POLYWEST®
liquid handling products

POLY TANK INSPECTION GUIDE

Instructions on how to periodically check for stress cracking caused by chemicals, handling abuse & environmental degradation.

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What is an Environmental Stress Inspection?

As it pertains to a molded polyethylene tank, the Environmental Stress Inspection is a simple procedure for periodically examining a tank for possible evidence of environmental damage.

Damage caused by ultraviolet attack, chemical exposure, extreme temperatures, impacts, and other environmental conditions limit the useful life expectancy of all tanks. Environmental Stress Cracking is one of the natural results of the effects of the environment on polyethylene. The environment can also affect gaskets, fittings, valves, caps, and other tank accessories.

Environmental Stress, when ignored, can lead to problems and ultimately to the loss of chemical. All polyethylene tanks should be checked periodically, using the procedure outlined below.

ENVIRONMENTAL STRESS INSPECTION PROCEDURE:

Visually inspect the tank for obvious cuts, cracks, punctures, or leaks that could contribute to tank failure.
Look for signs of extensive brittleness, swelling, or softening of the tank walls. Extensive brittleness could be determined by observation of a break, crack, or missing portion of the molded tank. Swelling would be apparent if a tank is deformed in a manner not consistent with the accepted normal deflections seen when the tank is filled. Softening of the tank walls would be observed by pressing on the surface of the tank. A spongy feel to the material could indicate that the material is being degraded or permeated by the contents of the tank. Permeation of the tank wall by a chemical can sometimes be seen as a discoloration of the tank wall penetrating the surface of the material. This discoloration will continue into the wall to the depth of the permeation of the chemical. Permeation can cause a discoloration of the entire thickness of the tank wall once permeation has reached the outer surface of the container. The effects of permeation on the polyethylene tank wall may range from no serious effect to a complete breakdown of the physical properties of the material. Appearance of any of these symptoms should be considered a cause for concern and proper precautions should be taken up to and including removal of the tank from service.

Inspect all fittings.
Look for broken parts, excessive corrosion, deteriorated surface texture, and cracks, wear marks, or other signs of potential leaks. Periodic scheduled replacement of fittings may be necessary.

Inspect all gaskets for signs of deterioration.
In many cases the gaskets will have a shorter life than the tank itself. Look for discoloration, bulges, checking, or crazing of the gasket material. Many gaskets cold flow, or take a set, and become less effective over a period of time. This can lead to gasket failure or the inability to re-use a gasket after it has been removed. Chemicals also may attack gaskets making proper gasket material selection important. Periodic scheduled replacement of the gaskets may be necessary.

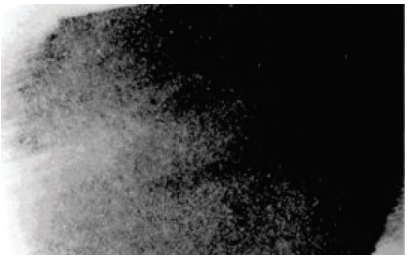
Inspect all valves and/or pumps that may be connected to, or installed in/on, the tank.
This inspection should include all hoses and connections. Look for signs of wear, damage caused by impact, misuse, and damage caused by the environment in which the tank is being used. Periodic scheduled replacement of these components may be necessary.

ENVIRONMENTAL STRESS CRACKING CHECKLIST:

Select an area near the top of the tank where environmental stress cracking usually occurs first. In the case of an impact to the tank, select the area in which the impact occurred and any surrounding areas which may have been affected.

1. With any black water-soluble marker, mark out an area two or three inches square. Completely ink the entire interior of the square.
2. With a soft cotton cloth, quickly rub the excess ink off the test area. DO NOT ALLOW THE INK TO DRY.
3. Look for signs of stress cracking which will appear as a web or "crazing" of fine lines that have filled with ink.
4. Compare the test area with the photos on these pages to determine the degree of stress cracking or impact damage.

