

Assmann Corporation of America

TANK INSTALLATION AND USE GUIDELINES FOR BULK STORAGE TANKS

General Information

Assmann polyethylene storage tanks are manufactured to give you the toughest; most reliable and economical vessels offered for storing industrial strength chemicals such as sulfuric acid, sodium hydroxide, sodium hypochlorite and many other corrosives. Our unique process utilizing uniform walls and air-cooling gives us an advantage over any other polyethylene tank manufactured today. However, these vessels are not immune to damage. Precautions must be taken while off loading, handling, installing, and using to protect your investment.

These handling and installation instructions are only recommendations and do not relieve the purchaser of the responsibility to inspect the tank upon delivery and to properly handle and install the vessel. Any damage that is the result of improper handling or installation will be the sole responsibility of the purchaser. Failure to comply with handling and installation instructions will void all warranties, expressed or implied. Misuse or undocumented applications are the burden of the purchaser.

Preparing The Tank Site

Complete bottom support of all polyethylene tanks must always be maintained. Tanks cannot be placed on grating or open floor designed where the tank base is not fully supported. It is critical that the tank foundation be clean of all foreign debris. Make sure that your pad is swept clean and 6 layers of roofing felt are placed between the tank base and the foundation.

Assmann Corporation recommends that all tanks be placed on a concrete foundation capable of supporting the weight of the tank with accessories and its intended service (chemical). Vertical tanks over 6,500-gallon capacity require a reinforced concrete foundation. Tanks from 6,500 gallons and below that cannot be placed on a concrete foundation must be placed on an area that is compacted, level, smooth, and free of any foreign objects that may damage the vessel.

Assmann Corporation also recommends that at least six (6) layers of 15 Lb. roofing felt be placed between the tank and its intended foundation. This will allow the tank to move without restriction.

Assmann Corporation is not responsible for damage due to improper tank base preparation.

Receiving Your Polyethylene Tanks

At the time of delivery, the purchaser shall be responsible for inspecting the tank and accessories for shipping damage before off loading. If damage has occurred, contact Assmann prior to unloading. All freight damage must be noted on the driver's shipping papers/bill of lading prior to signing for acceptance regardless of whether it is Assmann Corporation's truck or a contract carrier. Look inside the tank for fittings or accessories that may have been shipped loose before offloading.

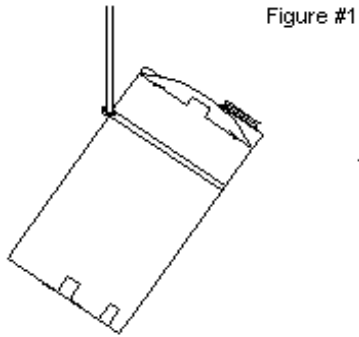
Failure to document damage or incompleteness of the vessel becomes the responsibility of the purchaser.

Contact Assmann Corporation for information on which party is responsible for filing the claim for damaged equipment. Once offloading occurs it becomes the responsibility of the purchaser to file a freight claim in the event of concealed damage.

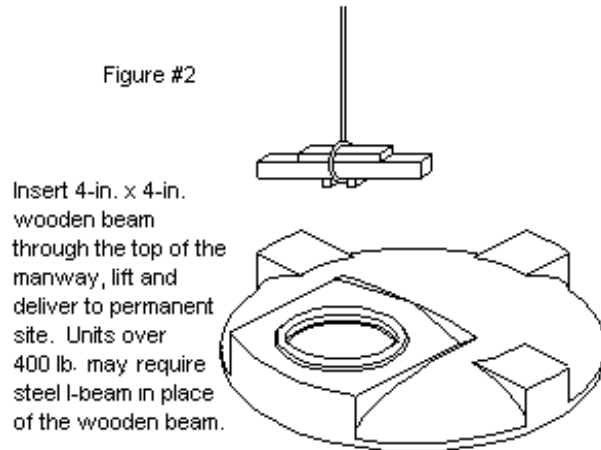
Off Loading Polyethylene Tanks

Assmann rotationally molded tanks are by far the toughest polyethylene tanks offered to the industrial market. However, the fittings and tanks are susceptible to damage if improperly handled. **DO NOT ALLOW THE TANK TO ROLL OVER INSTALLED FITTINGS.**

