



Department of Environmental Protection

2600 Blair Stone Road ♦ Tallahassee, Florida 32399-2400

DEP Form: 62-762.901(9)

Form Title: Storage Tank Equipment

Registration Form

Effective Date: July 2019

Incorporated in Rule 62-762.851, F.A.C.

Storage Tank System Equipment Registration Form

Fill out completely

General Information

Company Name: Poly Processing Contact Name: Dan Comp
Company Address: 2201 Old Strelington Road City, State: 508 Filsinger Ln, Oakland, MD Zip: 21550
E-mail: vindexboy@icloud.com Contact Number: 410-790-6854
Product Name: XLPE storage tanks (full line) for storing mineral acids
Model Number(s): Multiple Product Type: XLPE; OR-1000 lined XLPE
Rule(s) citation that registration is being requested within Chapter 62-761 (UST), and/or 62-762 (AST), F.A.C.: 62-762.901

Write a brief description of equipment registration request including product limitations:

Poly processing manufactures roto-molded XLPE tanks for storing regulated substances, in this case mineral acids, bases and boicides. Accompanying this form is suplimental documentation for multiple sizes and design styles.

Information Checklist (Choose Yes, No, or N/A - Not Applicable):

	Yes	No	N/A
1. Third-party Certification by a Nationally Recognized Testing Laboratory? (Required)	☒	☐	☐
2. Documentation of third-party evaluation that the equipment meets DEP Rules?	☒	☐	☐
3. Documents included about the qualifications of the Nationally Recognized Testing Laboratory?	☒	☐	☐
4. Technical information and drawings included?	☒	☐	☐
5. Installation instructions included?	☒	☐	☐
6. Annual Operability Testing Requirements (Rules 62-761.500, 62-762.501, & 62-762.502 F.A.C.)?	☒	☐	☐
7. Integrity Testing Requirements (Rules 62-761.700, 62-762.701, & 62-762.702, F.A.C.)?	☒	☐	☐
8. Compatible with fuel blends containing >10% ethanol or >20% biodiesel?	☐	☐	☒
9. Has the product been approved or registered in other countries or states? (If so provide list)	☒	☐	☐
10. Any requirements for company-certified installers or trainers?	☒	☐	☐
11. Was this product(s) previously approved or registered by the Department? If yes, EQ- _____	☐	☒	☐
12. Any changes or modifications to the equipment since the last submittal to DEP?	☐	☒	☐

Document Information: Provide supporting documents indicated as "Yes" above including this form via email to Tanknotify@floridadep.gov, or documents can be sent to FDEP, Division of Waste Management, 2600 Blair Stone Road, MS 4560, Tallahassee, FL 32399.

Write a brief description of equipment installation and performance in the U.S.:

See accompanying installation documentation.

Equipment Registration Certification:

To the best of my knowledge and belief, all information submitted on this form is true, accurate and complete.

Dan Comp. Consultant
Printed Name and Title

Signature (right click to sign)

01/27/2025
Date

For Department Use Only:

Date Application Received: 1/27/2025

Application complete:

Yes: ☒ No: ☐

EQ- 1017 Date of complete or incomplete letter sent: 1/27/2025 Date Equipment Requires Renewal: 1/27/2030

Storage tank system equipment requires renewal every 5 years in accordance with subsection 62-762.851(2), F.A.C.

VERTICAL
HIGH DENSITY CROSS-LINKED POLYETHYLENE STORAGE TANKS
NSF/ANSI 61 (Remove if not required)

PART 1-GENERAL

1.01 Requirements

1. The CONTRACTOR shall provide a vertical, high density cross-linked polyethylene tanks and accessories per section 2.05, complete and in place, in accordance with the Contract Documents.
2. Unit Responsibility: The CONTRACTOR shall be responsible for furnishing the vertical tank(s) and its accessories for the chemical storage as noted.

1.02 REFERENCES, CODES AND STANDARDS

- A. American Society of Testing Materials (ASTM).
- | | |
|----------|---|
| 1. D638 | Tensile Properties of Plastics |
| 2. D883 | Standard Definitions of Terms Relating to Plastics |
| 4. D1505 | Density of Plastics by the Density-Gradient Technique |
| 5. D1693 | ESCR Specification Thickness 0.125" F50-10% Igepal |
| 6. F412 | Standard Terminology Relating to Plastic Piping Systems |
- B. ANSI Standards: B-16.5, Pipe Flanges and Flanged Fittings
- C. Building Code: International Building Code, IBC 2018 / 2021
- D. ARM: Low Temperature Impact Resistance (Falling Dart Test Procedure).
- E. NSF/ANSI Standard 61, AWWA – Drinking Water System Components
- F. ASTM D-1998, Standard Specification for Polyethylene Upright Storage Tanks

1.03 SUBMITTALS

- A. Shop Drawings: Shop drawings shall be approved by the engineer or contractor prior to the manufacturing of the vertical tank(s). Submit the following as a single complete initial submittal. Sufficient data shall be included to show that the product conforms to Specification requirements. Provide the following additional information:
1. Vertical tank and Fitting Material
 - a. Resin Manufacturer Data Sheet
 - b. Fitting Material
 - c. Gasket style and material
 - d. Bolt material

2. Dimensioned Tank Drawings

- a. Location and orientation of openings, fittings, accessories, restraints and supports.
- b. Details of manways, flexible connections, and vents.

3. Calculations shall be stamped and signed by a registered, third party engineer in the State of installation.

- a. Tank restraint system. Show seismic and wind criteria.

B. Manufacturer's warranty

C. Manufacturer's unloading procedure (see Poly Processing Company Installation Manual)

A. Manufacturer's installation instructions (see Poly Processing Company Installation Manual)

B. Supporting information of Quality Management System.

F. Electrical heat tracing and foam insulation data sheets as required.

G. Supporting documentation of Manufacturer's certification to NSF/ANSI Standard 61 – Drinking Water System Components for water treatment chemicals. (Remove if not required)

H. Manufacturer's Qualifications: Submit to engineer a list of 5 installations in the same service as proof of manufacturer's qualifications.

I. Factory Test Report

- 1. Wall thickness verification.
- 2. Fitting placement verification.
- 3. Visual inspection
- 4. Impact test
- 5. Gel test
- 6. Hydrostatic test

1.04 QUALITY ASSURANCE

- A. The CONTRACTOR shall provide a vertical tank of high density cross-linked polyethylene. Tanks furnished under this Section shall be supplied by Poly Processing Company or approved equal who has been regularly engaged in the design and manufacture of chemical storage tanks for over 10 years.
- B. Tanks shall be manufactured from virgin materials.
- C. Tanks shall be manufactured from materials certified to NSF/ANSI Standard 61 for chemical storage and submit form from NSF supporting chemical certification. (Remove if not required)

1.05 WARRANTY

- A. The warranty shall be provided upon request for the specific service application. For most chemical applications, Poly Processing Company offers a limited 5 year full replacement warranty. For Sulfuric Acid, Hydrochloric Acid, and Sodium Hypochlorite the warranty varies. See Poly Processing Company's chemical specific positions and warranty statement.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Tanks shall be rotationally-molded, vertical, high density cross-linked polyethylene, one-piece seamless construction, cylindrical in cross-section and vertical with flat bottoms. Tanks shall be adequately vented as prescribed in Poly Processing Company's Technical Bulletin, Venting-Design for ACFM (air cubic feet per minute). Where indicated, tanks shall be provided with ancillary mechanical fittings and accessories. Tanks shall be marked to identify the manufacturer, date of manufacture and serial numbers must be permanently embossed into the tank.

2.02 MANUFACTURER

- A. Tanks shall be manufactured by Poly Processing Company.

2.03 POLYETHYLENE STORAGE TANKS

- A. Service: Chemical storage tanks shall be suited for the following operating conditions:
- B. High Density Cross-linked Polyethylene resin used in the tank manufacture shall be Poly CL™ or equal and shall contain ultraviolet stabilizer as recommended by resin manufacturer. Where black tanks are indicated, the resin shall have a carbon black compounded into it. The tank material shall be rotationally molded and be a resin that is commercially available at the time of tank manufacture.
- C. For sodium hypochlorite, sulfuric acid storage, and other oxidizing chemicals, tank resin shall include an antioxidant polyethylene system (OR-1000) with four times the antioxidant properties of a standard polyethylene bonded to the interior surface during the manufacturing process.
- D. **Wall thickness** for a given hoop stress is to be calculated in accordance with ASTM D 1998. In NO case shall the tank thickness be less than design requirements per ASTM D 1998.

- 1. The wall thickness of any cylindrical portion at any fluid level shall be determined by the following equation:

$$T = P \times OD/2SD \text{ or } 0.433 \times SG \times H \times OD/2SD$$

Where:	T	=	wall thickness, in
	P	=	pressure, psi
	SG	=	specific gravity, gm/cc
	H	=	fluid head, ft
	OD	=	outside diameter, ft
	SD	=	hydrostatic design stress

- a. The minimum wall thickness shall be sufficient to support its own weight in an upright position without external support but shall not be less than 0.187" thick.

2. On closed top tanks the top head shall be integrally molded with the cylindrical wall. Its minimum thickness shall be equal to the thickness of the top of the straight sidewall. In most cases, flat areas shall be provided for attachment of large fittings on the dome of the tank.
3. The bottom head shall be integrally molded with the cylindrical wall. Knuckle radius shall be:

Tank Diameter, ft	Min Knuckle Radius, in
less than or equal to 6	1
greater than 6	1-1/2

4. Tanks with 3000 gal capacity or larger shall have at least 3 lifting lugs. Lugs shall be designed for lifting the tank when empty.
 - a. Unless otherwise indicated by Contract drawings, for indoor pneumatic fill, manways shall be 24-in diameter or greater and equipped with an emergency pressure relief device or SAFE-Surge™ Manway with pressure relief at 6" water column to prevent over-pressurization. The SAFE-Surge manway shall be chemically compatible with the chemical being stored. Gaskets shall be closed cell, cross-linked polyethylene foam, Viton, or EPDM materials.
 - b. Unless otherwise indicated by Contract drawings, for outdoor pneumatic fill, manways shall be 24-in diameter or greater and equipped with Poly Processing Company's F.S.2650® combined manway and vent to prevent over pressurization of tank. Manway must be capable of relieving a volume flow rate of up to 2650 ACFM. Gaskets shall be closed cell, cross-linked polyethylene foam, Viton, or EPDM materials.
 - c. Unless otherwise indicated, tanks less than 2000 gallons in non-pneumatic applications shall have a manway cover 17-in or smaller of Polyethylene material with a coarse thread. Gaskets shall be closed cell, cross-linked polyethylene foam, viton or EPDM materials.

NOTE: Tanks must be vented to allow for performance at atmospheric pressure, in accordance with the following matrix:

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	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

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

rev. Nov 2006

- E. Tank colors shall be natural (unpigmented), black (compounded), or as specified by the ENGINEER with written agreement by the tank manufacturer.

2.04 TANK ACCESSORIES

A. Ladder: (Remove if not required)

1. [Painted carbon steel], [fiberglass], [galvanized carbon steel] or [stainless steel] access ladders shall be provided with the polyethylene chemical storage tanks at locations as shown. Safety cages shall be added to ladders as required, per OSHA.
2. Ladders must be secured to the tank and secured to the concrete to allow for tank expansion/contraction due to temperature and loading changes. Use proper chemical resistant materials when anchoring to tank dome or sidewall. See Poly Processing Company's Tank Installation Manual.
3. All ladders shall be designed to meet applicable OSHA standards. Reference: OSHA 2206; 1910.27; fixed ladders.

B. Restraint System: (Remove if not required)

1. Metal components to be [galvanized], [stainless steel], or [painted clips], edge softeners, and tension ring with [stainless steel], [galvanized] cables and clamps.
2. Tank restraint system shall be supplied and the design of same certified by a Structural Engineer registered in the State of tank installation. Design shall conform to the most recent edition of the IBC code for seismic and wind load. Anchor bolts as required by the calculations shall be supplied by the tank manufacturer

C. Heat Tracing: (Remove if not required)

1. Heat tracing system for temperature maintenance shall be SilcoPad® tank heating systems designed to maintain a desired product temperature, not to exceed 100 degrees F. Each system shall include tank heating pads and a temperature controller. The quantity and type of SilcoPad® is determined by the size of the tank, the desired temperature maintenance and environmental conditions. Systems shall be available in 30, 60 or 100 degrees F. Tanks are supplied with the heating panels and a controller installed by Poly Processing Company. Power supply to be the only field installation required.
 - a. Pads to operate on 120 vac single phase with a maximum power density of 0.5 watts/sq.inch.
 - b. Silicone pad heaters must fully comply with Article 427-23 (b) of the National Electric Code.
 - c. Temperature controller to be supplied with two electronic thermostats switching the heating system via one solid state relay. Primary thermostat to control desired product temperature and secondary thermostat to provide over temperature protection at 150 degrees F.

D. Insulation: (Remove if not required)

1. Insulation used shall be polyurethane foam with a density of 2.5 lb/ft³ with a minimum an "R" value of 6.3/in. The foam shall be applied with a nominal thickness of 2" to the external tank surfaces except the tank bottom.
2. Upon completion of application and curing of the insulation, 2 full coverage coats of latex mastic coating shall be applied to the surface of the insulation in such manner as to seal the insulation from the outside environment.

2.05 TANKS:

A. Tank Schedule per the following specifications

Note 1: Approximate overall height is measured along the straight cylindrical portion of the tank and includes the dome top.

B. Fittings

1. Tank fittings shall be according to the fitting schedule in 2.05B above. Threaded fittings shall use American Standard Pipe Threads. If tanks are insulated, fittings shall be installed at the factory prior to application of the insulation.
2. Bolted flange fittings shall be constructed of one 150 lb. flange with ANSI bolt pattern, one flange gasket and stud bolts with gaskets. Stud bolts to have chemical resistant polyethylene injection molded heads and gaskets to provide a sealing surface between the bolt head and the interior tank wall. Stud bolt heads are to be color coded for visual ease of identifying the bolt material by onsite operators. Green- 316 Stainless Steel, Black- Titanium, Red- Alloy C-276, Blue- Monel. All materials shall be compatible with chemical service and as indicated in the fitting schedule above. For NSF/ANSI 61 certification, EPDM or Viton GF gaskets shall be supplied.
3. For sodium hypochlorite and sulfuric acid storage, Bolted One-Piece Sure Seal (B.O.S.S.), double flange fittings constructed of virgin polyethylene shall be supplied. Bolts will be welded to a common backing ring and encapsulated with polyethylene preventing fluid contact with the metal material. Flange will have one full face gasket to provide a sealing surface against inside tank wall. All materials shall be compatible with chemical service and as indicated in the fitting schedule above. For NSF/ANSI 61 certification, EPDM or Viton GF gaskets shall be supplied.
4. Down Pipes and Fill Pipes: Down pipes and fill pipes shall be supported at 6-ft max intervals. Down pipes and fill pipes shall be PVC or material compatible with the chemical stored.
5. U-Vents: Each tank must be vented for the material and flow and withdrawal rates expected. Vents should comply with OSHA 1910.106(F)(iii)(2)(IV)(9). U-vents shall sized by the tank manufacturer and be furnished complete with insect screen if required (Insect screen lessens the vent capacity by 1/3) in accordance with the venting schedule listed above.

6. All fittings on the 1/3 lower sidewall of tanks with capacities ≥ 1000 gallons shall have

100% virgin PTFE Flexijoint® expansion joint. Expansion joint to have a minimum of 3 convolutions, stainless steel limit cables and FRP composite flanges. Galvanized parts will not be accepted.

Expansion joint to meet the following minimum performance requirements:

Axial Compression $\geq 0.67''$
Axial Extension $\geq 0.67''$
Lateral Deflection $\geq 0.51''$
Angular Deflection $\geq 14^\circ$
Torsional Rotation $\geq 4^\circ$

2.06 LEVEL INDICATION (Remove if not required)

- A. Float Indication: The level indicator shall be assembled to the tank and shall consist of PVC float, indicator, polypropylene rope, perforated interior pipe, PVC roller guides, clear UV resistant PVC sight tube EnviroKing® by C.F. Harvel, and necessary pipe supports. The level indicator shall act inversely to the tank contents and shall not allow entrance of tank contents into the sight tube at any time. Indicator shall be neon orange color for visual ease for onsite operators.
- B. Ultrasonic Level Indicator: The ultrasonic level indicator shall be a Flowline ultrasonic level transmitter, level controller with one 4-20 mA or 0-10 VDC continuous level input and NEMA 4X box to be supplied by tank manufacturer.

2.07 FACTORY TESTING

A. Material Testing

- 1. Perform gel and low temperature impact tests in accordance with ASTM D 1998 on condition samples cut from each polyethylene chemical storage tank.
- 2. Degree of Crosslinking. Use Method C of ASTM D 1998- Section 11.4 to determine the ortho-xylene insoluble fraction of cross-linked polyethylene gel test. Samples shall test at no less than 60 percent.

B. Tank Testing

- 1. Dimensions: Take exterior dimensions with the tank empty, in the vertical position. Outside diameter tolerance, including out-of-roundness, shall be per ASTM D 1998. Fitting placement tolerance shall be +/- 1/2-in vertical and +/- 1 degree radial.
- 2. Visual: Inspect for foreign inclusions, air bubbles, pimples, crazing, cracking, and delamination.
- 3. Hydrostatic test: Following fabrication, the bottom tanks, including inlet and outlet fittings, shall be hydraulically tested with water by filling to the top sidewall for a minimum of 1 hour and inspected for leaks. Following successful testing, the tank shall be emptied and cleaned prior to shipment.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. The tank shall be shipped upright or lying down on their sides with blocks and slings to keep them from moving. AVOID sharp objects on trailers.
- B. All fittings shall be installed and, if necessary, removed for shipping and shipped separately unless otherwise noted by the contractor.
- C. Upon arrival at the destination, inspect the tank(s) and accessories for damage in transit. If damage has occurred, Poly Processing Company shall be notified immediately.

