



Proper Tank & Piping Installation

4/22/2020

CHEMICAL AND INDUSTRIAL TANKS
WE PROVIDE DESIGN, ENGINEERING, AND ON-SITE CONSULTATION FOR THESE PRODUCTS

POLYETHYLENE & FIBERGLASS (FRP) TANKS

- From 5 gallons up to 75,000 gallons
- Single Wall, Double Wall, Double Containment
- Dome Top, Open Top, Conical Bottom, Dish Bottom, Flat Bottom
- Full NSF 61 approval for Chemical Storage and Portable Water
- 5-year warranty, FDA approved, ISO 9001, FRPI approved

STEEL & HIGH ALLOY TANKS

- Up to 250,000 Gallon
- Atmospheric and ASME Certified Pressure Vessels
- NSF and FDA Approved
- Can build to UL, API 650, NSF-61, ABS, ASME standards

FABRICATED POLYETHYLENE AND POLYPROPYLENE TANKS CABINETS & FUME HOODS
TANK, PIPE, VALVE HEATING. SPECIALTY PUMPS, INSTRUMENTATION & CONTROLS

TANK, PIPE & VALVE HEATING

FULL PRODUCT RANGE FOR ANY HEATING APPLICATION:

- Immersion and Circulation Heaters
- Heat Trace Products
- Hot Water/Oil Steam Boilers
- Insulated & Heated Tank Blankets
- Class 1, Div 2 Heaters
- Corrosion Resistant Heaters
- Tank Heaters
- Heated Valve Covers
- MI Cable
- Heat Transfer Systems
- Premium Warranty
- Controls and Sensors



CHROMALOX
Advanced Thermal Technologies

INDUSTRIAL MIXERS



Custom engineered mixers for any size application. Mixer retro-fits and upgrades.



Mag Drive, Seal-Less pumps for industrial chemical, refrigeration, and liquefied gases.



Industrial sensors and controls for flow, level, pressure, temperature, and magnetic flow meters.

OIL/WATER SEPARATORS



Custom steel and stainless steel tanks. Above ground and below ground oil water separators. Plate clarifiers.

METERING PUMPS



Dosing and metering pumps. Water treatment controllers. Industry-best 5-year warranty. ISO 9001 & ISO 14001.

INSTRUMENT FITTINGS & VALVES



CBC Lok, CS Lok compression fittings & fully interchangeable with Swagelok®, Parker®, Quick disconnects, Ball/Plug/Needle Valves.



LANDFILL PRODUCTS & EQUIPMENT

POLLUTION CONTROL SYSTEMS AND EQUIPMENT

LANDFILL PRODUCTS

- SurePump® Wheeled Sump Drainers
- UL Listed Control Panels
- Flow and Level Monitoring & Control
- In Line Booster and Submersible Pumps
- Solar Pumps
- Leachate Collection and Recirculation



LANDFILL GAS SOLUTIONS

- LTL BioGas Flares
- Solar Spark Vent Flares
- Passive Vent Flares
- Pneumatic Pumps



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Certified Tank INSPECTION services available.

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Eastern Reliability - A Liberty Group Company

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Rev. 03/04/20

Agenda

- Definition of chemicals for purposes of storage; NFPA regulations.
- What fluids can and cannot be stored in polyethylene and FRP tanks?
- What criteria are used for determining whether to use a polyethylene, FRP, steel, or high alloy tank?
- Information needed for proper chemical or industrial tank application.
- Safe lifting techniques and tank features that make this more effective.
- Proper piping requirements.
- Application photos showing good and bad piping techniques.
- Discussion of secondary containment.
- Discussion of proper tank venting.
- Tips for longer tank service life.

Proper Tank Application and Installation

- Proper use and application of linear, crosslinked polyethylene, FRP tanks, and steel and high alloy.
- Oversize vent; vents should be 1.5 times larger than largest fitting, 2 times larger for bulk chemical tanker filling applications.
- Definition of chemicals for purposes of storage; NFPA regulations.
- What fluids can and cannot be stored in polyethylene and FRP tanks?
- What criteria are used for determining whether to use a polyethylene, FRP, steel, or high alloy tank?
- What are the specific criteria included in the laws of each state?
- Eastern Reliability website is your resource (www.easternreliability.com).

The background image shows two large, white, cylindrical industrial tanks, likely for water filtration or storage, situated outdoors. They are connected by a network of blue pipes and have yellow ladders attached to their sides. In the foreground, there is a grey metal walkway with railings. A semi-transparent dark grey rectangular box is centered over the image, containing the text 'Technical Considerations'.