Whenever possible, use a crane or other suitable lifting devices to remove the tanks from the truck. Because the stability of the tanks can be affected by wind, the party responsible for off-loading the tank shall secure the tank to keep total control of the vessel while handling. Since there are multiple ways that your tank can arrive the following figures are to be used as a general outline when offloading your storage tank. Assmann recommends hiring a skilled rigging company for both safety and to prevent damage to your tank. See figure #1, #2, and #3 for suggestions on how to handle the tanks when off loaded. **Note, Do Not use factory-installed fittings as lifting lugs.**



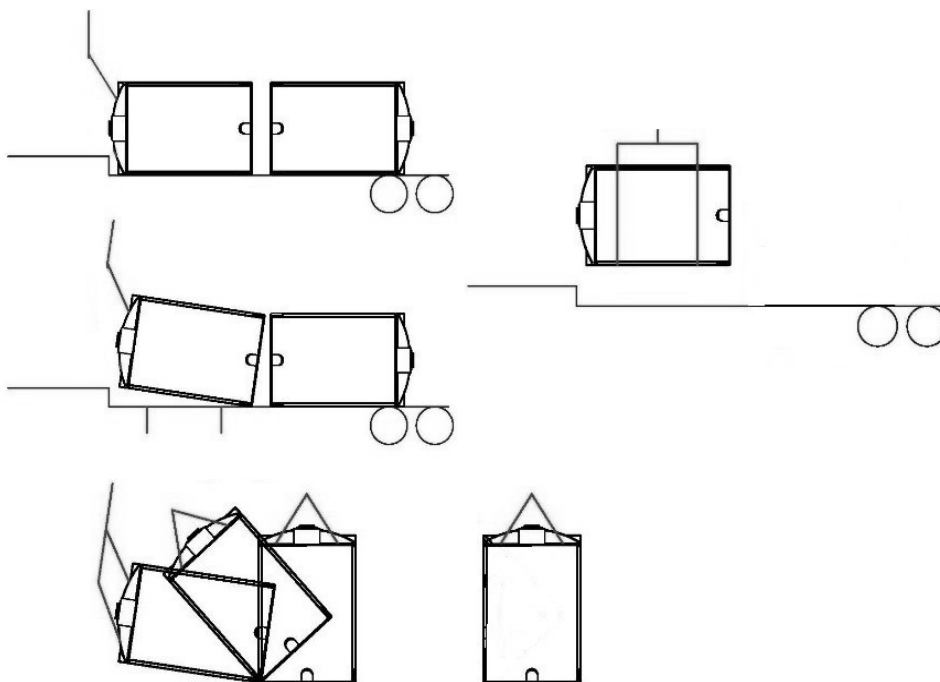
Using an overhead lifting device, make a choker collar and grasp top one-third of the tank while gently raising. Lower onto permanent site. Use caution to prevent the tank from slipping on the foundation.



Insert 4-in. x 4-in. wooden beam through the top of the manway, lift and deliver to permanent site. Units over 400 lb. may require steel I-beam in place of the wooden beam.

Often Assmann tank arrive laying on their side. When your tank arrives in this position it is required to make multiple lifts in order to properly handle the storage tank. Shown below are basic steps necessary to properly off load the tank from the truck.