3.02 INSTALLATION

- A. Install the tanks in strict accordance with Poly Processing Company's Tank Installation Manual and shop drawings.
- B. Installation will be inspected by manufacturer to verify system flexible connections, venting and fittings are properly installed. In addition to on-sight inspection tank system(s) to be reviewed using tank manual check list as supplied by manufacture as listed below.
- C. Manufacturer to provide 1 hour training session to prepare operators to service and maintain the tank system. Included in training session will be (#) training manuals.
- D. Manufacturer's trained technician to do an onsite inspection of installation. Inspection will verify chemical application, plumbing connections, venting, and applicable ancillary equipment such as ladders, restraints, etc. A verification of proper installation certificate will be supplied when equipment passes installation checklist.
- E. Tank manuals will consist of installation check lists, tank drawing(s) as built, fitting drawings referencing nozzle schedule on tank drawing, materials of construction, and recommended maintenance program.

3.03 FIELD TESTING

- A. Poly Processing Company recommends that all tanks be hydro-tested for 24 hours prior to commissioning.

End of Section

Rev. 3-30-17

INTEGRALLY MOLDED FLANGED OUTLET (IMFO®) - COMPLETE DRAIN
HIGH DENSITY CROSS-LINKED POLYETHYLENE STORAGE TANKS
NSF/ANSI 61 (Remove if not required)

PART 1-GENERAL

1.01 Requirements

1. The CONTRACTOR shall provide an integrally molded flanged outlet (IMFO®), high density cross-linked polyethylene tank and accessories per section 2.05, complete and in place, in accordance with the Contract Documents.
2. Unit Responsibility: The CONTRACTOR shall be responsible for furnishing the integrally molded flanged outlet IMFO® tank(s) and its accessories for chemical storage as indicated.

1.02 REFERENCES, CODES AND STANDARDS

- A. American Society of Testing Materials (ASTM).
- | | |
|----------|---|
| 1. D638 | Tensile Properties of Plastics |
| 2. D883 | Standard Definitions of Terms Relating to Plastics |
| 4. D1505 | Density of Plastics by the Density-Gradient Technique |
| 5. D1693 | ESCR Specification Thickness 0.125" F50-10% Igepal |
| 6. F412 | Standard Terminology Relating to Plastic Piping Systems |
- B. ANSI Standards: B-16.5, Pipe Flanges and Flanged Fittings
- C. Building Code: International Building Code - IBC 2018 / 2021
- D. ARM: Low Temperature Impact Resistance (Falling Dart Test Procedure).
- E. NSF/ANSI Standard 61, AWWA – Drinking Water System Components
- F. ASTM D-1998, Standard Specification for Polyethylene Upright Storage Tanks

1.03 SUBMITTALS

- A. Shop Drawings: Shop drawings shall be approved by the engineer or contractor prior to the manufacturing of the integrally molded flanged outlet, IMFO® tank(s). Submit the following as a single complete initial submittal.
Sufficient data shall be included to show that the product conforms to Specification requirements.
Provide the following additional information:
1. Integrally molded flanged outlet IMFO® tank and Fitting Material
 - a. Resin Manufacturer Data Sheet
 - b. Fitting Material
 - c. Gasket style and material
 - d. Bolt material

2. Dimensioned Tank Drawings

- a. Location and orientation of molded in fitting (IMFO®), openings, fittings, accessories, restraints and supports.
 - b. Details of inlet and molded outlet fitting (IMFO®), manways, flexible connections, and vents.
3. Calculations shall be stamped and signed by a registered, third party engineer in the State of the installation.
- a. Tank restraint system. Show seismic and wind criteria.

B. Manufacturer's warranty

C. Manufacturer's unloading procedure (see Poly Processing Company Installation Manual)

A. Manufacturer's installation instructions (see Poly Processing Company Installation Manual)

B. Supporting information of Quality Management System

C. Supporting documentation of Manufacturer's certification to NSF/ANSI Standard 61 – Drinking Water System Components for water treatment chemicals. (Remove if not required)

A. Manufacturer's Qualifications: Submit to engineer a list of 5 installations in the same service as proof of manufacturer's qualifications.

B. Electrical heat tracing and foam insulation data sheets, as required.

I. Factory Test Report

1. Wall thickness verification.
2. Fitting placement verification including molded in outlet (IMFO®)
3. Visual inspection
4. Impact test
5. Gel test
6. Hydrostatic test

1.04 QUALITY ASSURANCE

- A. The CONTRACTOR shall provide a vertical, high density cross-linked polyethylene tank with full drain capability and molded in flange. The integrally molded flanged outlet IMFO® tanks of the same material furnished under this Section shall be supplied by Poly Processing Company or approved equal who has been regularly engaged in the design and manufacture of chemical storage tanks for over 10 years.
- B. Tanks shall be manufactured from virgin materials.
- C. Tanks shall be manufactured from materials certified to NSF/ANSI Standard 61 for chemical storage and submit form from NSF supporting chemical certification. (Remove if not required)

1.05 WARRANTY

- A. The warranty shall be provided upon request for the specific service application. For most chemical applications, Poly Processing Company offers a limited 5 year full replacement warranty. For Sulfuric Acid, Hydrochloric Acid, and Sodium Hypochlorite the warranty varies. See Poly Processing Company's chemical specific positions and warranty statement.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Tanks shall be rotationally-molded, integrally molded flanged outlet IMFO®, high density cross-linked polyethylene, one-piece seamless construction, cylindrical in cross-section and vertical with flat / sloping bottoms in axis. Tanks shall be adequately vented as prescribed in Poly Processing Company's Technical Bulletin, Venting-Design for ACFM (air cubic feet per minute). Where indicated, tanks shall be provided with ancillary mechanical fittings and accessories. Tanks shall be marked to identify the manufacturer, date of manufacture and serial numbers must be permanently embossed into the tank.

2.02 MANUFACTURER

- A. Tanks shall be manufactured by Poly Processing Company or Engineer approved equal.

2.03 POLYETHYLENE STORAGE TANKS

- A. Service: Chemical storage tanks shall be suited for the following operating conditions per this section.
- B. High Density Cross-linked Polyethylene resin used in the tank manufacture shall be Poly CL™ or equal and shall contain ultraviolet stabilizer as recommended by resin manufacturer. Where black tanks are indicated, the resin shall have a carbon black compounded into it. The tank material shall be rotationally molded and be a resin that is commercially available at the time of tank manufacture.
- C. For sodium hypochlorite, sulfuric acid storage, and other oxidizing chemicals, tank resin shall include an antioxidant polyethylene system (OR-1000) with four times the antioxidant properties of a standard polyethylene bonded to the interior surface during the manufacturing process.
- D. **Wall thickness** for a given hoop stress is to be calculated in accordance with ASTM D 1998. In NO case shall the tank thickness be less than design requirements per ASTM D 1998.

1. The wall thickness of any cylindrical portion at any fluid level shall be determined by the following equation:

$$T = P \times OD/2SD \text{ or } 0.433 \times SG \times H \times OD/2SD$$

Where:	T	=	wall thickness, in
	P	=	pressure, psi
	SG	=	specific gravity, gm/cc
	H	=	fluid head, ft
	OD	=	outside diameter, ft
	SD	=	hydrostatic design stress

- a. The minimum wall thickness shall be sufficient to support its own weight in an upright position without external support but shall not be less than 0.187" thick.
2. On closed top tanks the top head shall be integrally molded with the cylindrical wall. Its minimum thickness shall be equal to the thickness of the top of the straight sidewall. In most cases, flat areas shall be provided for attachment of large fittings on the dome of the tank.
3. The bottom head shall be integrally molded with the cylindrical wall. Knuckle radius shall be:

Tank Diameter, ft	Min Knuckle Radius, in
less than or equal to 6	1
greater than 6	1-1/2

4. Tanks with 3000 gal capacity or larger shall have at least 3 lifting lugs. Lugs shall be designed for lifting the tank when empty.
 - a. Unless otherwise indicated by Contract drawings, for indoor pneumatic fill, manways shall be 24-in diameter or greater and equipped with an emergency pressure relief device or SAFE-Surge™ Manway with pressure relief at 6" water column to prevent over-pressurization. The SAFE-Surge manway shall be chemically compatible with the chemical being stored. Gaskets shall be closed cell, cross-linked polyethylene foam, Viton, or EPDM materials.
 - b. Unless otherwise indicated by Contract drawings, for outdoor pneumatic fill, manways shall be 24-in diameter or greater and equipped with Poly Processing Company's F.S.2650® combined manway and vent to prevent over pressurization of tank. Manway must be capable of relieving a volume flow rate of up to 2650 ACFM. Gaskets shall be closed cell, cross-linked polyethylene foam, Viton, or EPDM materials.
 - c. Unless otherwise indicated, tanks less than 2000 gallons in non-pneumatic applications shall have a manway cover 17-in or smaller of Polyethylene material with a coarse thread. Gaskets shall be closed cell, cross-linked polyethylene foam, viton or EPDM materials.

NOTE: Tanks must be vented to allow for performance at atmospheric pressure, in accordance with the following matrix:

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	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

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

rev. Nov 2006

- E. Tank colors shall be natural (un-pigmented), or black (COMPOUNDED), or as specified by the ENGINEER with written agreement by the tank manufacturer.

2.04 TANK ACCESSORIES

- A. Ladder: (Remove if not required)

1. [Painted carbon steel], [fiberglass], [galvanized carbon steel] or [stainless steel] access ladders shall be provided with the polyethylene chemical storage tanks at locations as shown. Safety cages shall be added to ladders as required, per OSHA.
 2. Ladders must be secured to the tank and secured to the concrete to allow for tank expansion/contraction due to temperature and loading changes. Use proper chemical resistant materials when anchoring to tank dome or sidewall. See Poly Processing Company's Tank Installation Manual.
 3. All ladders shall be designed to meet applicable OSHA standards. Reference: OSHA 2206; 1910.27; fixed ladders.
- B. Restraint System: (Remove if not required)
1. Metal components to be [galvanized], [stainless steel], or [painted clips], edge softeners, and tension ring with [stainless steel], [galvanized] cables and clamps.
 2. Tank restraint system shall be supplied and the design of same certified by a Structural Engineer registered in the State of tank installation. Design shall conform to the most recent edition of the IBC code for seismic and wind load. Anchor bolts as required by the calculations shall be supplied by the tank manufacturer.
- C. Heat Tracing: (Remove if not required)
1. Heat tracing system for temperature maintenance shall be SilcoPad® tank heating systems designed to maintain a desired product temperature, not to exceed 100 degrees F. Each system shall include tank heating pads and a temperature controller. The quantity and type of SilcoPad® is determined by the size of the tank, the desired temperature maintenance and environmental conditions. Systems shall be available in 30, 60 or 100 degrees F. Tanks are supplied with the heating panels and a controller installed by Poly Processing Company. Power supply to be the only field installation required.
 - a. Pads to operate on 120 vac single phase with a maximum power density of 0.5 watts/sq.inch.
 - b. Silicone pad heaters must fully comply with Article 427-23 (b) of the National Electric Code.
 - c. Temperature controller to be supplied with two electronic thermostats switching the heating system via one solid state relay. Primary thermostat to control desired product temperature and secondary thermostat to provide over temperature protection at 150 degrees F.
- D. Insulation: (Remove if not required)
1. Insulation used shall be polyurethane foam with a density of 2.5 lb/ft³ with a minimum an "R" value of 6.3/in. The foam shall be applied with a nominal thickness of 2" to the external tank surfaces except the tank bottom.

2. Upon completion of application and curing of the insulation, 2 full coverage coats of latex mastic coating shall be applied to the surface of the insulation in such manner as to seal the insulation from the outside environment.

2.05 TANKS:

A. Tank Schedule per the following specifications

Note 1: Approximate overall height is measured along the straight cylindrical portion of the tank and includes the dome top.

B. Fittings

1. Tank fittings shall be according to the fitting schedule in 2.05B above. Threaded fittings shall use American Standard Pipe Threads. If tanks are insulated, fittings shall be installed at the factory prior to application of the insulation.
2. Integrally Molded Flanged Outlet Fittings (IMFO®). These outlets must be an integral part of the tank, molded from the same material as the tank and provide complete drainage of liquid through the sidewall of the tank. Metal and alloy inserts shall not be used.
3. Bolted flange fittings shall be constructed of one 150 lb. flange with ANSI bolt pattern, one flange gasket and stud bolts with gaskets. Stud bolts to have chemical resistant polyethylene injection molded heads and gaskets to provide a sealing surface between the bolt head and the interior tank wall. Stud bolt heads are to be color coded for visual ease of identifying the bolt material by onsite operators. Green- 316 Stainless Steel, Black-Titanium, Red- Alloy C-276, Blue- Monel. All materials shall be compatible with chemical service and as indicated in the fitting schedule above. For NSF/ANSI 61 certification, EPDM or Viton GF gaskets shall be supplied.
4. For sodium hypochlorite and sulfuric acid storage, Bolted One-Piece Sure Seal (B.O.S.S.), double flange fittings constructed of virgin polyethylene shall be supplied. Bolts will be welded to a common backing ring and encapsulated with polyethylene preventing fluid contact with the metal material. Flange will have one full face gasket to provide a sealing surface against inside tank wall. All materials shall be compatible with chemical service and as indicated in the fitting schedule above. For NSF/ANSI 61 certification, EPDM or Viton GF gaskets shall be supplied.
5. Down Pipes and Fill Pipes: Down pipes and fill pipes shall be supported at 6-ft max intervals. Down pipes and fill pipes shall be PVC or material compatible with the chemical stored.
6. U-Vents: Each tank must be vented for the material and flow and withdrawal rates expected. Vents should comply with OSHA 1910.106(F) (iii)(2)(IV)(9). U-vents shall be sized by the tank manufacturer and be furnished complete with insect screen if required (Insect screen lessens the vent capacity by 1/3) in accordance with the venting schedule listed above.
7. All fittings on the 1/3 lower sidewall of tanks with capacities ≥ 1000 gallons shall have 100% virgin PTFE Flexi-joint® expansion joint. Expansion joint to have a minimum of 3 convolutions, stainless steel limit cables and FRP composite flanges. Galvanized parts will not be accepted.

Expansion joint to meet the following minimum performance requirements:

Axial Compression $\geq 0.67''$

Axial Extension $\geq 0.67''$
Lateral Deflection $\geq 0.51''$
Angular Deflection $\geq 14^\circ$
Torsional Rotation $\geq 4^\circ$

2.06 LEVEL INDICATION

- A. Float Indication: The level indicator shall be assembled to the tank and shall consist of PVC float, indicator, polypropylene rope, perforated interior pipe, PVC roller guides, clear UV resistant PVC sight tube EnviroKing® by C.F. Harvel, and necessary pipe supports. The level indicator shall act inversely to the tank contents and shall not allow entrance of tank contents into the sight tube at any time. Indicator shall be neon orange color for visual ease for onsite operators.
- B. Ultrasonic Level Indicator: The ultrasonic level indicator shall be a Flowline ultrasonic level transmitter, level controller with one 4-20 mA or 0-10 VDC continuous level input and NEMA 4X box to be supplied by tank manufacturer.

2.07 FACTORY TESTING

A. Material Testing

- 1. Perform gel and low temperature impact tests in accordance with ASTM D 1998 on condition samples cut from each polyethylene chemical storage tank.
- 2. Degree of Cross-linking. Use Method C of ASTM D 1998- Section 11.4 to determine the ortho-xylene insoluble fraction of cross-linked polyethylene gel test. Samples shall test at no less than 60 percent.

B. Tank Testing

- 1. Dimensions: Take exterior dimensions with the tank empty, in the vertical position. Outside diameter tolerance, including out-of-roundness, shall be per ASTM D 1998. Fitting placement tolerance shall be $\pm 1/2$ -in vertical and ± 1 degree radial.
- 2. Visual: Inspect for foreign inclusions, air bubbles, pimples, crazing, cracking
- 3. Hydrostatic test: Following fabrication, the bottom tanks, including inlet and outlet fittings, shall be hydraulically tested with water by filling to the top sidewall for a minimum of 1 hour and inspected for leaks. Following successful testing, the tank shall be emptied and cleaned prior to shipment.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. The tank shall be shipped upright or lying down on their sides with blocks and slings to keep them from moving. AVOID sharp objects on trailers.

- B. All fittings shall be installed and, if necessary, removed for shipping and shipped separately unless otherwise noted by the contractor.
- C. Upon arrival at the destination, inspect the tank(s) and accessories for damage in transit. If damage has occurred, Poly Processing Company shall be notified immediately.

3.02 INSTALLATION

- A. Install the tanks in strict accordance with Poly Processing Company's Tank Installation Manual and shop drawings.
- B. Installation will be inspected by manufacturer to verify system flexible connections, venting and fittings are properly installed. In addition to on-sight inspection tank system(s) to be reviewed using tank manual check list as supplied by manufacture as listed below.
- C. Manufacturer to provide 1 hour training session to prepare operators to service and maintain the tank system. Included in training session will be (#) training manuals.
- D. Manufacturer's trained technician to do an onsite inspection of installation. Inspection will verify chemical application, plumbing connections, venting, and applicable ancillary equipment such as ladders, restraints, etc. A verification of proper installation certificate will be supplied when equipment passes installation checklist.
- E. Tank manuals will consist of installation check lists, tank drawing(s) as built, fitting drawings referencing nozzle schedule on tank drawing, materials of construction, and recommended maintenance program.

3.03 FIELD TESTING

- A. Poly Processing Company recommends that all tanks be hydro-tested for 24 hours prior to commissioning.

End of Section

SAFE-TANK® DOUBLE WALL TANKS
HIGH DENSITY CROSS-LINKED POLYETHYLENE STORAGE TANKS
NSF/ANSI 61 (Remove if not required)

PART 1-GENERAL

1.01 Requirements

1. The CONTRACTOR shall provide SAFE-Tank® double wall high density cross-linked polyethylene tanks and accessories per section 2.05, complete and in place, in accordance with the Contract Documents.
2. Unit Responsibility: The CONTRACTOR shall be responsible for furnishing the SAFE-Tank® double wall tank(s) and its accessories for chemical storage as indicated.