Technical Considerations

Technical Considerations

- Definition of Chemicals for purposes of Storage
 - Flashpoint cut off is 200 F. NFPA Regulations
- What fluids can and cannot be stored in Polyethylene and FRP tanks?
 - Flashpoint above 200F - YES. Below 200F - NO
- What criteria are used for determining whether to use a polyethylene, FRP, steel or high alloy tank?
 - Temperature, NFPA Regulations
 - If the fluids name ends in ...ene, ...ine, ...one, ...ol
 - Examples are gasoline, toluene, methanol, acetone
 - No Polyethylene or FRP unless under NFPA Volumes or Underground (UST)

Model	Tank Diameter	Tank Height	Min. Wall Thickness 2.2	Min. Wall Thickness 1.9	Min. Wall Thickness 1.5	Min. Wall Thickness 1.35	Gallons Per Inch	Straight Side Capacity	Tip-Up Height
ICT 40	20"	38"	0.18	0.18	0.18	0.18	1.31	43	N/A
ICT 60	23"	43"	0.18	0.18	0.18	0.18	1.75	65	N/A
ICT 65	23"	43"	0.18	0.18	0.18	0.18	1.75	65	N/A
ICT 80	24"	49"	0.18	0.18	0.18	0.18	1.9	84	N/A
ICT 140	29"	58"	0.18	0.18	0.18	0.18	2.79	148	N/A
ICT 175	35"	51"	0.18	0.18	0.18	0.18	4.07	179	N/A
ICT 200-35	35"	57"	0.18	0.18	0.18	0.18	4.07	203	N/A
ICT 200-36	36"	53"	0.18	0.18	0.18	0.18	4.32	200	N/A
ICT 250	35"	69"	0.18	0.18	0.18	0.18	4.07	252	N/A
ICT 400	48"	63"	0.18	0.18	0.18	0.18	7.77	411	N/A
ICT 300	35"	82"	0.18	0.18	0.18	0.18	4.07	305	90"
ACT 550	69"	40"	0.18	0.18	0.18	0.18	16.01	432	80"
ICT 550	69"	82"	0.18	0.18	0.18	0.18	7.77	555	96"
IFT 550	48"	79"	0.22	0.22	0.18	0.18	7.77	555	96"
ICT 700	69"	58"	0.18	0.18	0.18	0.18	16.01	689	100"
ICT 850	48"	120"	0.32	0.28	0.22	0.2	7.67	836	130"
IFT 950	64"	81"	0.27	0.24	0.19	0.18	13.74	1003	105"
ICT 1000	64"	84"	0.27	0.24	0.19	0.18	13.74	1003	105"
ICT 1100	86"	59"	0.18	0.18	0.18	0.18	24.92	932	113"
ICT 1200	64"	100"	0.34	0.29	0.23	0.21	13.69	1208	116"

Information Needed for Proper Chemical or Industrial Tank Application

Information Needed

- Fluid being stored
- Concentration
- Temperature
- Connection sizes
- Is this a bulk chemical tank that will receive deliveries from a tanker truck?
- Footprint
- Height and diameter available to safely work around tank.
- Tip up height – rule is to add 10% to tank height
- Indoor or outdoor application
- Access to site or building



Applications

Applications

- Water & Wastewater Treatment
- Pulp & Paper Mills
- Liquid De-icers
- Inks & Dyes
- RO & DI Water Storage
- Laundry Facilities
- Pharmaceutical & Biotech
- Food and Beverage
- Chemical Processing
- Sanitation Products
- Oil & Gas Fields
- Chemical Manufacturers
- Blenders & Formulators
- Agra Industrial
- Poultry, Beef & Pork Processing
- Metals Finishing
- Power Generation
- Commercial

Applications (Continued)

- New York
 - Sodium Hydroxide
 - Corrugated Cardboard Facility
 - 2003 (top picture)
 - 2009 (bottom picture)
 - 2016 - still in service



Applications (Continued)



Applications (Continued)

- Indiana
 - Ink & dye storage
 - Short, wide diameter tanks for low overhead requirement
 - 550-gallon capacity
 - Many tank options for restricted height applications



Applications (Continued)

- Missouri
 - Sodium Hypochlorite
 - Double wall 250 gallon



Applications (Continued)

- North Carolina Power Plant
 - Magnesium Hydroxide
 - 12,000 gallons
 - For stack scrubbing



Applications (Continued)

- Oklahoma
 - Sulfuric Acid
 - Double wall
 - 3,050-gallon capacity



Applications (Continued)

■ Maine

- Calcium chloride, brine solutions
- Over 90 tanks provided to over 20 Maine locations since 2003
- All tanks 5,500-gallon capacity
- No failures in super harsh environment with 110-degree annual temperature swings