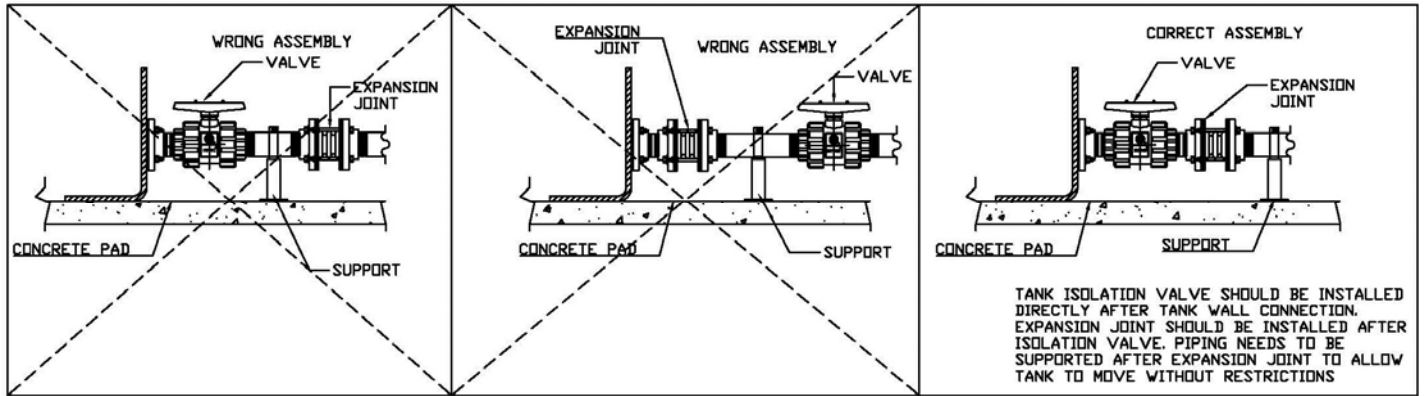
1. Attached crane to top lifting points or through the manway opening on the storage tank.
2. Lift the top portion of the storage tank and place straps across the bed of the truck. Then lay the tank back down onto the truck over the straps.
3. Reattach the crane to the straps beneath the tank. Then lift the tank in the horizontal position and place on a solid foundation. Reattach the crane to the top lifting points or manway opening.
4. While maintaining control of the tank slowly upright the tank to the standing position.
5. Once the tank is upright. Lift the tank into its final position. Be sure to follow the instructions within this manual to prepare the tank site.



Tank Piping

All pipes, valves and other accessories must be independently supported. **Do not support piping, valves or other accessories with tank connections.**

Note: Flexible expansion joints and or flexible hoses must be used on all sidewall fittings to allow the tank to expand and contract while filling or draining. **Not using an expansion joint or flexible hose will result in premature failure of the vessel.**



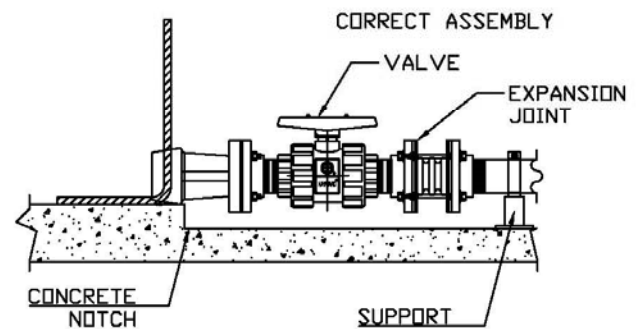
Assmann recommends that a hydro-test be performed after the installation is complete to ensure all piping has been installed properly.

Assmann offers a Full Drain Outlet (FDO) assembly on some of our storage tanks. When installing tanks with the FDO connection it is critical that the tank connection be plumbed correctly and that the tank pedestal or pad is designed to hold the storage tank properly and not restrict the movement of the nozzle. The figure shown below has critical pedestal dimensions along with an outline of proper piping procedures.

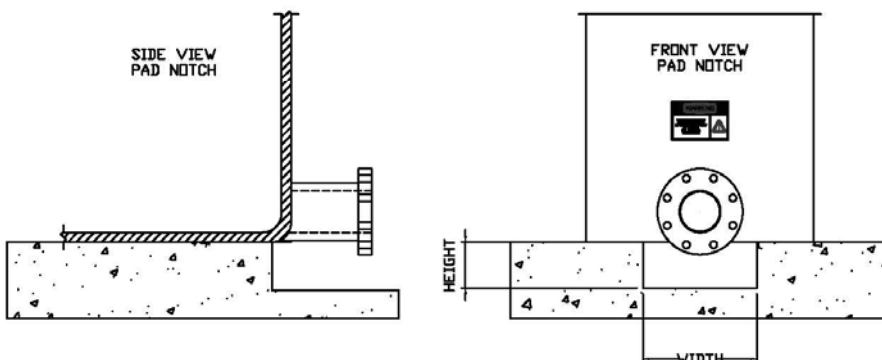
MINIMUM NOTCH WIDTH RECOMMENDED					
TANK DIAMETER	86"	96"	105"	119"	143"
NOTCH WIDTH 3" FDO	10 1/2"	10 1/2"	10 1/2"	10 1/2"	10 1/2"
NOTCH WIDTH 4" FDO	12"	12"	12"	12"	12"