1.02 REFERENCES, CODES AND STANDARDS

- A. American Society of Testing Materials (ASTM).
- | | |
|----------|---|
| 1. D638 | Tensile Properties of Plastics |
| 2. D883 | Standard Definitions of Terms Relating to Plastics |
| 4. D1505 | Density of Plastics by the Density-Gradient Technique |
| 5. D1693 | ESCR Specification Thickness 0.125" F50-10% Igepal |
| 6. F412 | Standard Terminology Relating to Plastic Piping Systems |
- B. ANSI Standards: B-16.5, Pipe Flanges and Flanged Fittings
- C. Building Code: International Building Code, IBC 2018 / 2021
- D. ARM: Low Temperature Impact Resistance (Falling Dart Test Procedure)
- E. NSF/ANSI Standard 61, AWWA – Drinking Water System Components
- F. ASTM D-1998, Standard Specification for Polyethylene Upright Storage Tanks

1.03 SUBMITTALS

- A. Shop Drawings: Shop drawings shall be approved by the engineer or contractor prior to the manufacturing of the SAFE-Tank® double wall tank(s). Submit the following as a single complete initial submittal.
- Sufficient data shall be included to show that the product conforms to Specification requirements. Provide the following additional information:
1. SAFE-Tank® double wall tank and Fitting Material
 - a. Resin Manufacturer Data Sheet
 - b. Fitting Material
 - c. Gasket style and material
 - d. Bolt material

2. Dimensioned Tank Drawings

- a. Location and orientation of openings, fittings, accessories, restraints and supports.
- b. Details of manways, flexible connections, and vents.

3. Calculations shall be stamped and signed by a registered, third party engineer in the state of the installation.

- a. Tank restraint system. Show seismic and wind criteria.

B. Manufacturer's warranty

C. Manufacturer's unloading procedure (see Poly Processing Company Installation Manual)

A. Manufacturer's installation instructions (see Poly Processing Company Installation Manual)

B. Supporting information on Quality Management System.

C. Supporting documentation of Manufacturer's certification to NSF/ANSI Standard 61 – Drinking Water System Components for water treatment chemicals. (Remove if not required)

A. Manufacturer's Qualifications: Submit to engineer a list of 5 installations in the same service as proof of manufacturer's qualifications.

B. Electrical heat tracing and foam insulation data sheets as required.

I. Factory Test Report

- 1. Wall thickness verification.
- 2. Fitting placement verification.
- 3. Visual inspection
- 4. Impact test
- 5. Gel test
- 6. Hydrostatic test

1.04 QUALITY ASSURANCE

A. The Contractor shall supply SAFE-Tank® double wall tanks of the high density cross-linked polyethylene. Tanks furnished under this Section shall be supplied by Poly Processing Company or approved equal who has been regularly engaged in the design and manufacture of chemical storage tanks for over 10 years.

B. Tanks shall be manufactured from virgin materials.

C. Tanks shall be manufactured from materials certified to NSF/ANSI Standard 61 for chemical storage, and submit form from NSF supporting chemical certification. (Remove if not required)

1.05 WARRANTY

A. The warranty shall be provided upon request for the specific service application. For most chemical applications, Poly Processing Company offers a limited 5 year full replacement warranty. For

Sulfuric Acid, Hydrochloric Acid, and Sodium Hypochlorite the warranty varies. See Poly Processing Company's chemical specific positions and warranty statement.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Tanks shall be rotationally-molded, high density cross-linked polyethylene, double wall, Safe-tank®, flat bottom tanks -. The assembly consists of one cylindrical, closed top inner primary tank and one cylindrical, open top containment outer tank. Each tank is a rotationally molded one-piece seamless constructed tank. The SAFE-Tank® tanks are designed for above-ground, vertical installation and are designed to store approved chemicals at atmospheric pressures. The assembly shall be designed to prevent rainwater and debris from entering the containment tank. Tanks shall be adequately vented as prescribed in Poly Processing Company's Technical Bulletin, Venting-Design for ACFM (air cubic feet per minute). Where indicated, tanks shall be provided with ancillary mechanical fittings and accessories. Tanks shall be marked to identify the manufacturer, date of manufacture and serial numbers must be permanently embossed into the tank.

2.02 MANUFACTURER

- A. Tanks shall be manufactured by Poly Processing Company.

2.03 POLYETHYLENE STORAGE TANKS

- A. Service: Chemical storage tanks shall be suited for the following operating conditions:
- B. High Density Cross-linked Polyethylene resin used in the tank manufacture shall be Poly CL™ or equal and shall contain ultraviolet stabilizer as recommended by resin manufacturer. Where black tanks are indicated, the resin shall have a carbon black compounded into it. The tank material shall be rotationally molded and be a resin that is commercially available at the time of tank manufacture.
- C. For sodium hypochlorite, sulfuric acid, and other oxidizing chemicals, tank resin shall include an antioxidant polyethylene system (OR-1000) with four times the antioxidant properties of a standard polyethylene bonded to the interior surface during the manufacturing process.
- D. **Wall thickness** for a given hoop stress is to be calculated in accordance with ASTM D 1998. In NO case shall the tank thickness be less than design requirements per ASTM D 1998.

- 1. The wall thickness of any cylindrical portion at any fluid level shall be determined by the following equation:

$$T = P \times OD/2SD \text{ or } 0.433 \times SG \times H \times OD/2SD$$

Where:

T	=	wall thickness, in
P	=	pressure, psi
SG	=	specific gravity, gm/cc
H	=	fluid head, ft
OD	=	outside diameter, ft
SD	=	hydrostatic design stress

- a. The minimum wall thickness shall be sufficient to support its own weight in an upright position without external support but shall not be less than 0.187" thick.

2. On closed top tanks the top head shall be integrally molded with the cylindrical wall. Its minimum thickness shall be equal to the thickness of the top of the straight sidewall. In most cases, flat areas shall be provided for attachment of large fittings on the dome of the tank.
3. The bottom head shall be integrally molded with the cylindrical wall. Knuckle radius shall be:

Tank Diameter, ft	Min Knuckle Radius, in
less than or equal to 6	1
greater than 6	1-1/2

4. Tanks with 3000 gal capacity or larger shall have at least 3 lifting lugs. Lugs shall be designed for lifting the tank when empty.
 - a. Unless otherwise indicated by Contract drawings, for indoor pneumatic fill, manways shall be 24-in diameter or greater and equipped with an emergency pressure relief device or SAFE-Surge™ Manway with pressure relief at 6" water column to prevent over-pressurization. The SAFE-Surge manway shall be chemically compatible with the chemical being stored. Gaskets shall be closed cell, cross-linked polyethylene foam, Viton, or EPDM materials.
 - b. Unless otherwise indicated by Contract drawings, for outdoor pneumatic fill, manways shall be 24-in diameter or greater and equipped with Poly Processing Company's F.S.2650® combined manway and vent to prevent over pressurization of tank. Manway must be capable of relieving a volume flow rate of up to 2650 ACFM. Gaskets shall be closed cell, cross-linked polyethylene foam, Viton, or EPDM materials.
 - c. Unless otherwise indicated, tanks less than 2000 gallons in non-pneumatic applications shall have a manway cover 17-in or smaller of Polyethylene material with a coarse thread. Gaskets shall be closed cell, cross-linked polyethylene foam, viton or EPDM materials.

NOTE: Tanks must be vented to allow for performance at atmospheric pressure, in accordance with the following matrix:

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	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

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

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- E. Tank colors shall be natural (un-pigmented), black (compounded), or as specified by the ENGINEER with written agreement by the tank manufacturer.

2.04 TANK ACCESSORIES

- A. Ladder: (Remove if not required)

1. [Painted carbon steel], [fiberglass], [galvanized carbon steel] or [stainless steel] access ladders shall be provided with the polyethylene chemical storage tanks at locations as shown. Safety cages shall be added to ladders as required, per OSHA.
 2. Ladders must be secured to the tank and secured to the concrete to allow for tank expansion/contraction due to temperature and loading changes. Use proper chemical resistant materials when anchoring to tank dome or sidewall. See Poly Processing Company's Tank Installation Manual.
 3. All ladders shall be designed to meet applicable OSHA standards. Reference: OSHA 2206; 1910.27; fixed ladders.
- B. Restraint System: (Remove if not required)
1. Metal components to be [galvanized], [stainless steel], or [painted clips], edge softeners, and tension ring with [stainless steel], [galvanized] cables and clamps.
 2. Tank restraint system shall be supplied and the design of same certified by a Structural Engineer registered in the State of tank installation. Design shall conform to the most recent edition of the IBC code for seismic and wind load. Anchor bolts as required by the calculations shall be supplied by the tank manufacturer.
- C. Heat Tracing (Remove if not required)
1. Heat tracing system for temperature maintenance shall be SilcoPad® tank heating systems designed to maintain a desired product temperature, not to exceed 100 degrees F. Each system shall include tank heating pads and a temperature controller. The quantity and type of SilcoPad® is determined by the size of the tank, the desired temperature maintenance and environmental conditions. Systems shall be available in 30, 60 or 100 degrees F. Tanks are supplied with the heating panels and a controller installed by Poly Processing Company. Power supply to be the only field installation required.
 - a. Pads to operate on 120 vac single phase with a maximum power density of 0.5 watts/sq.inch.
 - b. Silicone pad heaters must fully comply with Article 427-23 (b) of the National Electric Code.
 - c. Temperature controller to be supplied with two electronic thermostats switching the heating system via one solid state relay. Primary thermostat to control desired product temperature and secondary thermostat to provide over temperature protection at 150 degrees F.
- D. Insulation: (Remove if not required)
1. Insulation used shall be polyurethane foam with a density of 2.5 lb/ft³ with a minimum an "R" value of 6.3/in. The foam shall be applied with a nominal thickness of 2" to the external tank surfaces except the tank bottom.
 2. Upon completion of application and curing of the insulation, 2 full coverage coats of latex mastic coating shall be applied to the surface of the insulation in such manner as to seal the insulation from the outside environment.

2.05 TANKS:

A. Tank Schedule per the following specifications

Note 1: Approximate overall height is measured along the straight cylindrical portion of the tank and includes the dome top.

B. Fittings

1. Tank fittings shall be according to the fitting schedule in 2.05B above. Threaded fittings shall use American Standard Pipe Threads. If tanks are insulated, fittings shall be installed at the factory prior to application of the insulation.
2. Bolted flange fittings shall be constructed of one 150 lb. flange with ANSI bolt pattern, one flange gasket and stud bolts with gaskets. Stud bolts to have chemical resistant polyethylene injection molded heads and gaskets to provide a sealing surface between the bolt head and the interior tank wall. Stud bolt heads are to be color coded for visual ease of identifying the bolt material by onsite operators. Green- 316 Stainless Steel, Black-Titanium, Red- Alloy C-276, Blue- Monel. All materials shall be compatible with chemical service and as indicated in the fitting schedule above. For NSF/ANSI 61 certification, EPDM or Viton GF gaskets shall be supplied.
3. For sodium hypochlorite and sulfuric acid storage, Bolted One-Piece Sure Seal (B.O.S.S.), double flange fittings constructed of virgin polyethylene shall be supplied. Bolts will be welded to a common backing ring and encapsulated with polyethylene preventing fluid contact with the metal material. Flange will have one full face gasket to provide a sealing surface against inside tank wall. All materials shall be compatible with chemical service and as indicated in the fitting schedule above. For NSF/ANSI 61 certification, EPDM or Viton GF gaskets shall be supplied.
4. Down Pipes and Fill Pipes: Down pipes and fill pipes shall be supported at 6-ft max intervals. Down pipes and fill pipes shall be PVC or material compatible with the chemical stored.
5. U-Vents: Each tank must be vented for the material and flow and withdrawal rates expected. Vents should comply with OSHA 1910.106(F)(iii)(2)(IV)(9). U-vents shall be sized by the tank manufacturer and be furnished complete with insect screen if required (Insect screen lessens the vent capacity by 1/3) in accordance with the venting schedule listed above.
6. On dual wall tank(s) greater than 1000 gallons, bottom fitting(s) must be designed to maintain 110% secondary containment integrity. Bottom containment fitting must include PTFE expansion joint designed to accommodate movement of primary tank in design accordance with ASTM-D 1998 tolerances. All secondary containment fittings and parts shall be resistant to chemical fume corrosion. Fitting shall include the option to connect a secondary containment pipe over primary pipe.
7. All fittings on the 1/3 lower sidewall of tanks with capacities $\geq$ 1000 gallons shall have 100% virgin PTFE Flexijoint® expansion joint. Expansion joint to have 3 convolutions, stainless steel limit cables, FRP composite flanges and meet the following minimum performance specifications. Galvanized parts will not be accepted.

Expansion joints to meet the following minimum performance requirements:

Axial Compression $\geq$ 0.67"

Axial Extension $\geq$ 0.67"

Lateral Deflection $\geq$ 0.51"

Angular Deflection $\geq 14^\circ$
Torsional Rotation $\geq 4^\circ$

2.06 LEVEL INDICATION (Remove if not required)

- A. Float Indication: The level indicator shall be assembled to the tank and shall consist of PVC float, indicator, polypropylene rope, perforated interior pipe, PVC roller guides, clear UV resistant PVC sight tube EnviroKing® by C.F. Harvel, and necessary pipe supports. The level indicator shall act inversely to the tank contents and shall not allow entrance of tank contents into the sight tube at any time. Indicator shall be neon orange color for visual ease for onsite operators.
- B. Ultrasonic Level Indicator: The ultrasonic level indicator shall be a Flowline ultrasonic level transmitter, level controller with one 4-20 mA or 0-10 VDC continuous level input and NEMA 4X box to be supplied by tank manufacturer.

2.07 FACTORY TESTING

A. Material Testing

- 1. Perform gel and low temperature impact tests in accordance with ASTM D 1998 on condition samples cut from each polyethylene chemical storage tank.
- 2. Degree of Crosslinking. Use Method C of ASTM D 1998- Section 11.4 to determine the ortho-xylene insoluble fraction of cross-linked polyethylene gel test. Samples shall test at no less than 60 percent.

B. Tank Testing

- 1. Dimensions: Take exterior dimensions with the tank empty, in the vertical position. Outside diameter tolerance, including out-of-roundness, shall be per ASTM D 1998. Fitting placement tolerance shall be +/- 1/2-in vertical and +/- 1 degree radial.
- 2. Visual: Inspect for foreign inclusions, air bubbles, pimples, crazing, cracking, and delamination.
- 3. Hydrostatic test: Following fabrication, the bottom tanks, including inlet and outlet fittings, shall be hydraulically tested with water by filling to the top sidewall for a minimum of 1 hour and inspected for leaks. Following successful testing, the tank shall be emptied and cleaned prior to shipment.

PART 3 - EXECUTION

3.01 DELIVERY, STORAGE, AND HANDLING

- A. The tank shall be shipped upright or lying down on their sides with blocks and slings to keep them from moving. AVOID sharp objects on trailers.
- B. All fittings shall be installed and, if necessary, removed for shipping and shipped separately unless otherwise noted by the contractor.
- C. Upon arrival at the destination, inspect the tank(s) and accessories for damage in transit. If damage has occurred, Poly Processing Company shall be notified immediately.

3.02 INSTALLATION

- A. Install the tanks in strict accordance with Poly Processing Company's Tank Installation Manual and shop drawings.
- B. Installation will be inspected by manufacturer to verify system flexible connections, venting and fittings are properly installed. In addition to on-sight inspection tank system(s) to be reviewed using tank manual check list as supplied by manufacture as listed below.
- C. Manufacturer to provide 1 hour training session to prepare operators to service and maintain the tank system. Included in training session will be (#) training manuals.
- D. Manufacturer's trained technician to do an onsite inspection of installation. Inspection will verify chemical application, plumbing connections, venting, and applicable ancillary equipment such as ladders, restraints, etc. A verification of proper installation certificate will be supplied when equipment passes installation checklist.
- E. Tank manuals will consist of installation check lists, tank drawing(s) as built, fitting drawings referencing nozzle schedule on tank drawing, materials of construction, and recommended maintenance program.

3.03 FIELD TESTING

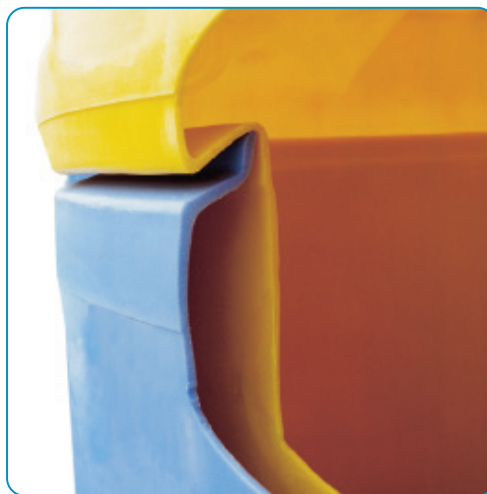
- A. Poly Processing Company recommends that all tanks be hydro-tested for 24 hours prior to commissioning.

End of Section

Rev. 3-30-17

SAFE-TANK® Double Wall Tank System

A complete double wall system for secondary containment.



Poly Processing's SAFE-Tank® double wall tank system, is a "tank-within-a-tank" that provides secondary containment to avoid the damaging of equipment or property, loss of chemical, or injury to employees in the event of a spill. The tank is designed to keep contaminants from entering the interstitial area.

The SAFE-Tank® Double Wall Tank System:

- Provides 110% double wall secondary containment.
- Will equalize in the event of a primary tank issue and allow the tank system to be continually used until the operator has time to address the issue.
- Is ideal for chemicals like sulfuric acid that can have dangerous exothermic reactions to water.
- Eliminates the expense, cost and maintenance of secondary concrete containment.
- Minimizes the system's footprint by providing secondary containment in a more compact way.
- Adding an enhanced bellows transition fitting will maximize your SAFE-Tank® double wall tank system's performance.

SAFE-Tank® double wall tank systems are also available with the OR-1000™ system for superior antioxidant resistance.