Installations Procedures, Pitfalls & Recommendations

Safe Lifting



Safe Lifting with crane
& Proper Rigging

Safe Lifting

- Many lifting options available
- Single or dual center lifting lugs
- Coated steel, 304 SS, polyethylene
- 4-point lifting lugs installed in 90-degree locations
- Should be included with every tank 2000 gallons and larger
- Method for smaller tanks: 4"x4"x3' block placed in manway and lifted with strap



Installations: Procedures & Proper Piping

- Safe lifting & handling. Use a rigger/crane company.
- Adequate secondary containment – at least 110%.
- Routine cleaning – recommended annually for *every* tank. Allows for routine visual inspection and “peace of mind.”
- Proper venting – at least 1.5 times the largest fitting; 2 times when tank is filled by bulk tanker conveying fluids by air pad (or blanket).
- Expansion joints for all side wall connections.

Installations: Procedures & Proper Piping

- Install tank on tank stand, a sheet of polyethylene or 5-6 layers of 15-pound roofing felt.
- Proper expansion joint installation as close to the tank as possible.
 - Required for polyethylene tank warranty and for FRPI certification.
- Proper piping support. Always after the XPJ and valve.
- Proper isolation valve installation. Don't expect the weight of the valve to be supported by the tank.

Good Installation



Good Example, Bulk tanks
in containment basin

Secondary Containment

- Required for all chemicals classified by the EPA as hazardous.
- Many states are more stringent, also including all wastewater.
- 110% of largest volume tank in secondary containment basin.
- Always separate reactionary chemicals.
- Acids and caustics should not be in the same secondary containment area.

Secondary Containment

■ Quiz Question:

– *If a secondary containment basin has (6) 6,500-gallon tanks and (1) 8,000-gallon chemical tanks, how much secondary containment is required?*

- Possible answers:

- a) 7,600 gallons
- b) 8,800 gallons
- c) 51,700 gallons
- d) 36,000 gallons



Good Installation



Answer

b) 8,800 gallons

- Allows for a low very secondary containment berm.
- No need for stairs, ladder, or platform to access the secondary containment basin.



Bad Installation: No XPJ or Pipe Supports



Bad Installation: No XPJ or Pipe Supports



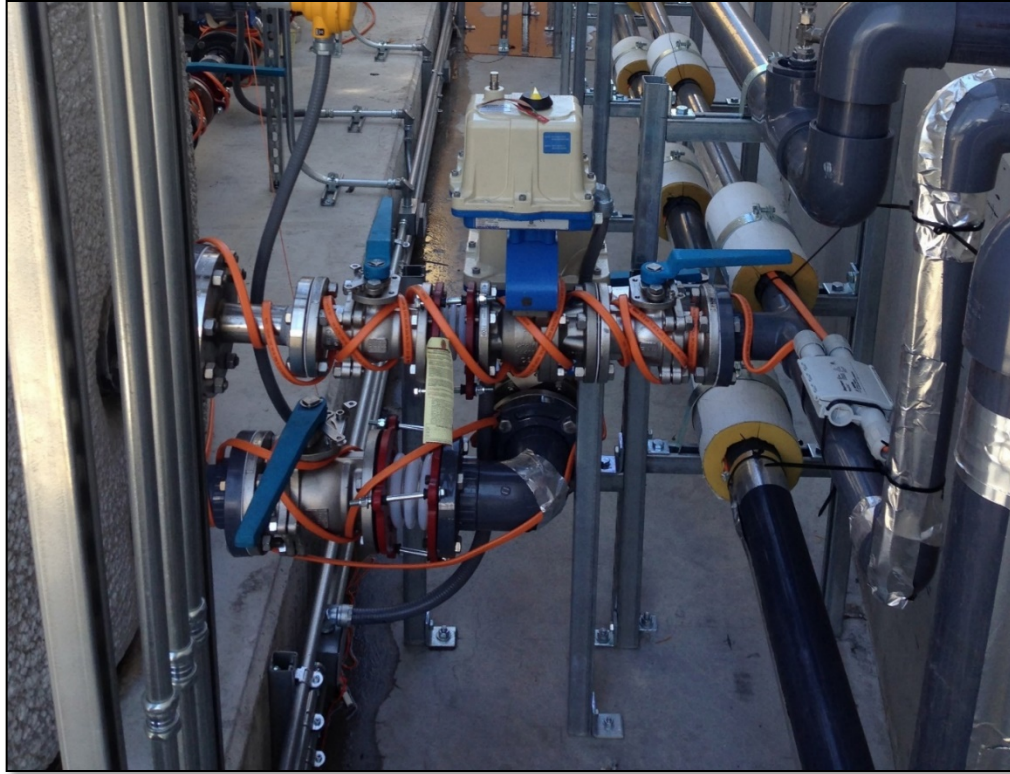
Good Installation: Proper Upper Expansion Joint



Good Installation: Proper Lower Expansion Joint



Bad Installation: Can you explain why?