MINIMUM PAD HEIGHT RECOMMENDED					
TANK DIAMETER	86"	96"	105"	119"	143"
PAD HEIGHT 3" FDO	7"	7"	7"	7"	7"
PAD HEIGHT 4" FDO	8"	8"	8"	8"	8"

MINIMUM PAD DIAMETER RECOMMENDED		
TANK DIAMETER	PAD DIAMETER	PAD WITH RESTRAINT
86"	89"	117"
96"	99"	127"
105"	109"	137"
119"	123"	151"
143"	148"	176"



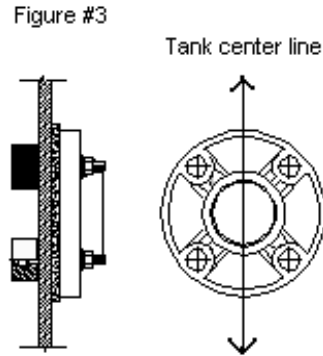
TANK ISOLATION VALVE SHOULD BE INSTALLED DIRECTLY AFTER TANK WALL CONNECTION. EXPANSION JOINT SHOULD BE INSTALLED AFTER ISOLATION VALVE. PIPING NEEDS TO BE SUPPORTED AFTER EXPANSION JOINT TO ALLOW TANK TO MOVE WITHOUT RESTRICTIONS



Installation of Fittings and Accessories

Flange Fitting Assembly

1. Locate on the tank where you want to place the fitting and mark the tank.
2. Place the flange on the tank and trace the center hole and the bolt holes on the flange. **Note: The bolt holes must straddle the centerline of the tank.** See figure #3



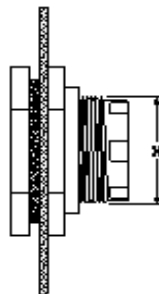
3. Drill pilot holes in the center of each hole traced using a 1/4" drill.
4. For the center hole you will need a hole saw the same size as the flange. **Example:** A two-inch flange will require a two-inch hole saw.
5. Carefully drill out the center hole with the hole saw.
6. Use a 1/2" drill to finish the bolt holes. The bolts should fit snug when placed through the holes.
7. Trim all burrs inside and out that may have been caused by drilling.
8. Place the bolts through the tank wall so the threads are outside and the gasket head is on the inside.
9. Slip the flange gasket over the threads on the bolts. Push the gasket flush against the tank wall.
10. Slip the flange over the bolts.
11. Coat the threads of the bolts with anti-seize to keep the threads from galling.
12. Place the flat washer, lock washer, and nut on the bolt threads and torque to 11-ft. lbs.
13. Hydro-test before introducing chemical.

Installation of Bulkhead and Self-Aligning Dome Fittings

Note: Do not install self-aligning dome fittings in the sidewall of the tank. **Self-aligning fittings are for top use only.**

1. Locate on the tank where you want to place the fitting and mark the tank. **Do not locate sidewall fittings too close to the bottom radius on tank.**
2. Drill a pilot hole using a 1/4" drill.
3. Measure the body of the bulkhead fitting you intend to install. See figure #4

Figure #4



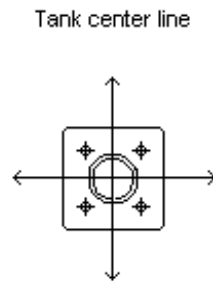
4. Using a hole saw that is slightly larger than the body of the bulkhead fitting, carefully drill the access hole.

5. Trim all burrs inside and out that may have been caused by drilling.
6. Place the body of the bulkhead fitting with the gasket through the hole from the inside.
7. Thread the nut of the bulkhead on hand tight. Hold the body of the bulkhead fitting steady and tighten the nut another ¼ to ½ turn.
8. Hydro-test before introducing chemical.