CALIFORNIA
8055 S. Ash St.
French Camp, CA 95231

LOUISIANA
P.O. Box 4150
2201 Old Sterlington Rd.
Monroe, LA 71203
Tel: 800.523.9871
sales@polyprocessing.com

VIRGINIA
161 McGhee Rd.
Winchester, VA 22603

SAFE-Tank® SYSTEMS – STORAGE & CONTAINMENT

		Stock Number	F.O.B	Nominal Capacity	Approx. O.D.	Approx. Overall Height	Lid Size	Ladder Height
		2008700	LA					
		2110150	LA					
L	•	Assembly	LA	8,700	11'-11"	14'-10 1/2"	24"	15'
		2006650	CA, LA					
		2107450	CA, LA					
L	•	Assembly	CA, LA	6,650	10'-2"	14'-9 1/2"	24"	14'
		2005400	LA					
		2106300	LA					
L	•	Assembly	LA	5,400	11'-11"	10'-1/2"	24"	10'
		2004400	VA					
		2104950	VA					
L	•	Assembly	VA	4,400	10'-3"	10'-4 1/4"	24"	10'
		2004350	CA					
		2104950	CA					
L	•	Assembly	CA	4,350	10'-3"	10'-4 1/4"	24"	10'
		2003150	LA					
		2103550	LA					
L	•	Assembly	LA	3,150	10'-2"	8'-1 1/2"	24"	7'
		2002500	LA					
		2103100	LA					
L	•	Assembly	LA	2,500	8'-0"	10'-5 3/4"	17"	10'
		2001550	VA					
		2101950	VA					
	•	Assembly	VA	1,550	8'-0"	7'-5 3/4"	17"	7'
		2001015	CA					
		2101200	CA					
	•	Assembly	CA	1,015	6'-5"	7'-1/2"	17"	6'
		2001000	VA					
		2101200	VA					
	•	Assembly	VA	1,000	6'-5"	7'-1/2"	17"	6'
		2000750	CA, VA					
		2100940	CA, VA					
	•	Assembly	CA, VA	750	5'-0"	8'-2 1/2"	17"	7'
		2000540	LA					
		2100655	LA					
	•	Assembly	LA	540	6'-5"	4'-5 3/4"	17"	
		2000410	CA					
		2000440	CA					
		Assembly	CA	400	4'-0"	6'-1/2"	10"	
		2000405	CA, VA					
		2100445	CA, VA					
		Assembly	CA, VA	405	4'-0"	6'-1/2"	7"	
		2000250	CA, VA					
		2100295	CA, VA					
		Assembly	CA, VA	250	3'-11"	4'- 5 1/4"	7"	
		2000160	CA, LA, VA					
		2100220	CA, LA, VA					
		Assembly	CA, LA, VA	160	3'-0"	5'-3"	7"	
		2000105	CA, LA, VA					
		2100150	CA, LA, VA					
		Assembly	CA, LA, VA	105	3'-0"	3'-10 3/4"	7"	
		2000055	LA					
		2100085	LA					
		Assembly	LA	55	3'-0"	2'-8"	7"	

INNOVATIVE TANK SOLUTIONS

IMFO®: integrally molded for major hazard control.



Traditional tank maintenance can be a challenge with many chemicals – so Poly has developed a unique system that helps minimize the hazards associated with traditional vertical tank maintenance. With Poly's Integrally Molded Flanged Outlet, or IMFO® system, the flange is molded while the tank is processing, making it a stress-free part of the tank. The flange is created from the same material as the tank – it's not an insert introduced during or at post-production.

The IMFO's advantages are many:

- Since the flange is at the bottom of the tank, full drainage / discharge is achieved below the tank knuckle radius, which can eliminate the need to enter the tank for cleaning.
- One-piece construction enhances long-term performance of the tank, since it doesn't compromise the tank hoop's integrity or structural design.
- In aggressive applications, the complete flange face is protected by the antioxidant OR-1000™ system.
- The IMFO's design brings you the highest amount of static head pressure, which contributes to the highest net positive suction head (NPSH) of any vertical non-coned tank.

California
8055 S. Ash St.
French Camp, CA 95231

Louisiana
P.O. Box 4150
2201 Old Sterlington Rd.
Monroe, LA 71203
Tel: 866.765.9957
www.polyprocessing.com

Virginia
161 McGhee Rd.
Winchester, VA 22603

VERTICAL TANKS WITH IMFO®

VERTICAL TANKS WITH IMFO®

		Stock Number	Nominal Capacity	Approx. O.D.	Approx. Overall Height	Lid Size	IMFO® Size	Ladder Height
L	•	1115500	15,500	13'-9"	16'-5"	24"	4"	16'
L	•	1113650	13,650	13'-9"	14'-7"	24"	4"	14'
	•	1112200	12,200	12'-0"	16'-7 3/4"	24"	4"D	17'
	•	1112150	12,150	12'-0"	17'-3/4"	24"	4"	17'
	•	1110300	10,300	12'-0"	14'-5 1/4"	24"	4"	14'
L	•	1110150	10,150	11'-11"	14'-4 3/4"	24"	4"	14'
L	•	1108500	8,500	10'-0"	16'-8 1/2"	24"	4"	17'
L	•	1108100	8,100	11'-11"	11'-10"	24"	4"	12'
L	•	1108050	8,050	10'-0"	16'-1"	24"	4"	15'
L	•	1107300	7,300	10'-2"	14'-1 3/4"	24"	4"	14'
L	•	1106650	6,650	11'-11"	10'-1/2"	24"	4"	13'
L	•	1106600	6,600	10'-0"	13'-6 1/2"	24"	4"	13'
L	•	1106150	6,150	10'-2"	12'-4 3/4"	24"	4"	12'
L	•	1106115	6,115	8'-6"	16'-3 3/4"	24"	4"D	16'
L	•	1106100	6,100	10'-0"	12'-7 1/2"	24"	4"	12'
L	•	1105050	5,050	7'-10"	16'-1/4"	24"	4"D	16'
L	•	1104600	4,600	10'-2"	9'-6 3/4"	24"	4"	9'
L	•	1104300	4,300	11'-11"	7'-1 1/4"	24"	4"	7'
L	•	1104150	4,150	8'-6"	12'-6 1/4"	24"	3"	12'
L	•	1104050	4,050	8'-2"	12'-8 3/4"	24"	3"	12'
L	•	1103900	3,900	7'-10"	12'-8 1/4"	24"	4"D	12'
L	•	1103000	3,000	7'-1"	11'-11 3/4"	24"	3"	12'
L	•	1102750	2,750	8'-2"	9'-2 1/2"	24"	3"	9'
L		1102560	2,560	7'-1"	10'-3 1/2"	24"	3"	10'
L	•	1102550	2,550	7'-1"	10'-3 1/2"	24"	3"	10'
L		1102050	2,050	7'-1"	8'-5 3/4"	24"	3"	8'
L	•	1102000	2,000	7'-1"	8'-5 3/4"	24"	3"	8'
		1101600	1,600	6'-1"	9'-1"	17"	3"	9'
		1101400	1,400	5'-4"	10'-1 1/2"	17"	3"	
		1101250	1,250	5'-0"	9'-11 1/2"	17"	3"	
		1101150	1,150	5'-4"	8'-6"	17"	3"	
		1100905	905	5'-4"	6'-11 1/2"	17"	2"	
		1100545	545	4'-0"	7'-1 1/2"	17"	2"	
		1100475	475	4'-0"	6'-3 1/4"	17"	3"	
		1100325	325	4'-0"	4'-7 1/2"	17"	3"	
		1100230	230	3'-2"	4'-10 3/4"	17"	3"	
		1100200	200	2'-7"	6'-3"	7"	2"	

SLOPED BOTTOM VERTICAL TANK WITH IMFO®

		Stock Number	Nominal Capacity	Approx. O.D.	Approx. Overall Height	Lid Size	IMFO® Size	Ladder Height
L	•	1215000	15,000	13'-9"	16'-5"	24"	4"	16'
L	•	1213200	13,200	13'-9"	14'-7"	24"	4"	14'
	•	1211800	11,800	12'-0"	16'-4"	24"	4"	15'
L	•	1209850	9,850	12'	14'-1 1/2"	24"	4"	15'
	•	1208500	8,500	12'-0"	12'-7"	24"	4"	10'
L	•	1206350	6,350	10'-2"	12'-10 3/4"	24"	4"	13'
L	•	1206250	6,250	10'-0"	13'-0"	24"	4"	12'
L	•	1204200	4,200	8'-2"	13'-5"	24"	3"	12'
L	•	1204100	4,100	8'-6"	12'-7 3/4"	24"	3"	13'
L	•	1203950	3,950	10'-0"	9'-1"	24"	4"	8'



POLYBASE® TANK SYSTEM

PolyBase IMFO and Sloped Bottom IMFO support systems are available for all Vertical Tanks with IMFO and Sloped Bottom Tanks with IMFO. Please go to www.polyprocessing.com/polybase or contact Poly Processing Company for your PolyBase needs.



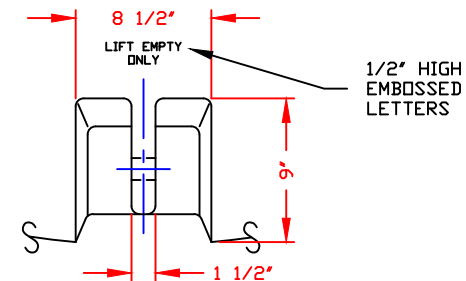
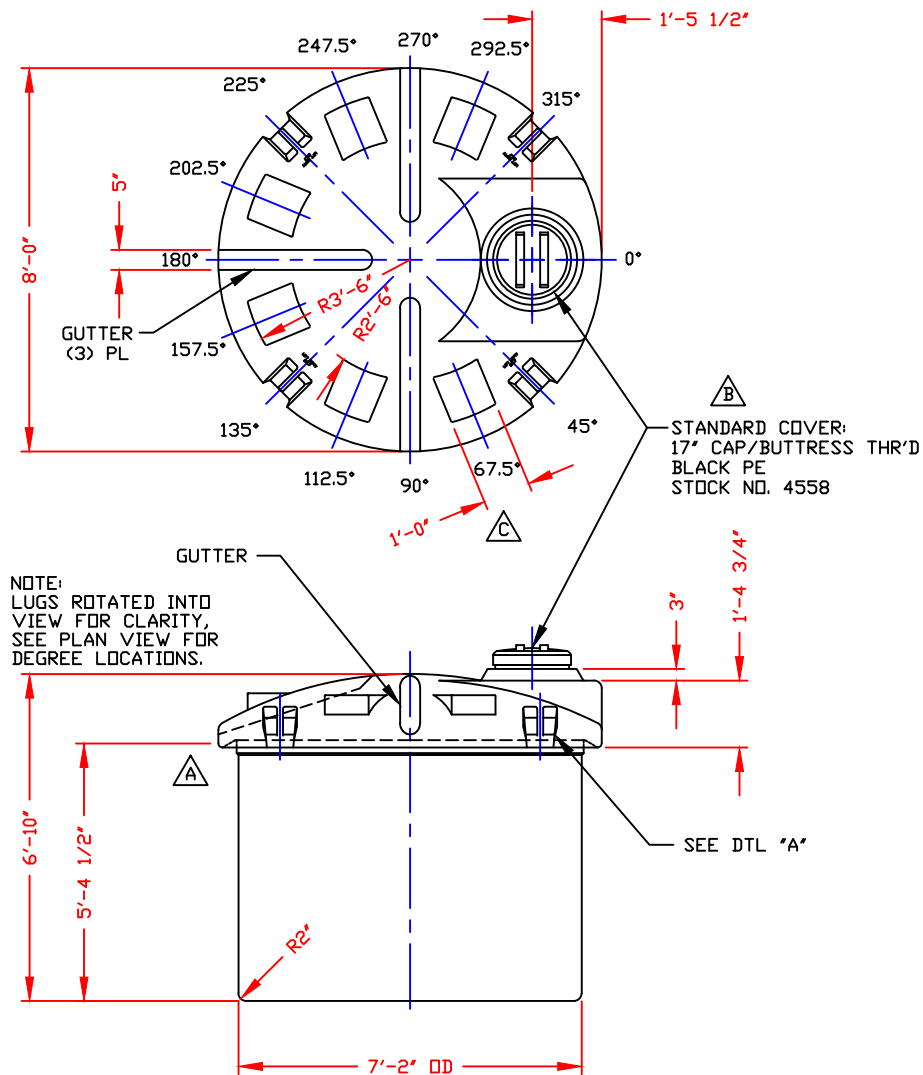
• = Molded-in lifting lugs
L = Molded-in ladder attachment lugs

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SOLUTIONS, SIMPLIFIED.

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NOTE:
 ALL HIDDEN LINES ARE NOT SHOWN.
 SOME ARE SHOWN FOR CLARITY.

NOZZLE SCHEDULE & ACCESSORIES					
SERVICE	MK	STOCK NO.	SIZE	FITTING	DEG ELEV



DETAIL "A"
 SCALE: 1 1/2"=1'-0"

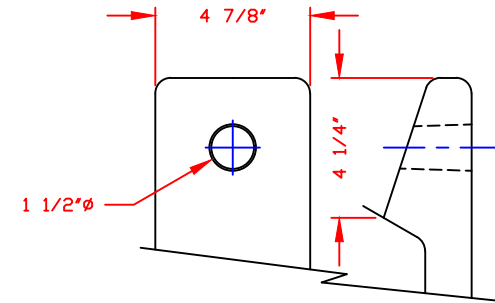
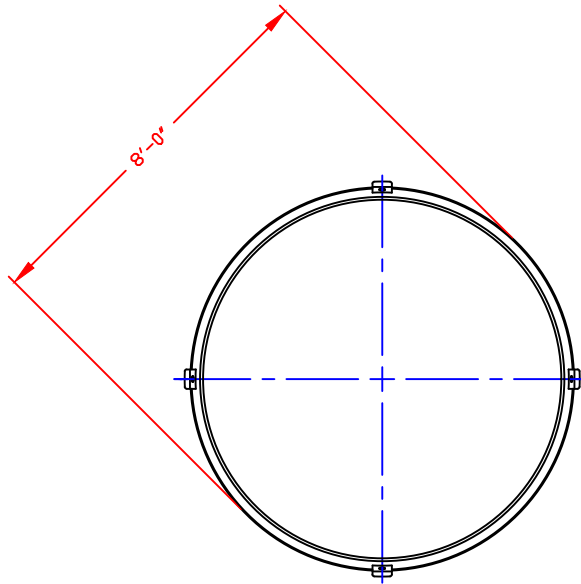
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CALCULATED CAPACITIES/ VOLUME IN U.S. GALLONS		
DESIGN CAP	DOME VOL	TOTAL VOL
1586	204	1790

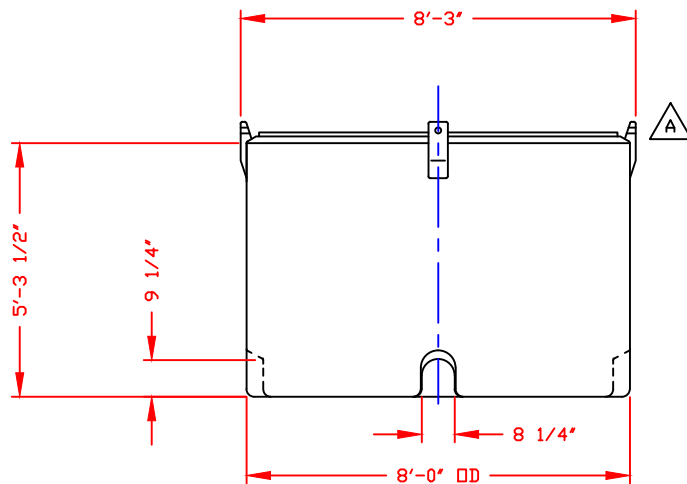
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DWG TITLE				
1550 GALLON INNER SAFE-TANK				
SCALE:	3/8"=1'-0"	 POLYPROCESSING SOLUTIONS. SIMPLIFIED.	Central Region P.O. Box 4050 07110 2001 Old Swanton Rd. Harrison, LA 71303 CSD 343-7563 FAX CSD 343-0795	DR: B. HARPER
DATE:	09/13/19		CK:	
		SHEET	COMPUTER FILE	REV
		1 OF 1	SAFE-I-01550	C

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LUG DETAIL
 SCALE: 1 1/2" = 1'-0"



NOTE:
 MUST USE FLEXIBLE
 CONNECTIONS ALL
 LOWER SIDEWALL
 FITTINGS

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CALCULATED CAPACITY
 VOLUME IN U.S. GALLONS
 DESIGN CAPACITY
 1954

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DWG TITLE 1550 GALLON OUTER SAFE-TANK/ 1950 OPEN TOP TANK			
SCALE: 3/8"=1'-0"	 Central Region P.O. Box 4150 71821D 8001 Old Sterlington Rd. Norcross, LA 71055 CUB 343-7865 FAX CUB 343-8790	DR: B. HARPER	
DATE: 09/13/19		CK:	
REV "B" ADDED FITTING NOTE BY:MBW 4/16/03 CK:JB REV "A" MODIFICATION TO MOLD BY:MBW 3/21/02 CK:BT		SHEET 1 OF 1	COMPUTER FILE SAFE-O-01550
		REV B	



Installation, Operation, And Maintenance Manual

Thank you for making us your chosen tank supplier!

Over 50 years in the tank business has taught us that proper installation, operation, and maintenance is the key to longer useful life of a tank system. Please read all of the instructions contained in this manual. It will make a tremendous difference in the useful life of your tank. The tank owner is responsible for using the current PPC Installation, Operation, and Maintenance Manual. The current version can be found at www.polyprocessing.com/installguide.