Bad Installation



Bad example:
Rigid piping, no
flexible joints

Bad Installation



Good Installation: New London, CT WTP



Good Installation: New London, CT WTP



Bad Installation: Poor alignment and no channel for FDO spool piece



Proper Venting



The image shows three large, yellow, cylindrical hazardous waste drums standing in a row. Each drum has a black cap and a white label with text and a red 'HAZARDOUS WASTE' warning. They are placed on white, multi-compartment plastic bases. The background is a white wall with various safety signs, including a yellow 'MATERIAL SAFETY DATA SHEET' sign. A blue vertical pipe is visible on the left, and a wooden workbench is on the right.

Tips for Longer Service Life

Tips for Longer Service Life

- Oversize vent. Vents should be 1.5 times larger than largest fitting, 2 times larger for bulk chemical tanker filling applications.
- Protect tank from direct sunlight to prevent the UV from accelerating the chemical.
- Drain and flush tank with water annually.
- Do not use internal drop tubes on fill assemblies when air is used to transfer or fill the vessel.
- Fittings must be placed away from tank knuckle radius. Minimize side wall fittings.
- Tank fitting attachments shall be equipped with flexible couplers, minimize side wall connections. (XPJs) or other provisions that allow the vessel to expand.
- Avoid cross-section exposure.

Clean Your Tanks!



Summary

- It is very important that we have as much information about the application as possible.
- Understanding all the state and local regulations related to hazardous chemical storage and secondary containment is critical.
- Only utilize companies that provide long-term warranties, have industry recognized third-party certifications such as ISO, ASTM, FRPI, ASME, UL, CE, FM, ATEX, NSF, CSA.
- Install the tank per manufacturer's recommendations.
- Utilize the expertise that only the combination of good local representation and factory support can provide.
- There are many tank options and supporting equipment to help you provide a comprehensive solution in a cost-effective manner. Eastern Reliability's focus is on the **SOLUTION**.

Supporting Products

Industrial Mixers



Custom engineered mixers for any size application with 3-year factory warranty

Pumps



Mag Drive, Seal-Less Pumps for Industrial Chemical, Refrigeration, & Liquified Gasses.

Sensors & Controls



Industrial measurement sensors and controls for flow, level, pressure and temperature.

Oil/Water Separators



Custom steel and stainless-steel tanks. Above ground and below ground oil water separators. Plate Clarifiers.

Metering Pumps



Dosing and metering pumps. Water treatment controllers. 5 Year Warranty

Tank, Pipe & Valve Heating

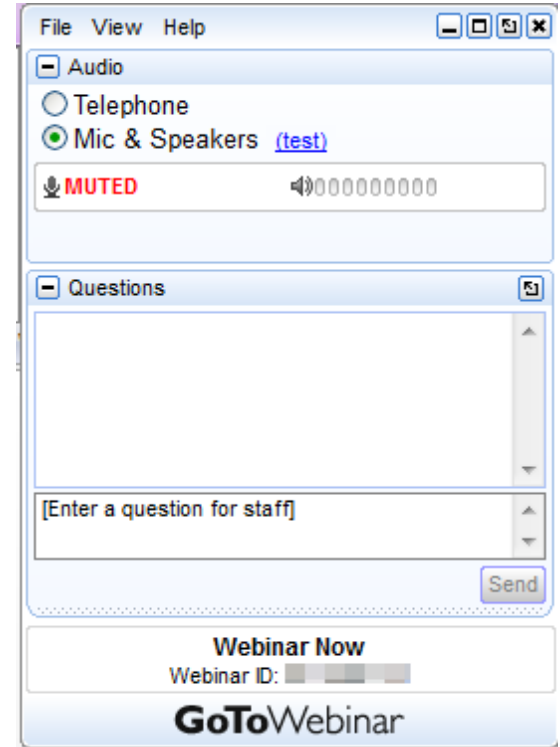


Tank Heaters, Heat Trace Products, Corrosion Resistant Heaters, Heat Transfer Systems, Controls and Sensors

Q&A

■ Questions?

- Enter any questions you may have in the Control Panel
- If we don't have time to get to it, we will reply via email



Thank You

Check out our website at www.easternreliability.com.
For more information email sales@easternreliability.com.