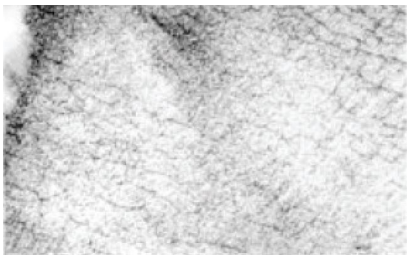
NON-STRESSED POLY



This image shows a tank in good condition in the area the test was performed.

Check again at the next periodic inspection.

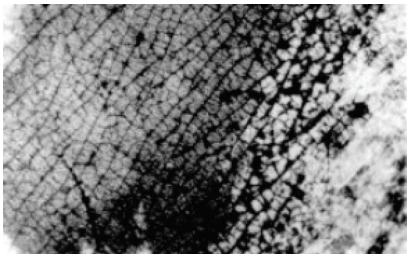
EVIDENT STRESS CRACKING



This photo shows a tank displaying definite signs of Environmental Stress Cracking.

It is strongly recommended that this tank be replaced.

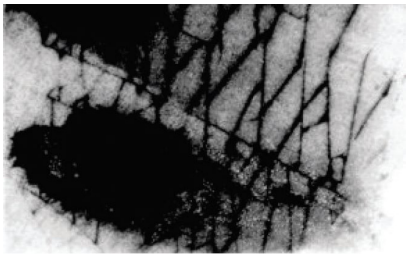
ADVANCED STRESS CRACKING



This photo shows a tank that has suffered severe environmental damage.

Replace tanks with this type of stress-cracking immediately. DO NOT USE THIS TANK.

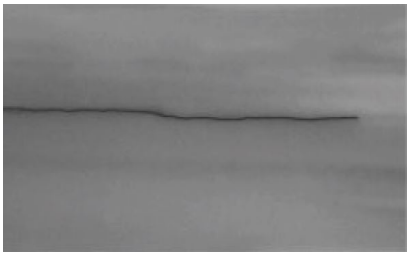
IMPACT DAMAGED



This photo shows a tank that has cracked due to an impact.

Replace tanks with this type of damage immediately. DO NOT USE THIS TANK.

PERMEATION-DAMAGED



This photo shows a tank that has cracked due to permeation of a chemical through the entire wall thickness of the tank.

Replace tanks with this type of damage immediately. DO NOT USE THIS TANK.

REPEAT STEPS 1-4 AT THESE OTHER POTENTIALLY STRESSED AREAS:

- On the sides of the tank.
- Near fittings and outlets.
- Where the tank receives the most direct sunlight.
- Corners, edges, lugs and so forth.

VISUAL LIGHT PROCEDURE

Use the following visual light procedure to inspect the entire tank for signs of stress cracking:

1. Locate a light source of at least 30 watts. A higher-powered light source will make inspection easier (especially on thicker tank walls). The light source should be white light (avoid yellow colour spectrum lights). Do not let the light source heat the tank material significantly by either direct contact of radiant heat. Keep the light a safe distance from the tank (1-2 feet minimum) and in motion, to avoid spot heating. (A LED flashlight is a good choice due to their low operating temperatures)

2. Inspect the tank from the outside (with the light source inside the tank) and from the inside* (with the light source outside the tank) as much as feasible.

3. Look for lines with different light intensity or colour than the areas immediately next to the lines. These lines may be stress cracks in the tank material. Investigate any lines more closely with light inspection and feel for material separation at any suspect area. The water soluble maker technique as outlined above may be used to check suspect stress crack areas.

4. Inspect potentially stressed areas on the sides of the tank, tank corner/radius, near fittings and outlets, or any area which may have been impacted/stressed abnormally.

5. If stress cracks are found, monitor closely and plan for repair or replacement of the tank.

*** When entering tanks follow all local guidelines and regulations to insure accidents are prevented.**

****Please note that this testing should be done in addition to and not in lieu of other standard inspection procedures.**