Revision 1-25. Please check for the latest revision to this manual at www.polyprocessing.com/installguide



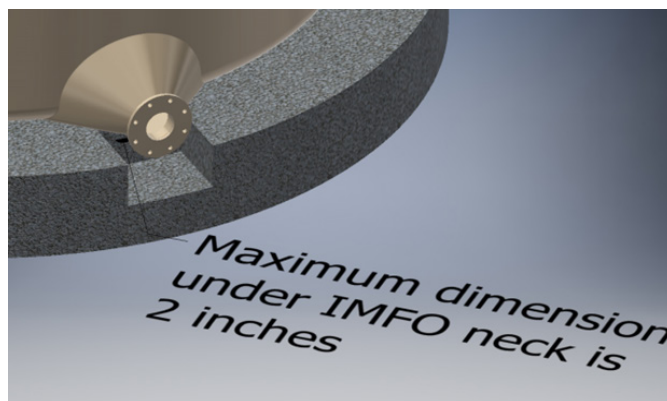
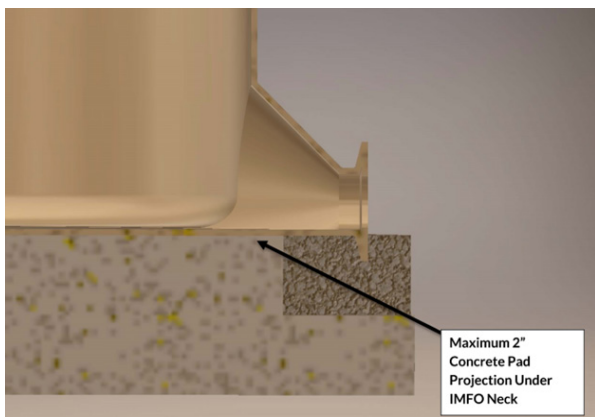
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GENERAL INFORMATION

- Installation Videos: Please visit <https://www.polyprocessing.com/technical-resources/video-library/> for installation videos and a current version of the Operation and Maintenance Manual.
- 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. Make sure all fittings are tightened using the factory recommended torque values and techniques.
- 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-in nominal thickness, density range 2 – 2.8 lbs. /cubic foot, R value ≥ 6.3 / inch, mastic coating is white acrylic vinyl.
- Nominal / Working Capacity: Calculated vertical tank capacity is to top of straight side- wall.
- 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 26) 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 PolyBase, a polyurethane PolyBase or a monolithic concrete pad with finished edges to elevate bottom of tank above primary floor surface. The pad must be at least 4” in 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 with no more than 2” of projection under the IMFO neck at the cutout or notch to prevent stress on the IMFO fitting. Use a polyurethane PolyBase or a concrete pad when storing fluids with a specific gravity greater than 1.65. (See 3D drawing on next page)
- General guidelines to accommodate restraint clips and ladders:

- Make foundation 2-ft 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. Make sure the IMFO neck is supported and the maximum concrete pad projection is 2” under the IMFO neck. (See pictures below) Make sure there are no valves or heavy piping hanging off the IMFO.



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.

Mechanical Pump Fill	Pneumatic Fill								
IF ≤ 1,000 gallons	IF – Vent length ≤ 3'			IF – Vent length > 3' and ≤ 30'			IF – Scrubber or fume tight application		
✓ Vent size should equal size of largest fill or discharge fitting	✓ Maintain vent screen mesh size ≥ ¼" or no screen used			✓ 3 or less 90° elbows with no other restrictions or reduction in pipe size			✓ Vent pipe size throughout scrubber system CANNOT be reduced!		
	✓ Emergency Pressure Relief Cover Required IF > 1,000 gallons			✓ Emergency Pressure Relief Cover Required IF > 1,000 gallons			✓ Centerline of dispersion pipe not to be submersed > 6"		
							✓ Perforated dispersion pipe must be same diameter as vent or larger. Sum of perforations ≥ cross-sectional area of pipe		
IF > 1,000 gallons	Tanker Discharge	Inlet/Fitting Size	Minimum Vent Size	Tanker Discharge	Inlet/Fitting Size	Minimum Vent Size	Tanker Discharge	Inlet/Fitting Size	Minimum Vent Size
✓ Vent size should exceed the largest fill or discharge fitting by 1"	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"

» See our website for Detailed Venting Guidelines.

» Venting chart based on recommendation and criteria from Venting Design for ACFM Technical Paper

Two 2-inch vents DO NOT EQUAL 4-inch venting capacity.

For detailed venting guidelines, please visit: www.polyprocessing.com/venting

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 25). Shield all fittings, valves, and piping from physical impact 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.

RECEIVING MERCHANDISE

RECEIVING:

Inspect immediately upon receipt for obvious damage, defects, or missing parts and accessories.

Parts and accessories are often secured boxed and shipped loose from 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.

It's common to store tanks for a period of time before installation. Often, loose or boxed parts are misplaced or used for something else on site. We recommend clearly marking any loose or boxed parts for the chemical storage tank only. Store boxes in a safe location where they can be easily found and retrieved.

- Tanks can sit in direct sunlight, but a tarp or cover will help keep them clean
- Store tanks out of traffic areas, including forklift traffic, so they don't get gouged
- IMFO tanks or Sloped Bottom IMFO tanks need a 4 x 4 block under the IMFO (molded outlet) so that it does not rest directly on the ground.

RETURNING MERCHANDISE

To return **unused** 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.

TANK LOCATION

Locate the Tank wisely:

- Minimal employee and equipment traffic near tank
- Safe distance away from heat and flames
- Ease of future maintenance and inspection
- Ability to remove and replace the tank cost effectively in the future, i.e. Do not trap/confine the tank(s) in a building or by other equipment
- Provide flat, level and smooth monolithic foundation, adequate for the weight of the 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

OFF-LOADING 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, which could cause a dangerous fall. The tank dome is not load rated, as it is not required per ASTM D D1998-06; therefore, it

cannot be guaranteed that the top of the dome can support the weight of personnel.

Whether unloading or moving, the tank must be fully drained before lifting.

Poly Processing strongly recommends using a licensed and experienced construction rigger to offload and set the tanks safely.

Use of Lifting Lugs: (If the tank doesn't have molded in or bolted on lifting lugs refer to page 8 regarding using the manway to offload the tank)

- 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



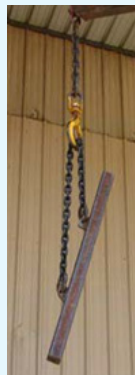
2 LUGS = 1 SET

- Position the boom of the crane directly over the centerline of the tank lying on its side near the dome (top). Use all lifting lug sets as the lift points (the holes in the lifting lugs have a 1-3/8-in diameter and are spaced 8-in from side to side). Use a shackle with a threaded pin to connect through each eyelet of the lifting lug. Make sure the shackle with pin is large enough to take up as much of the hole as possible to improve lifting control. Ensure each shackle with bolt and cable have a lifting capacity of a minimum 3000 pounds. (INSULATED TANKS: Extreme care should be taken to ensure that during the attachment of the bolts and cables from the boom position to the lifting lugs, none come in contact with the tank, causing damage to the foam surface. To prevent this from happening, attach pieces of cardboard to the dome, near the lifting lug positions to protect the sensitive surface area from any contact during the lifting process. Once you have confirmed that all Lifting Lugs are properly attached and the slack in the cables have been removed, it is now an appropriate time to cut away the protective wrap and wooden cradle before starting the lifting process)
- Slowly begin to raise the tank into an upright position. Take extreme care in balancing the weight of the tank. (INSULATED TANKS: The bottom portion of the foam area of the tank base will be crushed if it is allowed to tilt and sit on its own weight)
- Once the tank is positioned in its upright position, lift it up and lower the tank back onto the bed of the trailer. This will remove the tension from the cables temporarily to provide the opportunity to reposition the clamps and cables and find the true balance point positions. (INSULATED TANKS: Remove protective wrap and wooden cradle and discard)
- Raise the boom slowly until all slack has been removed from all lifting cables and you are assured the weight of the tank is now balanced. Lift the tank high enough to clear the trailer. You are now positioned to transport the tank to its final position.
- **IMPORTANT NOTE:** If the tank has an IMFO, before it is allowed to sit flat on its own weight at any point during the off-loading process, a block (preferably a 12-in 4x4) must be set underneath the IMFO base to keep it off the ground. This is necessary to keep the IMFO from being damaged (by design,

it sits lower than the flat bottom of the tank).

Use of Manway: Poly Processing strongly recommends the use of lifting lugs or truck straps underneath the tank to lift the tank. We also If those are not available, then the following applies.

- Use a lifting device as shown below. The bar should be a minimum 3-in in diameter, have adequate strength for the load, and range in length from 42-in to 46-in.
- 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.
- Insert the forklift tines into the long side of the tank (either from the dome or floor) to achieve a balance point. Lift the tank off the bed of the truck. Back away from the truck slowly, as the weight of the tank and the cradle are both very heavy. Be prepared to stop and adjust your load if need be.
- Slowly set the tank onto the floor in an unobstructed, flat area that allows for the forklifts to move around as needed.
- Set (3) or (4) 4x4 blocks on the floor in a pattern of the outside radius of the tank. This will aid in temporarily allowing the tank to be elevated off the ground to allow the forks to get underneath for transporting the tank to its final position.
- Station another forklift on the opposite side of the tank. This forklift is used so the tank will not tip forward or rock back and forth and is used as a safety measure to catch the tank as it is stood up. Using cardboard sleeves or other protective methods, wrap the ends of the forks to prevent the tank from being gouged in the event the forks touch the tank as it is being stood up. Raise and widen the fork spacing to straddle the outside radius of the tank.
- Set tank upright over the blocks so the tank is positioned, and the weight is equally distributed. Insert the forks of one of the lifts under the bottom of the tank and lift the tank slowly, just enough to clear the blocks, and transport the tank to the desired location, slowly.

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.



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.

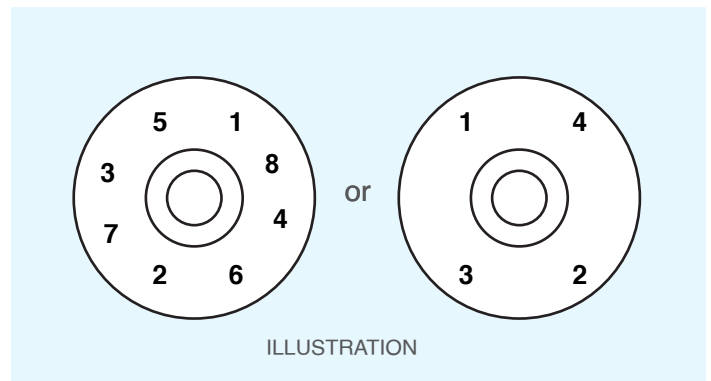
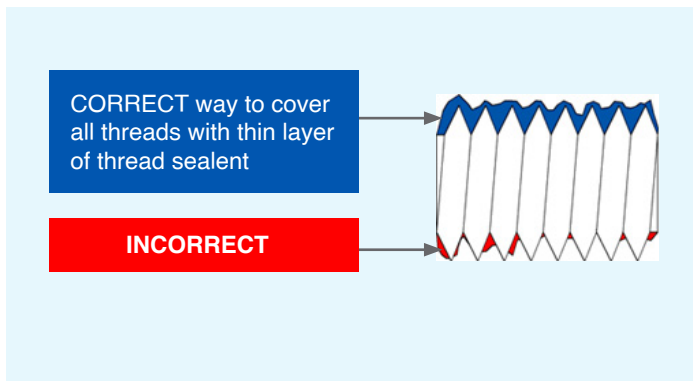
RECOMMENDED TORQUE VALUES AND TECHNIQUES

ALWAYS

1. Lubricate bolts with anti-seize compound prior to installing nuts.
2. Tighten the nuts in a crisscross pattern using a calibrated 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 Bulkhead	25 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 (This may vary slightly)
External Pipe Support Bolt	15-20 ft. lbs.

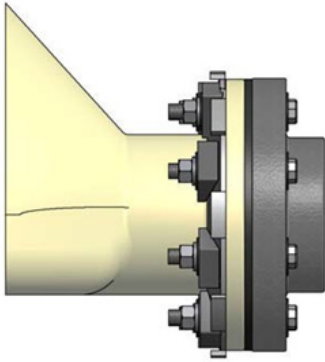
- Method for applying thread sealant to threaded fittings:
- The following tightening sequence is suggested for the flange bolts



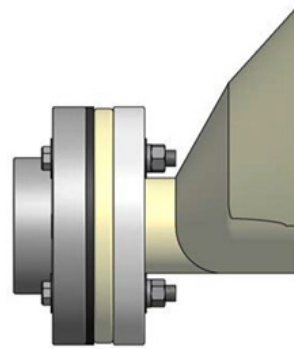
IMFO® FLANGE FITTING ASSEMBLY

The IMFO® (Integrally Molded Flanged Outlet) is assembled at the PPC plant sites and hydro tested to ensure proper seal.

There are two types of IMFO® back up rings.



Tapered IMFO® w/ Stainless Steel Back-up Ring



Original IMFO® w/ PVC Back-up Ring

DO NOT disassemble the factory installation. If field replacement is necessary, use picture and exploded view on the next page as a guide. Make sure the fittings are tightened using the factory recommended torque values and techniques.

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.

Make sure the IMFO neck is supported and there are no valves or heavy piping hanging off the IMFO.
See Tank Foundation under General Information.

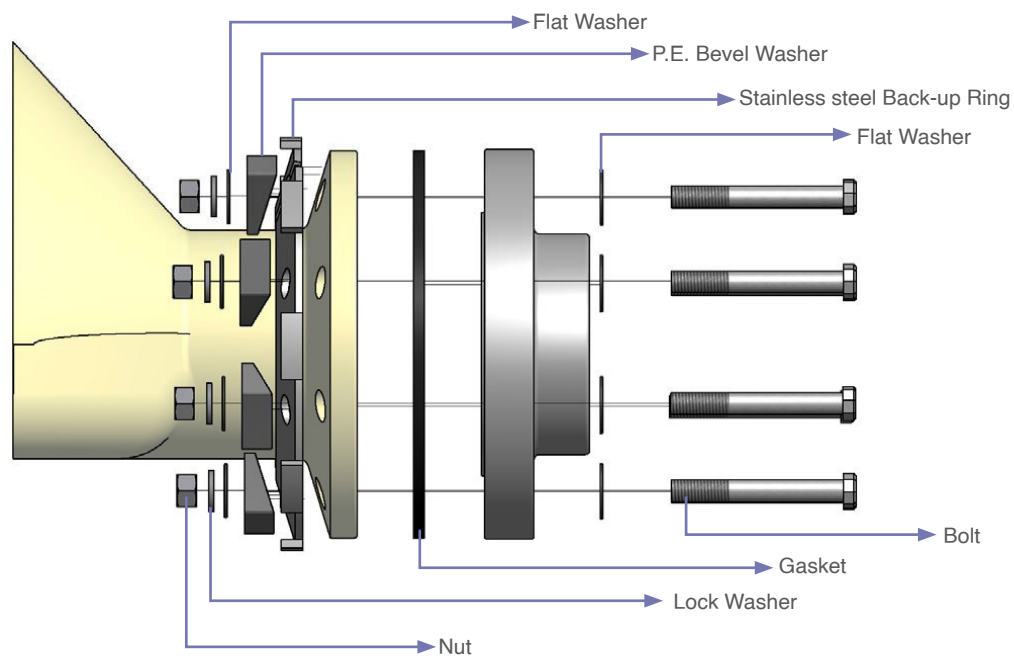
Note: Installing a butterfly valve on the IMFO fitting may require a spool assembly for a proper seal. Contact the factory for more information.



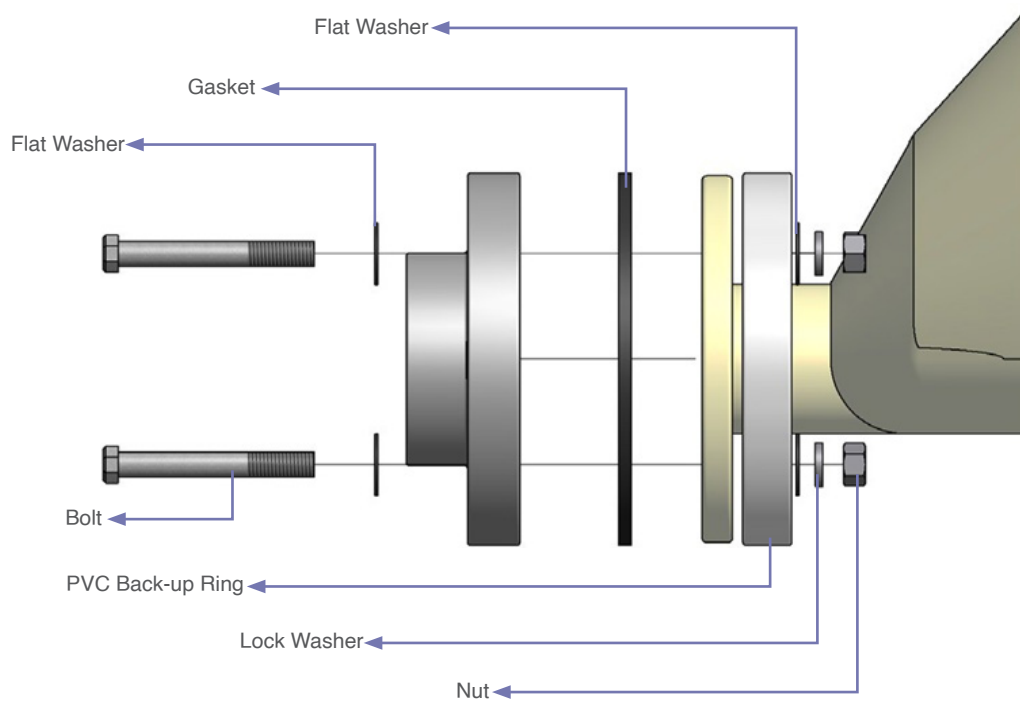
CORRECT STORAGE:
Notice clearance of tank above the floor

4" Minimum Clearance Between Tank Bottom and Floor

IMFO® FLANGE FITTING ASSEMBLY



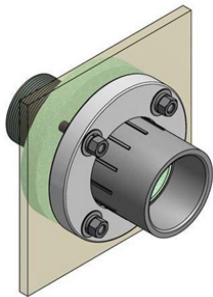
Tapered IMFO® w/ Stainless Steel Back-up Ring