Installation of Stainless Steel Bulkhead Fitting

1. Locate on the tank where you want to place the fitting and mark the tank.
2. Place the backer plate on the tank wall and trace the center hole and the bolt holes. **Note: The bolt holes must straddle the centerline of the tank.** See figure #5

Figure #5



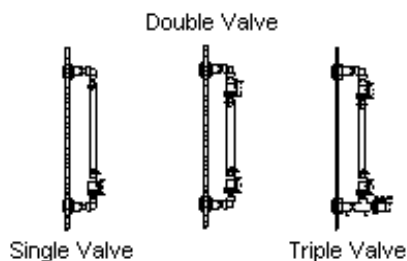
3. Drill pilot holes in the center of each hole traced using a ¼" drill.
4. For the center hole you will need a hole saw slightly larger than the outside diameter of the pipe nipple (male fitting) or coupler (female fitting).
5. Carefully drill out the center hole with the hole saw.
6. Use a 3/8" drill to finish the bolt holes. The bolts should fit fairly snug when placed through the holes.
7. Trim all burrs inside and out that may have been caused by drilling.
8. Install the body of the bulkhead with the gasket through the inside of the tank.
9. Slip the backer plate over the threads and the pipe connection. Push the plate flush against the tank.
10. Coat the threads of the bolts with anti-seize to keep the threads from galling.
11. Place the lock washer and nut on the threads and torque to 11-ft. lbs.
12. Hydro-test before introducing chemical.

Installation of Sight-glass Assembly

Normally, the bulkhead fittings for the sight-glass assembly will be factory installed. If not, follow instructions on how to install bulkhead fittings. **Sight-glass assemblies are normally packaged and shipped with the tanks to avoid damage in transit.**

Assmann Corporation offers three styles of sight-glass assemblies. See figure #6 for the style you received.

Figure #6



1. Coat the threads of the bottom assembly with pipe joint compound and thread into the bottom bulkhead fitting. **Do not over tighten.** Align the hose barb in the vertical position so the barb is pointing straight up.
2. Follow the same steps for the top assembly. This time the hose barb will point down.

3. Cut the flexible PVC tubing to the necessary length. Slip the hose clamps over the tubing and slide the tubing over the hose barbs.
4. Tighten the hose clamps snug over the tubing and barbs.
5. Hydro-test before introducing chemical.

Installation of Fill Line Assembly

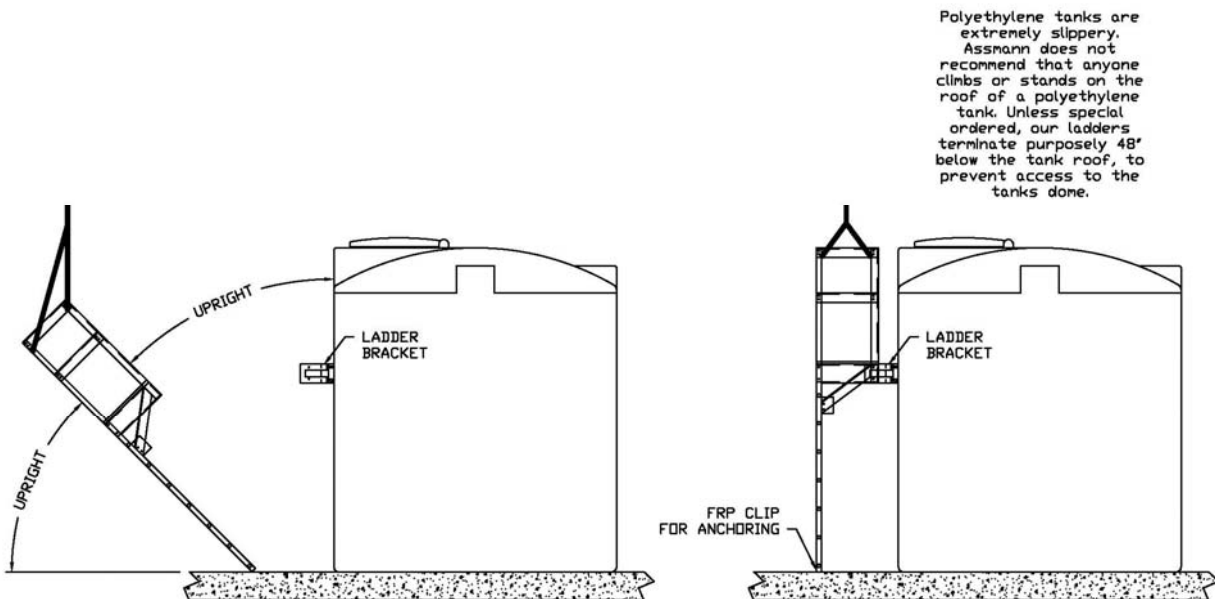
1. Remove the ball valve from the fill line assembly.
2. Slip the threaded end of the fill line through the bracket on the sidewall of the tank.
3. The fill line will have a half union with o-ring. Carefully remove the tape that holds the o-ring in place while shipping. Place the o-ring in the groove cut into the union and thread the two halves back together.
4. Use pipe joint compound on the pipe threads at the bottom of the fill line assembly and reinstall the ball valve.
5. Hydro-test the assembly before introducing chemical.

