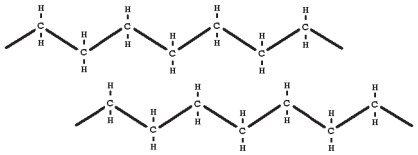
Resin Materials

Polyethylene resins can be hard to identify after a tank has been installed. Common misconceptions are HDLPE is the same as HDXLPE. The following pictures will help you determine materials.

The picture on the right is a Linear HDLPE tank: Notice the "White color". Linear PE is a weldable, FDA approved material. Used commonly for day tanks and small chemical feed applications.

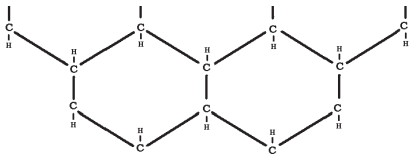
On the left, is a Crosslink HDXLPE tank: Notice the "off White / Yellow color". Crosslink polyethylene is used for large industrial bulk storage applications.

Linear PE molecules when molded bond "end to end" as shown below.



Idealized two-dimensional structure conventional medium density polyethylene

Crosslink PE molecules bond on all four sides forming an "X" type bond. Crosslink has a stronger molecular structure than linear PE.



Idealized two-dimensional structure crosslinked high density polyethylene

Inspection Guidelines

Polyethylene tanks are a cost-effective method for bulk chemical storage. Routine inspections are required to maintain a safe environment.

The following guidelines should be followed:

- ➢ Never enter a tank without following OSHA approved guidelines.
- ➢ Check each nozzle monthly for possible seepage or leaks.
- ➢ Make sure all flexible expansion joints are in good working condition.
- ➢ Flush your tank every 12 months.
- ➢ Do not allow tanks to be pressurized. Never use more than 7psi when clearing fill lines.
- ➢ Do not change the chemical service without checking chemical compatibility of all equipment, fittings and secondary piping.
- ➢ If the vessel has been in service three years or longer, check the inside and outside surface of the tank for crazing, cracking or unusual discoloration. ***See Inserts for pictures of UV failure and signs of Stress Cracking.***
- ➢ Keep a log of all inspections.

Assmann®

Polyethylene Tank Inspection Guide

ISO 9001:2000 REGISTERED FIRM

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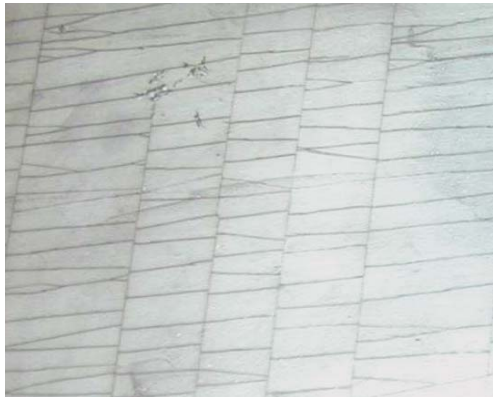
Ultra-Violet Exposure

Over-exposure to Ultra-violet rays is pictured below. Quality polyethylene resins are compounded with Ultra-violet stabilizer prior to being distributed to the tank manufacturer's facility.

Tanks that are installed in areas that have extreme amounts of UV exposure should be sheltered from the environment, insulated or colored for additional protection.

Common in the industry, tank manufacturers reduce wall thickness by using less resin in the upper sidewall and dome of the tank. This makes the tank roof more susceptible to ultraviolet damage. Assmann polyethylene tanks are constructed with uniform-wall thickness from top to bottom. This added thickness gives additional protection to Ultra-violet exposure and extends the service life of the tank.



A common test method to see if your tank has undergone Ultra-violet attack is to use water based stain or marker and color in a small area that has been exposed to sunlight. This will fill any voids in the polyethylene material making cracks visible. Areas to check are the dome and lower sidewall of the tank.

Tank Failure

Polyethylene tanks are the most corrosion resistant method for storage of harsh chemicals. Improper plumbing attachments, Chemical and UV attacks are the most common causes for failure. Tanks can also fail due to age. Pictured below is a polyethylene tank that failed due to age. As you can see in the picture this tank has cracked a few inches above the tank floor. Typically cracks will develop near the tank base where the tank expands and contracts under normal operating conditions. When inspecting a tank always look near the tank's knuckle radius.

This picture is a chemical stress crack in a Crosslink polyethylene tank. Stress cracks normally develop at or near tank sidewall connections. A Crosslink tank will typically develop a stress crack prior to complete tank failure. This gives the end user warning to get the tank removed from service. Normally a Linear polyethylene tank will not give this type of warning before complete failure.

Gathering Information

Polyethylene tanks are most commonly damaged when they are in transit or being off-loaded at a customer's site. Pictured below is a tank that has been gouged. This customer is using a quarter to gauge the penetration into the tank. If you can provide an accurate depth of a gouge, a reputable manufacturer can calculate the remaining thickness of the tank and give recommendations on how to proceed. A tank manufacturer or a qualified representative should be contacted immediately when damage is found.

Tanks with damage similar to the picture shown below should be reported to the manufacturer, and evaluation should take place prior to the tank being placed in service.