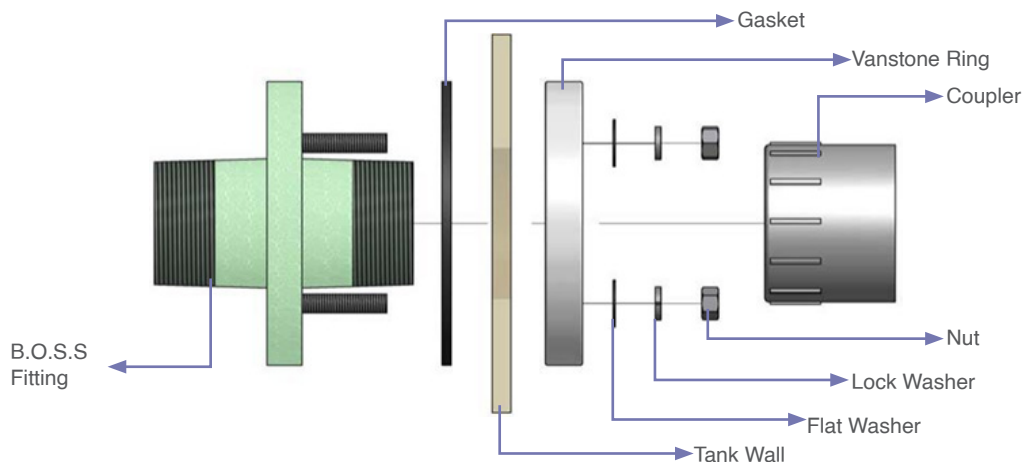
Original IMFO® w/ PVC Back-up Ring

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

- Using the gasket as a template, mark the bolt holes on the outside of the tank.
- Drill the center hole and stud holes with a 1/4-in pilot bit. Be precise with the layout and drilling of the tank as the fitting requires close tolerances.
- 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.
- Next drill out the stud bolt holes using a 5/8-in drill bit for the 1/2-in diameter studs.
- Clean and bevel all drilled and cut holes on the inside and outside of tank surfaces.
- Install the fitting and gasket from the inside of the tank. 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.
- Slide the flange onto the stud bolts that are protruding on the outside of the tank.
- Place 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 15-20 ft. lbs. on a torque wrench).
- Inspect the fitting. The gasket should be compressed and the flange should conform to the wall of the tank.
- Hydro test the tank for at least 24 hours prior to loading with chemical.
- These fittings will require a thicker Teflon tape and should be wrapped around threads several times



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



BULKHEAD FITTINGS

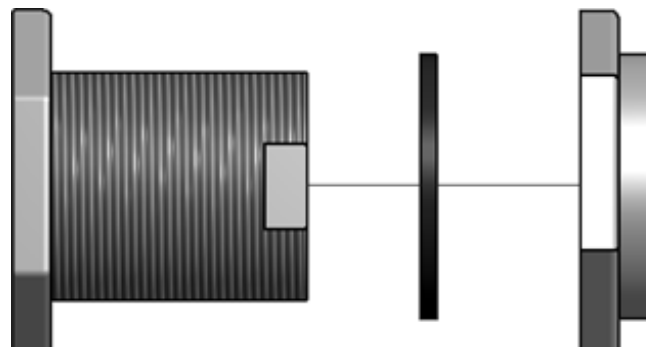
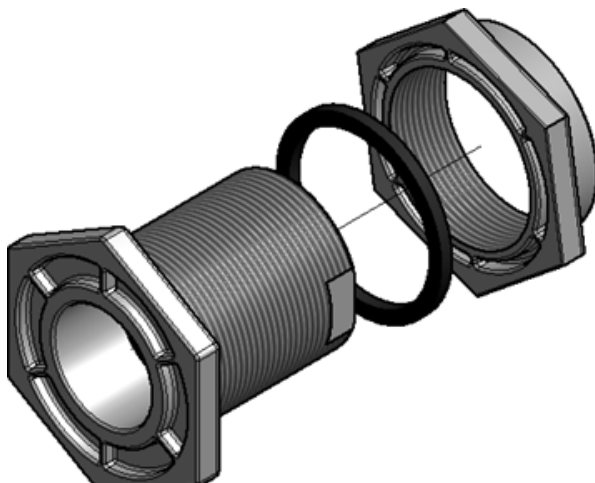
- Slide the gasket over the body of the fitting.
- From inside the tank, insert fitting body into hole in tank sidewall.
- Lubricate threads on fitting body with thread sealant and install large nut on the outside of the tank.
- Hand tighten plus 1/4 turn with a wrench. This may vary slightly. Most Bulkhead fittings use left hand threads.
- Do not allow fitting body to slip or spin when tightening to prevent the gasket from

creeping between the fitting and the tank wall.

- Inspect gasket for creep. If found, loosen nut and perform steps 4 & 5 again.
- When installing a pipe or flange adapter into the BHF, do not allow BHF to slip and do not overtighten.
- **Hydro test the tank for a minimum of 24 hours before placing into chemical service.**
- **Bulkhead fittings and tank sidewall restrictions:** Should not be used on the bottom sidewall of tanks greater than 3,000 gallons or tanks greater than 6' in height.



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

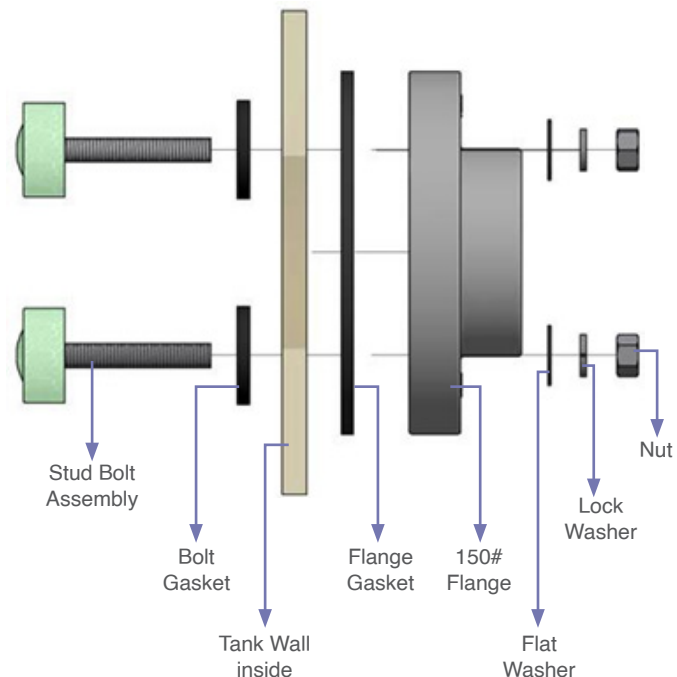
- Flanges for pipe sizes 4-in and larger should be curved to match the outside diameter of the tank.
- Disassemble the fittings as shipped. If the holes are not drilled, place the flange against the tank in the desired location and use as a template for drilling the holes. Use a hole saw the same size as the fitting's port.
- Clean and bevel all drilled and cut holes on the inside and outside of tank surfaces.
- 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.
- Place the full face flange gasket over the bolts on the outside surface of the tank.
- Place the flange over the gasket and stud

threads with the hub of the flange facing out.

- Put a washer and nut on each stud bolt. Be sure to lubricate the threads of the bolts with anti-seize compound.
- Tighten the nuts in a crisscross pattern using a torque wrench. Tighten in 5 ft. lb. increments to 20 ft. lb.
- Inspect fitting. Gasket must be compressed and the outer flange drawn down evenly.
- Piping such as a flange adapter should now be threaded into the fitting. Thread sealant or Teflon tape is recommended should be applied to all pipe threads. Do not over tighten.
- Hydro test the tank for a minimum of 24 hours before placing into chemical service.



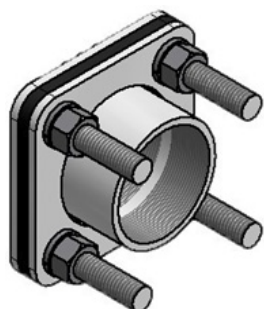
Bolted Flange size	Hole saw size
1"	1 5/8"
1 1/2"	2"
2"	2 1/2"
3"	3 5/8"
4"	4 1/2"
6"	6"
3"	4 1/2"
4"	5 3/4"



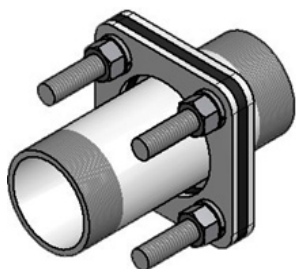
CAUTION: Over torquing will damage the flange and gaskets.

STAINLESS STEEL FITTINGS

- Disassemble the stainless steel fitting by removing the nuts from the stud bolts. Remove the 1/8-in thick stainless-steel outer plate. Set the remainder of the fitting aside along with the nuts and washers.
- Using the outer plate as a template, mark the bolt holes on the outside of the tank.
- Find the center of the large “pipe fitting” hole by drawing an “X” through the center of the bolt holes.
- 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.
- Next drill out the stud bolt holes using a 5/8-in drill bit for the 1/2-in diameter studs
- Clean and bevel all drilled and cut holes on the inside and outside of tank surfaces.
- Install the fitting and gasket from the inside of the tank.
- Slide the outer plate onto the stud bolts that are protruding on the outside of the tank.
- 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 25-ft. lbs. on a torque wrench).
- Inspect the fitting. The gasket should be compressed, and the outer stainless-steel plate should conform to the wall of the tank.
- Hydro test the tank for a minimum of 24 hours before placing into chemical service.**

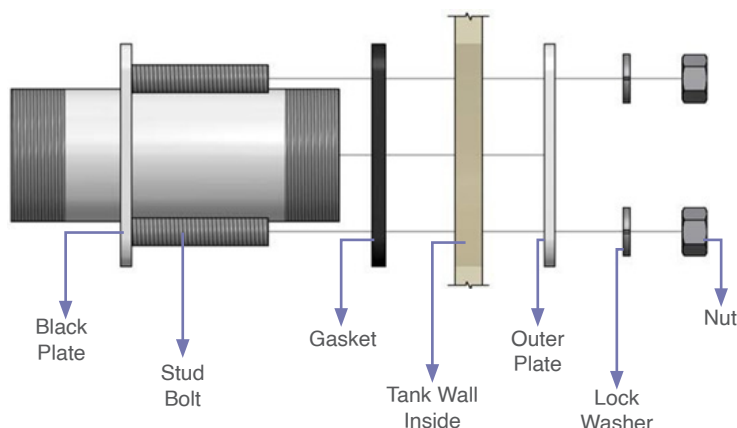


STAINLESS STEEL Coupler



STAINLESS STEEL Full Nipple

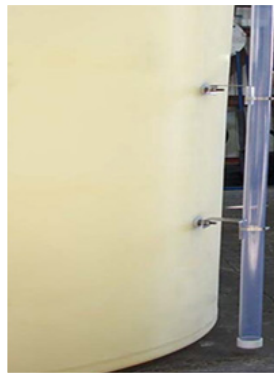
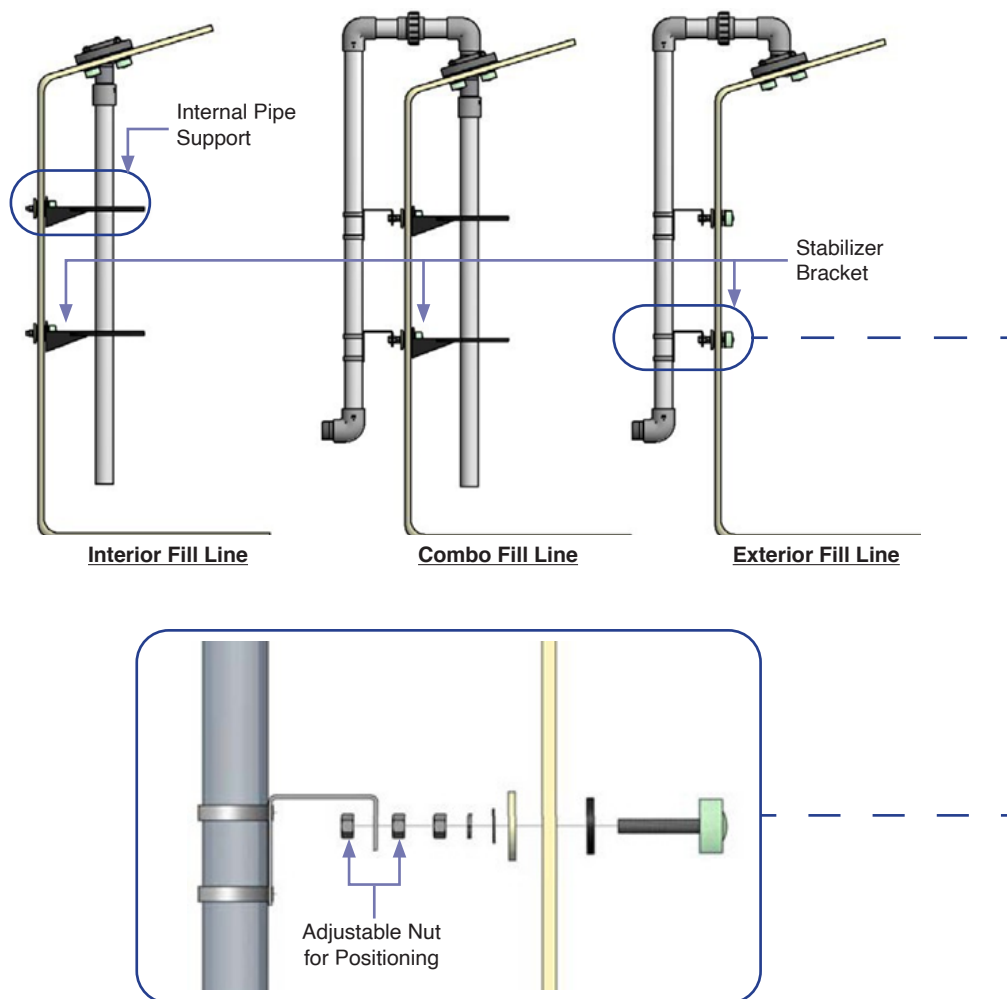
Rhino SS BHF size (Coupler Style)	Hole saw size	Rhino SS BHF size (Nipple Style)	Hole saw size
1/2"	1 3/8"	1/2"	1 3/8"
3/4"	1 5/8"	3/4"	1 5/8"
1"	1 7/8"	1"	1 7/8"
1 1/2"	2 1/4"	1 1/2"	2"
2"	2 5/8"	2"	2 1/2"
3"	4 1/2"	3"	3 5/8"
4"	5"	4"	4 3/4"



FILL LINE ASSEMBLIES

Fill line assemblies are available in 3 styles: internal, external and combination (see example drawings below, number of pipe supports may vary).

Your tank system may be equipped with a drop pipe stabilizer bracket which is typically shipped loose and requires simple installation. The internal pipe support is typically preinstalled at the manufacturing facility.



SELF ALIGNING UNIVERSAL BALL DOME FITTING

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.

- Do not stand on tank dome when installing dome fittings. Use portable ladders, scaffolding, or personnel lifts with proper fall protection.
- Install the bulkhead fitting or flange portion of the ball dome fitting according to instructions found on page 13 or page 14.
- Thread piping into the threaded ball of the fitting. Use thread sealant.
- Adjust vertical alignment:
 1. Gently loosen the ball retainer ring located on top of the fitting ball using a large blunt screwdriver or punch and hammer.
 2. Adjust piping to desired angle.
 3. Tighten retainer ring with blunt screwdriver or punch and hammer taking care not to over-tighten!



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 the tanks.



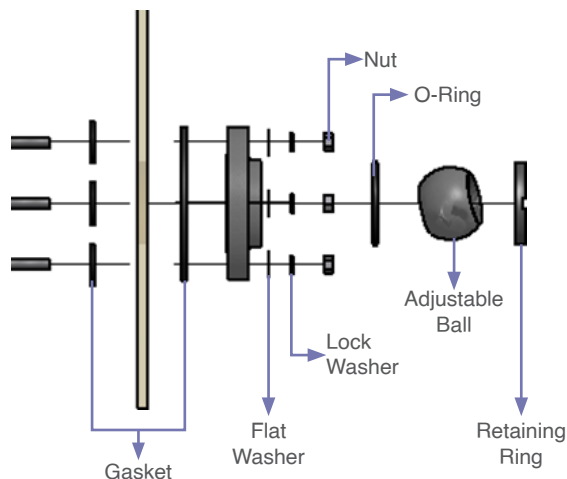
BHF Style

UBD size (BHF Style)	Hole saw size
1"	3 1/4"
2"	4 1/2"
3"	5 3/4"

UBD size (Flange Style)	Hole saw size
2"	3 1/2"
3"	4 1/2"
4"	5 3/4"



Flange Style

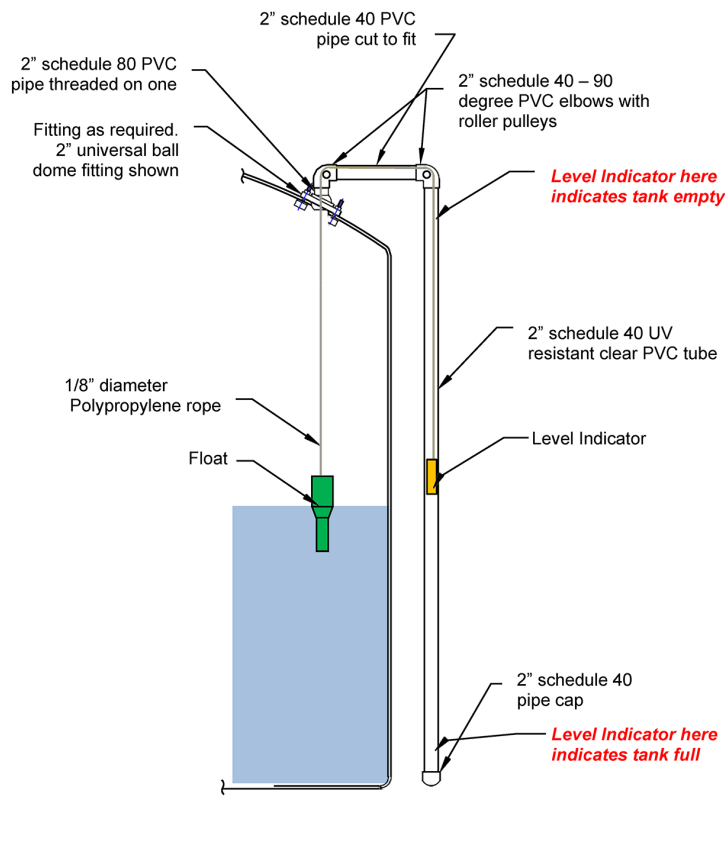


REVERSEFLOAT LIQUID LEVEL GAUGE

REVERSE FLOAT SYSTEM MAY NOT INCLUDE INTERNAL DOWNPIPE AND PIPE SUPPORT IF ORDERED WITHOUT IT. CHECK WITH YOUR SALES CONTACT TO SEE IF IT WAS INCLUDED IN THE ORDER.