Installation of Bolted and Gasketed Cover

1. Place the flat plate on the top of the tank and mark out the hole pattern.
2. Drill $\frac{1}{4}$ " pilot holes in the center of each hole marked on the tank.
3. Drill each pilot hole with a $\frac{15}{32}$ " drill.
4. Thread the holes with a $\frac{1}{2}$ -13 tap.
5. Set the gasket on the tank top and line up the holes.
6. Place the flat plate on the gasket and carefully thread one of the PVC bolts into the tank. **Do not over tighten.**
7. Check each existing hole for alignment and continue installing the remainder of the bolts.

Installation of Ladder Assembly

1. Assmann Corporation will have already pre-fit your ladder assembly to the tank prior to shipping.
2. After setting tank in place. Situate ladder so that it can be safely stood up and fastened into the existing standoff bracket installed on the side of the storage tank. ***It is necessary to have the ladder held in place by proper crane or safety equipment, to prevent tipping during installation.***
3. The standoff bracket installed on the tank should snugly fit against the ladder.
4. Install factory supplied bolts through the standoff bracket and ladder. Loosely install bolts, do not tighten.
5. While still supporting the ladder drill anchors in the concrete through the angle supports located on the lower at the base of the ladder. Ladders that are not anchored at the base are not safe to use.
6. Install proper anchors to hold ladder base in place.
7. After lower portion of ladder is fastened securely, tighten bolts at upper ladder support bracket.
8. Once all hardware is tightened, remove crane or ladder support. ***Note: Polyethylene tanks are extremely slippery when wet. Assmann does not recommend that anyone climbs or stands on the roof of a polyethylene tank. Unless special ordered, our ladders terminate purposely 48" below the tank roof, to prevent access to the tanks dome.***



Installation of Tie Down Assembly

Assmann Corporation offers multiple types of restraint systems for our storage tanks. We offer a passive type restraint and also a wind load / Seismic restraint. Please refer to the instructions to your specific type of restraint. **Note, Assmann does not provide any type of concrete anchors with either of our restraint systems. We do not provide engineering or calculations outlining foundation requirements.**

Passive Restraints

1. Place the straps of the tie down assembly around the bottom of the tank.
2. Slip the carriage bolts through the precut holes in the center of each strap.
3. Bolt the straps loosely together so you will be able to slide the straps up into place.
4. Slide the strap up the tank so that the legs can be fastened to the carriage bolts.
5. Mark the holes in the legs where the anchors will be installed and rotate the assembly slightly for drilling.
6. Drill and install the anchors. Rotate the assembly back to its original location.
7. Carefully snug the straps around the tank. **CAUTION: Do not over tighten the straps around the tank.**
8. Tighten the legs to the pad using anchors.

Wind Load & Seismic Restraints

1. Read all installation instructions prior to assembly process.
2. Cut tether attaching restraint cables loose from top mounted restraint lugs. This will ease installation further through the process.
3. Allow upper restraint cables to hang freely from tank roof. This will help position the base restraint clips around the storage tank. It is critical to the restraint systems design that all base clips are evenly spaced around the storage tank.
4. Loop base cables through base restraint clips and attached to turn buckles with supplied hardware.
5. Attached upper restraint cables to turnbuckles.
6. Double-check alignment of upper restraint lugs and base restraint clips.
7. Sit base restraint clips against sidewall of storage tank and mark anchor bolt holes on concrete.
8. Drill all anchor bolt holes and epoxy anchors into place.
9. Install base restraint clips over anchors and tighten bolts.
10. Fill tank with water to allow tank to natural "squat" into place.
11. Tighten turnbuckles hand tight, plus 1 full revolution of turnbuckle. Note that cables to do need to be pre-tensioned to a specific value. Pre-tensioning of restraint cables, can cause excessive force if the restraint system is placed under seismic or wind loading.
12. Installation is complete.

