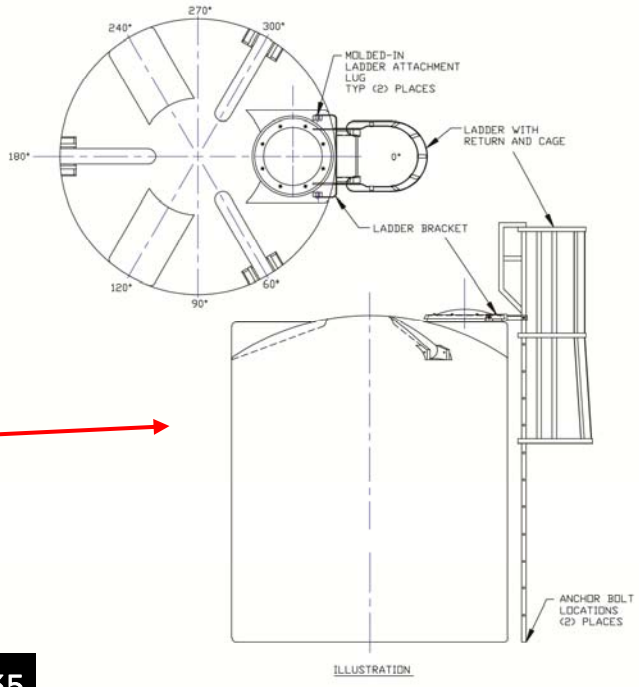
Bolt the ladder and bracket to one another using the 3/8" x 2 ·" bolts. Torque to 5 ft. lbs.

Step 8
Make Adjustments

Plumb the ladder. Mark the location for the anchor bolts. Drill anchor holes and attach ladder to foundation.

After the ladder has been aligned and securely attached at top and bottom, adjust to support bracket so that the flat side touches the outer wall of the tank, tighten support bracket bolts.

Drawing Example



LIMITED WARRANTY

POLY PROCESSING COMPANY PRODUCT	WARRANTY PERIOD
CROSSLINKED POLYETHYLENE TANKS for all suitable applications except those listed below	5 yrs.
IMFO® tanks storing SODIUM HYPOCHLORITE 9-15 wt% XLPE w/ OR-1000™, 1.9 spg rating	5 yrs.
NON-IMFO® tanks storing SODIUM HYPOCHLORITE 9-15 wt% 1,000 gallons and larger: XLPE w/ OR-1000™, 1.9 spg rating Less than 1,000 gallons: XLPE 1.9 spg rating	3 yrs.
Tanks storing SULFURIC ACID ≥ 80% concentration SAFE-Tank® to 8,700 gallons: XLPE w/ OR-1000™, 2.2 spg rating Vertical tanks 1,000-6,600 gallons: XLPE w/ OR-1000™, 2.2 spg rating Vertical tanks less than 1,000 gallons: XLPE 1.9 spg rating	3 yrs.
Tanks storing HYDROCHLORIC ACID ≤ 37% concentration XLPE w/ OR-1000™, 1.9 spg rating	5 yrs.
Tanks storing HYDROCHLORIC ACID ≤ 37% concentration XLPE 1.9 spg rating	3 yrs.
LINEAR POLYETHYLENE TANKS for all suitable applications except Sodium Hypochlorite 9-15 wt%; Sulfuric Acid and Hydrochloric Acid of any concentration	3 yrs.

Poly Processing Company's warranty consists of repair or replacement of defective product. Owner and/or user may be requested to provide a cleaned section of the product in question for evaluation. Product disposal or alternate use is the owner's and/or user's responsibility. Warranty begins at date of shipment from PPC plant. Parts and ancillary items are warranted for ninety (90) days.

Poly Processing Company's liability is limited to either repair or replacement of its product. By accepting delivery of the product, owner and/or user waives any claim against PPC for incidental or consequential damages as they relate to lost profits or sales or to injury of persons or property, including secondary containment. Owner and/or user accepts full responsibility for providing secondary containment appropriate and adequate for the stored material.

This warranty will be nullified if:

1. Product has been used in manner other than its originally declared purpose or if PPC tank recommendations have not been followed.
2. Product has not been installed, used and maintained in accordance with a) all federal, state and local laws and regulations; b) generally accepted best practices within the applicable industry; and c) guidelines set forth in the PPC Installation Manual and/or in PPC Technical Overviews.
3. Product has been altered or repaired by unauthorized personnel.
4. Notification of the defect has not been made in writing within the warranty period.
5. Invoice for product has not been paid.
6. Product has been subjected to misuse, negligence, fire, accident, act of war or act of God.

The limited warranty described herein is Poly Processing Company's sole warranty and the complete, final and exclusive statement of the terms of the warranty. Owner and/or user may not rely on any oral statement or representations. This warranty is neither assignable nor transferable.

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