



Expansion and Contraction Considerations and Recommendations

A White Paper from Assmann

This document is to serve as a general guideline for installation of polyethylene storage tanks.

Polyethylene tanks expand and contract under normal service conditions. Picture plastic which, unlike FRP or steel, has more of an elastomeric property than a rigid structure. This means there are multiple factors that might influence movement on a polyethylene tank. Temperature changes, as well as being filled and emptied can cause polyethylene tanks to expand and contract.

At Assmann, we recommend that expansion joints or flexible hoses are used on sidewall connections to help eliminate problems caused by rigid plumbing versus movement of tanks. However, we understand that expansion joints and flexible hoses are a maintenance concern and customers may prefer not to install these items. If you have any uncertainty on the practicality of these expansion joints for your storage tanks, please contact us with any questions or concerns.

The tables shown to the right are general guidelines on what to expect for movement, loads and vertical deflection on polyethylene tanks.

Please make note that all information listed is variable based on site conditions, i.e., fill and discharge rates, ambient temperatures, indoor or outdoor installations. All information listed above is based on indoor conditions at 70-degree Fahrenheit on vertical flat bottom tanks. Assmann will not warrant tank failures as a direct result of rigid or unsupported plumbing.

Vertical tank expansion and contraction	
20 - 1,000 Gallon Tanks	0" - ¼" Expansion and Contraction
1,100 - 2,000 Gallon Tanks	¼" - ½" Expansion and Contraction
2,050 - 4,000 Gallon Tanks	½" - ¾" Expansion and Contraction
4,100 - 12,000 Gallon Tanks	¾" - 1 ¼" Expansion and Contraction

Vertical tank sidewall loading	
20 - 1,000 Gallon Tanks	Max Unsupported Load ½ to 1 lb.
1,100 - 2,000 Gallon Tanks	Max Unsupported Load 1 to 2 ½ lb.
2,050 - 4,000 Gallon Tanks	Max Unsupported Load 2 ½ to 6 lb.
4,100 - 12,000 Gallon Tanks	Max Unsupported Load 6 to 11 lb.

Vertical tank nozzle deflection based on 6" projection from tank wall	
20 - 1,000 Gallon Tanks	¼" = + or 4 Degrees
1,100 - 2,000 Gallon Tanks	½" = + or 10 Degrees
2,050 - 4,000 Gallon Tanks	¾" = + or 16 Degrees
4,100 - 12,000 Gallon Tanks	¾" = + or 24 Degrees

Note: Assmann requires all plumbing to be supported independent of tank to allow for free tank movement, i.e., hangers and flexible supports.