DO NOT USE GLUE FOR ANY OF THE FOLLOWING STEPS!

- Retrieve exterior portion of gauge that is shipped loose.
- 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
- Attach rope to level indicator (note: length of rope must be determined during installation).
- Install threaded nipple into dome fitting.
- Attach first 90-degree elbow.
- Attach short pipe.
- Attach second 90- degree elbow.
- Place level indicator into clear pipe.
- Attach clear pipe to 90- degree elbow.
- Attach clear pipe to external pipe stabilizer.
- If using calibration tape, install from the bottom of the tank working towards the top.



Periodically lubricate rollers to ensure proper operation!
See www.polyprocessing.com/reversefloat for more information



FREE STANDING INTERNAL PIPE SUPPORT

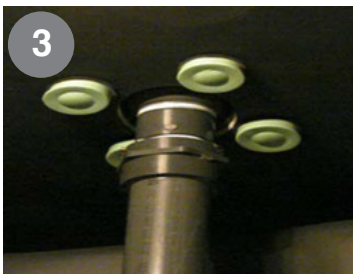
- Note: All piping associated with the use and installation of the pipe support will be packaged separately. Each length of pipe has been carefully measured at the factory and dry fitted to ensure ease of installation in the field.



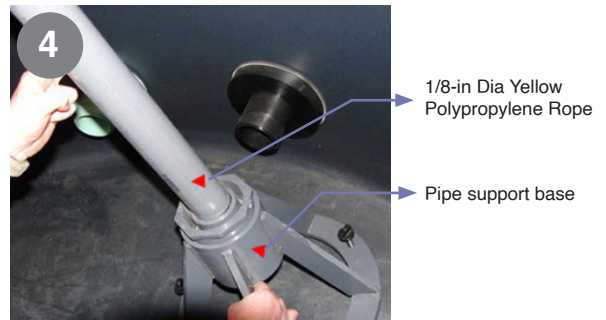
- The pipe support comes standard with a 4" slip by slip connection. 2" & 3" connections are obtained by using slip by slip reducer bushings which if ordered are glued in at the factory.



- From inside the tank, connect the pre-cut piping to the dome fitting. The dome fitting should be loosened so that it has about 1/4" to 1/2" of play in it. There are several types of dome fittings that can be used, Universal Ball Dome BHF, Universal Ball Dome Flange, Stainless Steel BHF, and PVC BHF.



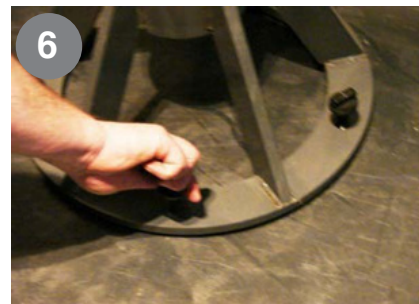
- Once the dome connection is made, pull the bottom section of the pre-cut piping to one side while angling the base until the slip by slip connection can be made. Note: All connections are "glued connections". As the piping is slipping into the base bring the entire system back to a vertical position aligned with the dome fitting.



- Photo showing the base installed to the piping and aligned vertically with the dome fitting.
- NOTE: At this point, re-tighten the dome fitting.



- After tightening the dome fitting, hand, tighten the plastic thumb screws (5) until they touch the bottom of the tank.



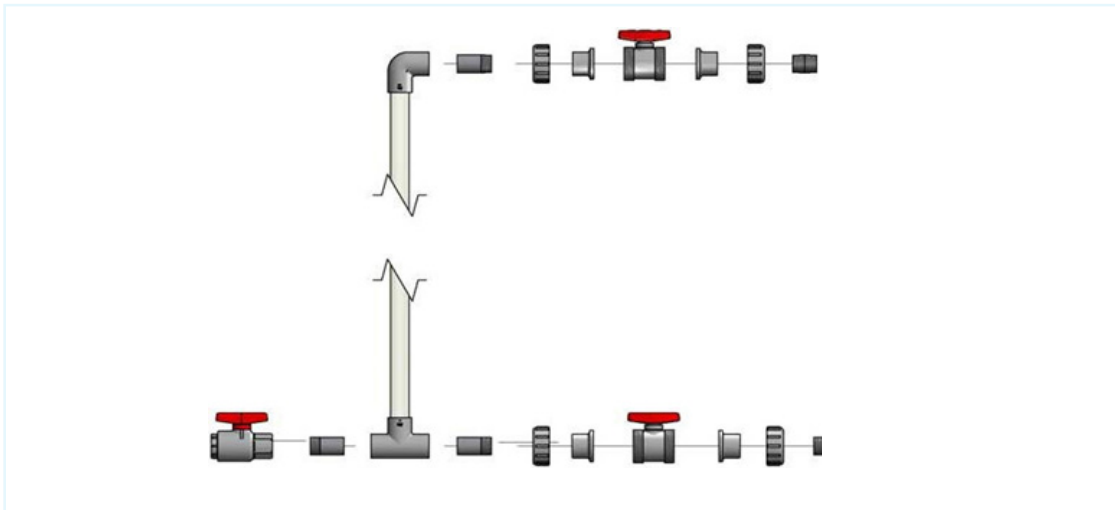
SIGHT GLASS LIQUID LEVEL GAUGE

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

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

Special Notes:

- The clear tubing will discolor over time due to chemical and UV attack.
- **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 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 the tanks.

INSTALLATION GUIDELINES ENHANCED BELLOWS TRANSITION FITTING

Before crane or boom truck leaves, make sure step 1-3 are completed and see videos at <https://www.polyprocessing.com/safetankinstall> for SAFE-Tank Installation Instructions

Tightening/torque criteria:

- Steel bolts/stud bolts --- tighten in crisscross pattern to 20 ft lbs. max.
- PVC BHF Nut --- Hand tight plus ¼ turn with a wrench

TESTING:

Following assembly, fill tank with water to the top knuckle, allow it to set for 24 hours, check to ensure no leaks



CRITICAL STEP:

ENSURE THE LINE ON THE ALIGNMENT SLEEVE LINES UP WITH THE OUTSIDE EDGE OF THE TANK. **THE ALIGNMENT SLEEVE MUST BE CENTERED AND THE GAP MUST BE EQUIDISTANT AROUND THE SLEEVE.** THIS MUST BE DONE WHILE CRANE OR BOOM TRUCK IS STILL AVAILABLE. THIS WILL ENSURE PROPER SPACING BETWEEN THE TWO TANKS.



INVENTORY:

- BELLOWS HOUSING
- SS SPLIT RINGS ((2) 6"/(1)8")
- PIPE/FLEX JOINT/BHF ASSEMBLY
- PLASTIC PE PLATE
- GASKETS ((1) 6"/(1)8")
- HARDWARE



AFTER ALIGNMENT IS CONFIRMED (**THE ALIGNMENT SLEEVE IS CENTERED**) REMOVE (2) NUTS AND REMOVE AND DISPOSE OF THE ALIGNMENT SLEEVE. WITH ALIGNMENT SLEEVE REMOVED MEASURE TO ENSURE INNER TANK FITTING IS CENTERED IN OUTER TANK HOLE.



WITH ALIGNMENT SLEEVE REMOVED, REMOVE NUT FROM BHF/PIPE ASSEMBLY AND SET ASIDE FOR LATER USE. **MAKE SURE ALL BOLTS OF THE PIPING ASSEMBLY ARE TORQUED CORRECTLY INCLUDING TANK FITTING, EXPANSION JOINT CONNECTIONS AND (COUPLER IF B.O.S.S. FITTING IS INSTALLED).** GLUE PIPE ASSEMBLY INTO THE INNER TANK FITTING.



INSTALL 8" GASKET ON OUTER TANK



INSTALL BELLOWS HOUSING AND 8" SPLIT RING USING THE PROVIDED HARDWARE. NOTE: AFTER ASSEMBLY IS GLUED REMOVE GASKET FROM BHF AND CHECK WITH A STRAIGHT EDGE. TO ENSURE ALL SEALING SURFACES ARE ON THE SAME PLANE.



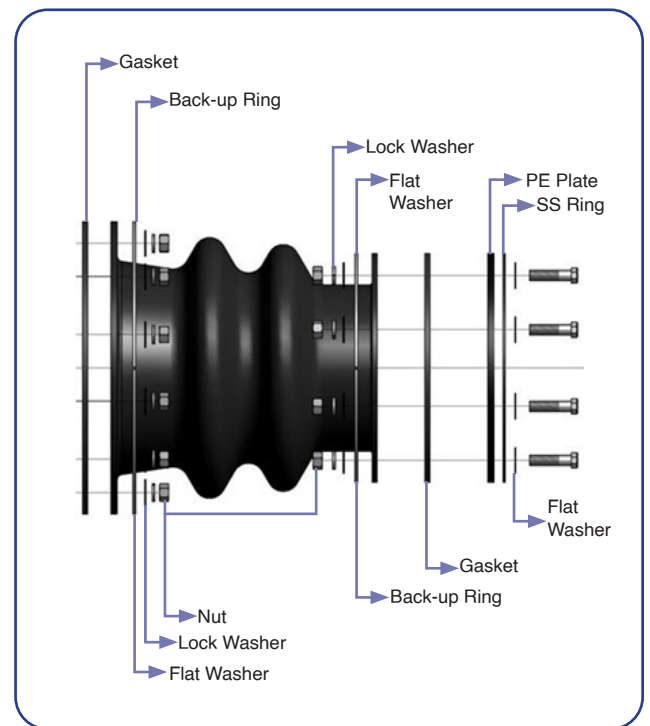
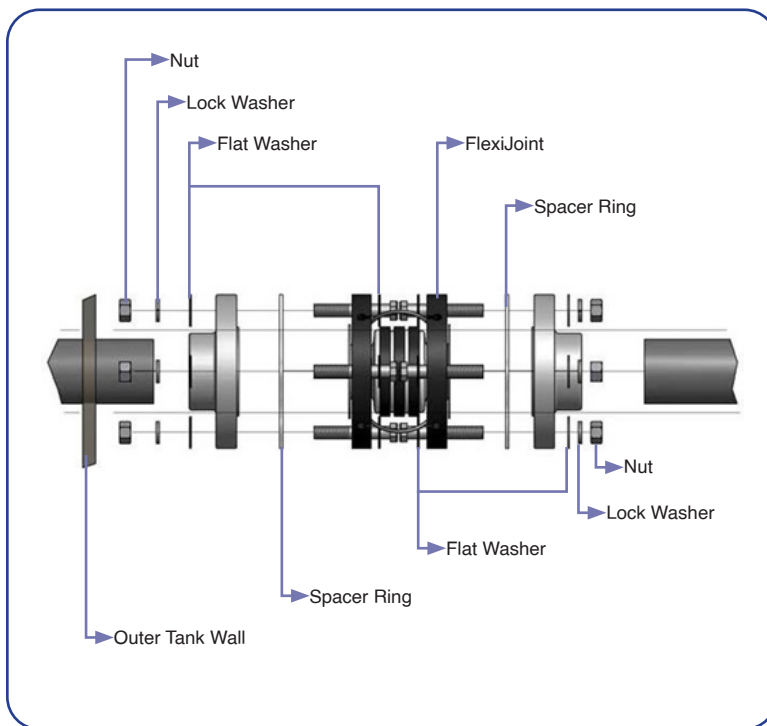
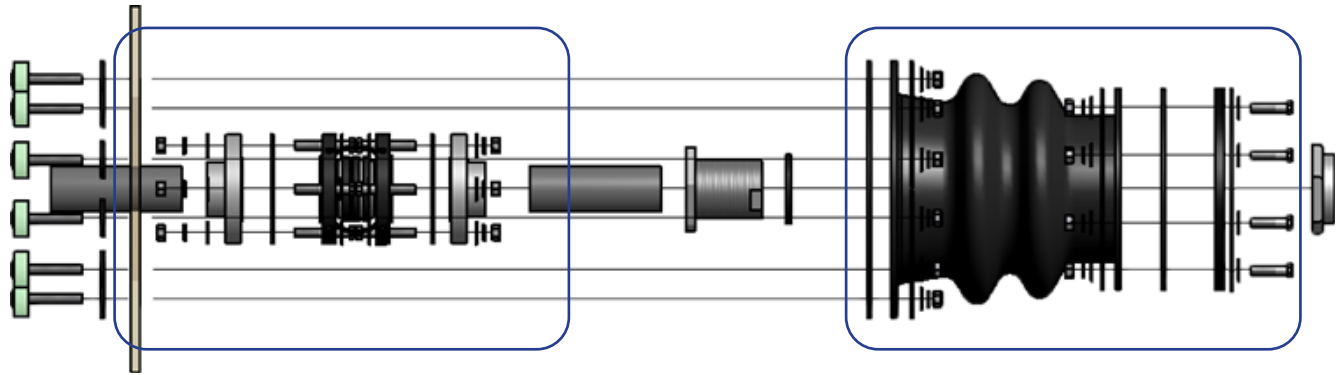
RE-INSTALL GASKET ON BHF THEN INSTALL; 6" GASKET, BLACK PE PLATE, AND 6" SPLIT RING's USING THE PROVIDED HARDWARE. TIGHTEN NUT ONTO BHF. CONNECT PLUMBING TO FEMALE THREADED BULKHEAD FITTING. HYDRO TEST TANK



SECTIONED VIEW OF ENTIRE ASSEMBLY

**QUESTIONS CALL:
1-866-765-9957**

BELLOWS TRANSITION FITTING EXPLODED VIEW



Attention: Tank Alignment Critical

Please refer to our installation guide or see the video at www.polyprocessing.com/safetankinstall for detailed instructions

FLEXIBLE CONNECTIONS

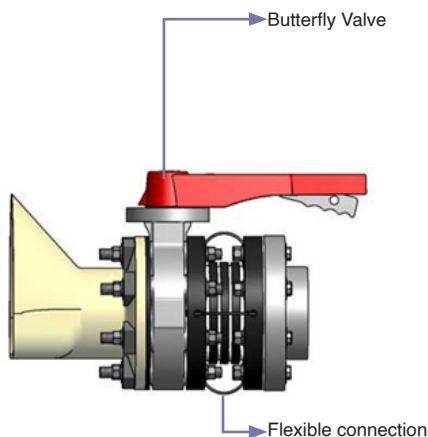
PPC requires that fittings and connecting pipes installed on the lower 1/3rd of the sidewall of a tank have flexible connections with the lowest spring rates possible to mitigate nozzle loading and to allow the tank to expand and contract and to protect the tank from pump vibrations.

The Ethylene Flex-Joint and the Proco 261R and 262R EPDM expansion joints have the lowest spring rates with the largest range of movements and are best suited for polyethylene and other plastic tank materials and piping systems. Poly Processing Company has experience with these expansion joints installed on our tanks in the field. When properly installed between the tank nozzle and the independently supported piping, the nozzle loads are reduced to the maximum spring rate of the flexible connection. Do not use expansion joints that are designed for steel piping on a plastic tank. Using the wrong expansion joint or system will void the warranty. Expansion joints should not be attached directly to the tank wall or IMFO. A full face flange must be installed on the tank first. Contact our factory with any questions.

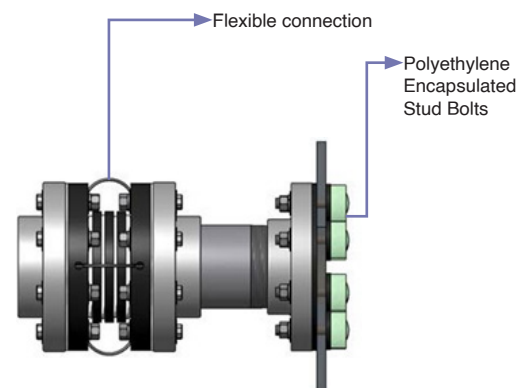
- Pipes connecting to dome fittings should also be independently supported eliminating nozzle load and do not require flexible connections

as there is little to no movement on the tank dome when the tank is filled and emptied.

- Install flexible connection in accordance with the specific manufacturer's installation guidelines:
 - The "breach opening" in the piping for the flexible connection should be within 1/8-in of the relaxed length of the flexible connection.
 - 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.
 - Attach only FULL FACE flanges to the flexible connection. They are not designed to attach directly to the tank wall.
 - Ensure adequate clearance between bolt ends for full use of flexible connections.
 - Torque to 20 ft. lbs. using crisscross tightening pattern.
 - Provide pipe support adjacent to the flexible connection



Flexible connection installed on IMFO® flange (Optional Flange Mate Shown)



Flexible connection installed near tank sidewall (Optional Flange Mate Shown)

- Flexible Connection Minimum Specifications:
(For common size fittings and piping systems up to 6") Contact Poly Processing for information on larger expansion joints.

- Axial Compression $\geq 0.67"$
- Axial Extension $\geq 0.67"$
- Lateral Deflection $\geq 0.51"$
- Angular Deflection $\geq 14^\circ$
- Torsional Rotation $\geq 4^\circ$



- Installation of flexible hose connections:
 - Minimum hose length for 1"-4" dia. is 36". PPC supplies 36" and 48" lengths.
 - Use 90° elbows at each end of the flexible hose.
 - Use of thread sealant or Teflon tape is recommended for pipe thread preparation.
 - Support hose adequately but do not restrict its ability to move in horizontal directions.

FLEXIBLE CONNECTIONS

Proper Installation of Pipe Supports

Pipe supports positioned **CORRECTLY**: pipe support must be placed after the flexible connection to allow the tank to properly expand and contract.



Pipe supports positioned **INCORRECTLY**: pipe support incorrectly placed before the flexible connection does not allow the tank to properly expand and contract, which can cause the piping or tank to crack over time.



FLEXIBLE CONNECTIONS

Proper Installation of Expansion Joints

Flexible connections aligned **CORRECTLY**: pipe system with the expansion joint is aligned in a straight manner, which allows for proper expansion and contraction of the two connecting tanks



Flexible connections aligned **INCORRECTLY**: the expansion joint should not be used to accommodate misaligned piping. This will limit the ability of the expansion joint to function correctly and possibly damage the joint itself.



Go to www.polyprocessing.com/flex for more information

CUSTOMER INSTALLATION GUIDELINES FOR FRP LADDERS

Pre-Installation

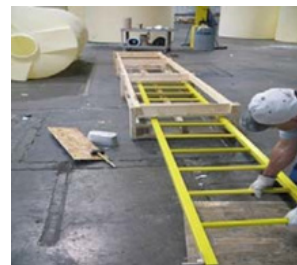
Tank will arrive with bracket attached



Ladders will arrive packaged



Unpacking the ladder components



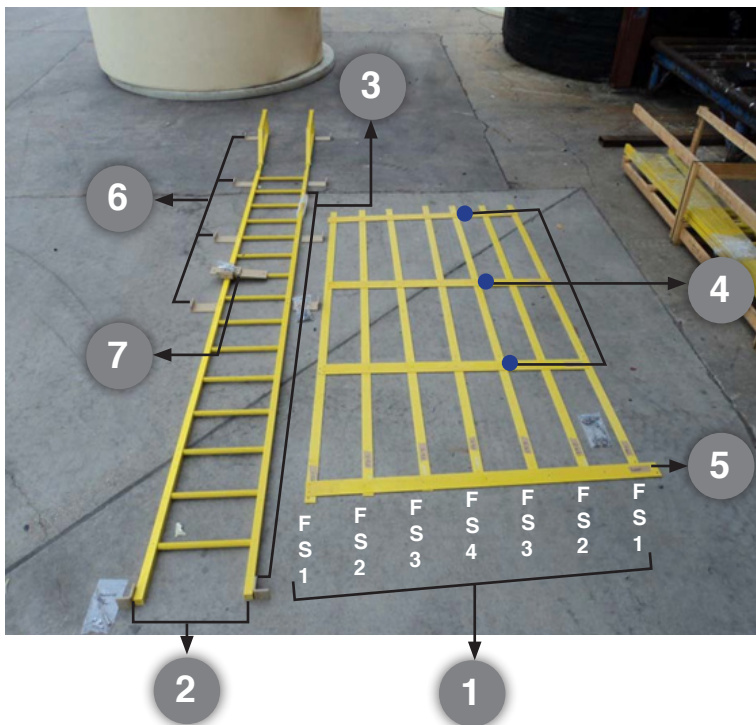
Unpacking the ladder components

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.



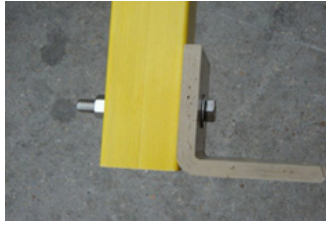
- 1 Vertical cage slats are numbered as shown in the photo and must be installed in this sequence. Both of the FS-1 slats will have additional bolt holes for attachment to the cage brackets
- 2 Feet and hardware
- 3 Main ladder span
- 4 Upper Cage Hoops
- 5 Lower Cage Hoop (the longest of the hoops)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



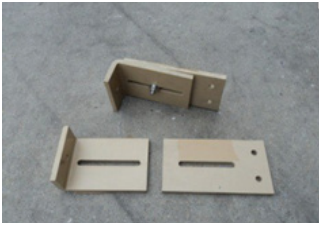
Ladder assembly and installation WARNINGS:

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 ladder legs



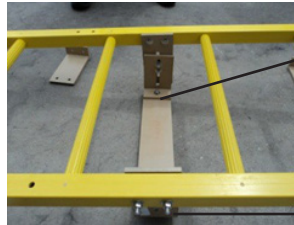
Step 3: Assemble and attach adjustable support bracket



Bolt the mounting bracket to the adjustment plate



Completed assembly

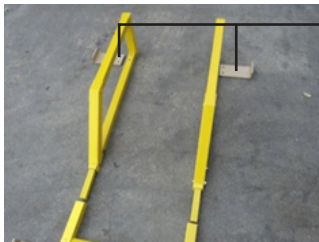


Support bracket bolted to ladder rails

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

Drill holes into ladder approximately at the midpoint of ladder. Install bolts with bolt head on the inside of ladder railing and nuts and washers on the outside.

Step 4: Install returns or walk through if applicable at top of ladder



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

Drill bolt holes for the ladder return. Bolt, washer, and nut at 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.

Step 6: Install cage attachment brackets



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



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

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.
5. There is no weight or load rating for the domes of tanks.
6. In addition:
 - Make certain the four bolts associated with the metal ladder attachment bracket are tight before using ladder.
 - Some field drilling of holes in the ladder is required. Do not drill extra holes or enlarge factory drilled holes.
 - When fully assembled, the ladder and accessories should have no unfilled bolt holes.
 - 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 forklift and align the top of the ladder railing with the the tank's metal ladder bracket. The ladder railings will need to be drilled onsite to match the holes in the 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 1/2" bolts. Torque to 5 ft. lbs.

Step 8: Make Adjustments

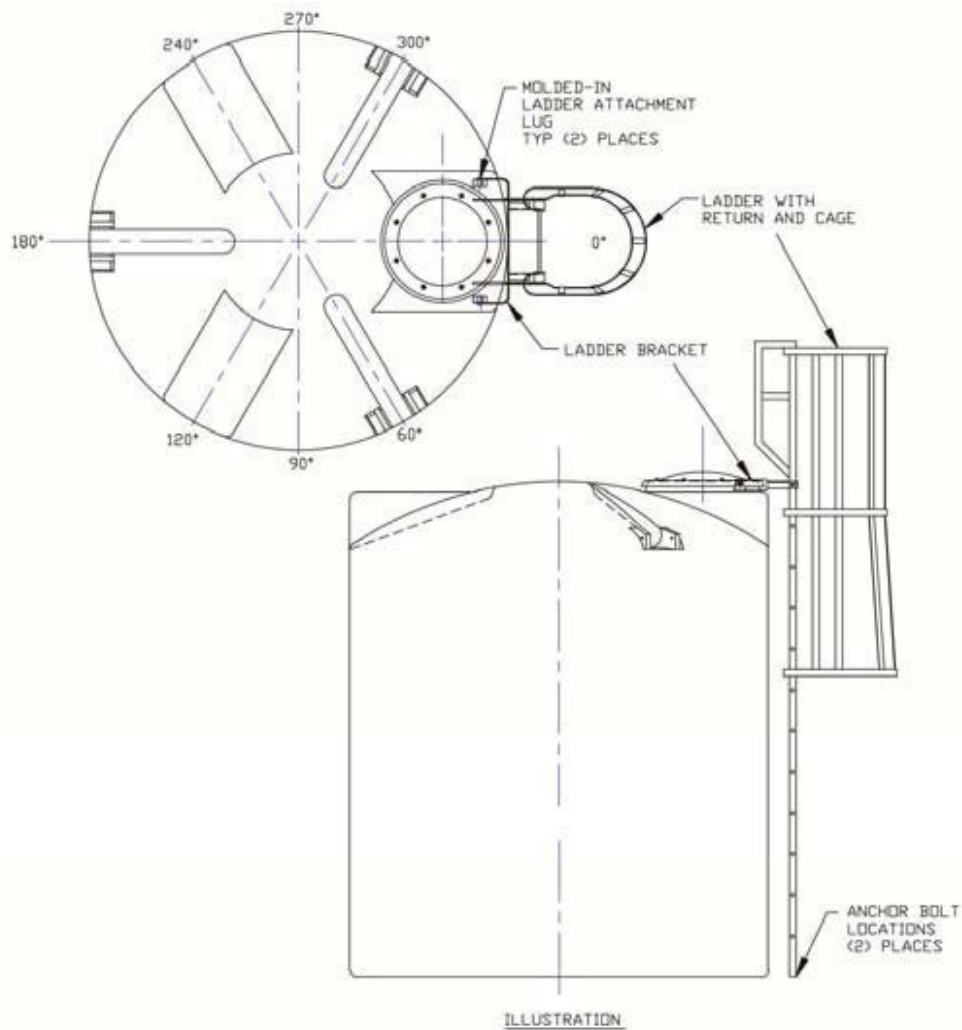


Plumb the ladder. Mark the location for the anchor bolts. Drill anchor holes and attach ladder to foundation.



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



RESTRAINT SYSTEMS

Wind and seismic restraint systems are governed by state and local code. Consult your local code for requirements. The drawings below show specific seismic systems. The material, type of clip, quantity of clips, cables, etc. may vary. Please consult the calculations that were sent with your system or contact Poly Processing with any questions.

1. Restraint Clips

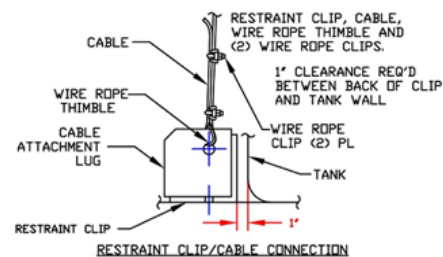
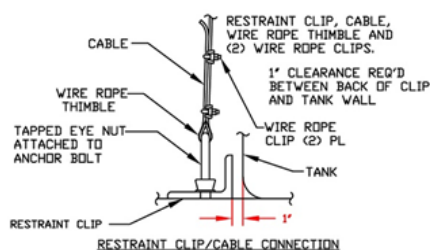
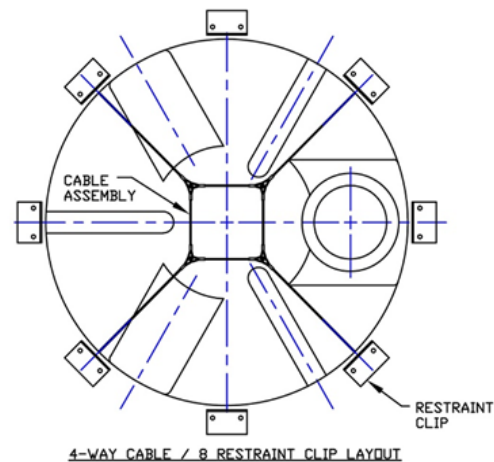
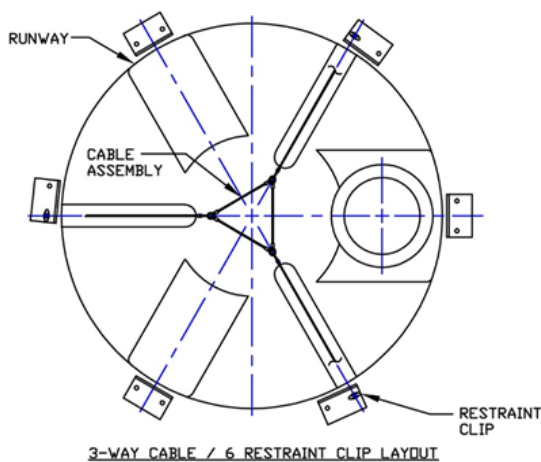
- Space equally around circumference of tank. If tank operating temperatures exceed 100° F, contact Customer Support for proper clip placement.
- Allow minimum of 1-in clearance between tank and back of clip to accommodate tank expansion.
- Attach the clips to the foundation with appropriate fasteners (customer supplied).

2. Cable Assembly

- Place cable assembly over the tank with the cable sling or tension ring at the top center of the dome.
- Pass each cable leg over the upper shell knuckle.
- 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.
- Install the wire rope clips by forming a loop with the cable end. See instructions included with wire rope clips.
- After the cable is attached to the restraint clips, the excess cable slack must be removed. Cable tension should only be hand tight. Excessive cable tension should be avoided as it may cause undue stress and deformation to the tank.
- After cable tension is properly adjusted, the wire rope clips should be checked for proper tightening.

3. Periodic Inspection

- Periodically check cables and wire rope clips to ensure proper but not excessive tension.
- Adjust if necessary, following the last 2 steps under 2. Cable Assembly above.



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



Position SS Tabs



Place Tank on Stand



Finished Assembly

START-UP CHECKLIST

- Make sure all fittings are tightened using the factory recommended torque values and techniques.
- Hydro test (water test) tank system for 24 hours before introduction of chemical. Remove all test water from tank to prevent reaction with chemical stored.
- Follow chemical manufacturer's best practices for product being stored.
- Confirm compatibility of tank, fittings, bolts and gaskets before filling tank with chemical.
- Obtain, utilize, and retain Material Safety Data Sheets (MSDS) for the chemical being stored.
- Make sure vent size is not reduced. Inspect vent lines for obstruction. Verify vent size is adequate to prevent over pressurization of the tank. Follow Poly Processing's venting guidelines. See page 4.
- Ensure flexible connections are installed on all lower sidewall fittings and that they are installed correctly. See page 26.
- Ensure there is adequate support of valves, piping and hoses and that support is installed correctly. See page 26-29
- Ensure valves are installed as close to the tank as possible. Be sure valves can be easily accessed.
- Check ladders at top and bottom for stability and safety.
- Label tank with the appropriate warning label for the chemical being stored. Do not remove Poly Processing's general warning labels.

SAFETY TIPS

- DO NOT STAND OR WALK ON TOP OF TANK. The tank surfaces are flexible and slippery and a dangerous fall can occur. There is no weight or load rating for the domes of tanks.
- Tanks are confined spaces. Follow proper entry procedures based on local, state, and federal regulations. Establish and adequate retrieval plan.
- Maintain guards, shields, barriers, and walkways to protect tank, fittings and piping from impact and to protect personnel from chemical release.



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.

MAINTENANCE ITEMS

- Conduct annual inspections of the tank. See page 36 for inspection guidelines.
- Inspect gaskets for signs of fatigue. Replace as necessary.
- Check bolt torque on fittings and adjust as needed. Make sure all fittings are tightened using the factory recommended torque values and techniques.
- Look for signs of stress cracking on both the exterior and interior surfaces of the tank. Look for crazing or a spider web type look.
- Check flexible connections to make sure they are functioning properly, are not in a bind, and are not worn or leaking.
- Check threaded couplers to make sure they cannot be turned by hand.
- Check for leaks at the threaded couplers. This can be caused by over tightening and can take months or years to finally give.
- Inspect valves for leaks and make sure they are working properly.
- Inspect vent lines for any restrictions or obstructions.
- Inspect ladders, brackets, stabilizers and stands for signs of corrosion.

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 4.
- 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.

LIMITED WARRANTY

Poly Processing Company Product	Warranty Period
CROSSLINKED POLYETHYLENE TANKS for all suitable applications except those listed below Max tank size for on-site generation of low concentration sodium hypochlorite (.8%) is 4000 gal unless larger size approved for specific application	5 Yrs
IMFO® TANKS STORING SODIUM HYPOCHLORITE 9 – 15 wt.% (refer to PPC Position Statement) HDXLPE w/ OR-1000™, 1.9 spg. rating	5 yrs.
NON-IMFO® TANKS STORING SODIUM HYPOCHLORITE 9 – 15 wt.% (refer to PPC Position Statement for System Requirements) 1000 gallons and larger: HDXLPE w/ OR-1000™, 1.9 spg. rating Less than 1000 gallons: HDXLPE 1.9 spg. rating	3 yrs.
TANKS STORING SULFURIC ACID ≤ 98% CONCENTRATION (refer to PPC Position Statement for System Requirements) Sulfuric Acid may be stored in tanks less than 11,000 gallons and less than 15' tall. This includes vertical, IMFO®, Sloped IMFO®, and SAFE-Tank®	3 yrs.
TANKS STORING HYDROCHLORIC ACID ≤ 37% CONCENTRATION (refer to PPC Position Statement) HDXLPE w/ OR-1000™, 1.9 spg. rating	5 yrs.
TANKS STORING HYDROCHLORIC ACID ≤ 37% CONCENTRATION (refer to PPC Position Statement) HDXLPE 1.9 spg. rating	3 yrs.
LINEAR POLYETHYLENE TANKS - for all suitable applications except Sodium Hypochlorite 9 – 15%; Sulfuric Acid and Hydrochloric Acid of any concentration	3 yrs.

Chemical manufacturing service, rental service, mobile service, and elevated temperature service are special applications. Contact Poly Processing Customer Service for warranty for these applications.

Poly Processing Company's warranty consists of repair or ONE-TIME 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 and/or user's responsibility. Warranty begins at date of shipment from PPC plant.

Standard Poly Processing parts and ancillary items are warranted for ninety (90) days. Electrical heat tracing systems are warranted ONE YEAR. Non- standard parts warranty is by manufacturer.

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; c) guidelines set forth in the PPC Installation Manual and/or in PPC Position Statements.
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.

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.

Below are links to additional IOM information which you may find helpful:

[SAFE-Tank and Enhanced Bellows Fitting Installation](#)

[PPC Heat Maintenance System User Manual](#)

[Repairing a Scratch in a Polyethylene Tank](#)

[Repairing a Gouge in a Foamed Tank](#)

[Installing a PVC Bolted Flange Fitting](#)

[Poly Processing's Video Collection](#)



Company Headquarters

P.O. Box 4150 (71211)
2201 Old Sterlington Road
Monroe, Louisiana 71203
Tel: 866-765-9957

8055 S. Ash St.
French Camp, CA 95231

161 McGhee Road
Winchester, VA 22603