Life Expectancy of a Polyethylene Storage Tank

Average life expectancy of a polyethylene tank is 15-20 years or even longer depending upon a variety of factors. Listed below are some of the major factors that help determine the life expectancy.

This information is based on our experience, research, and support from other published chemical resistance charts. It is believed to be reliable; it is, however, intended to be used only as a guide. Assmann Corporation of America assumes no responsibility in connection with its use.

Additional assistance should be requested if there are doubts about compatibility, sustainability, warranty, allowable transportability, or storage in Assmann products.

SERVICE TEMPERATURE LIMITATIONS

Cross-linked polyethylene: -40° F to +150° F
Linear polyethylene: -20° F to +120° F
Note: Constant service temperatures above 100° F greatly reduce useful tank life, please consult factory.

Ratings	Chemical Attack		
A	No Effect	Excellent	At ambient temperature
B	Minor Effect	Good	At ambient temperature
C	Moderate Effect	Fair	Additional research required
D	Severe Effect	NOT RECOMMENDED	
–	No Data		

Chemical Name	Polyethylene	Polypropylene	PVC	316 Stainless Steel	Titanium	Hastelloy C-276	Viton	EPDM
Acetic Acid* 1-10%	A	A	B	A	B	A	C	A
Acetic Acid* 10-60%	A	A	C	A	B	A	C	A
Acetic Acid* 80-100%	A	A	C	A	B	A	C	B
Aluminum Chloride-dilute	A	A	A	C	A	A	A	A
Aluminum Chloride-conc.	A	-	A	C	A	A	A	A
Aluminum Fluoride-conc.	A	A	A	C	A	B	-	A
Aluminum Sulfate-conc	A	A	A	A*	A	A	A	A
Alums (all types) conc***	A	A	A	A	A	A	A	A
Ammonia 100% Dry Gas	A	A	A	A	A	-	-	B
Ammonium Carbonate	A	A	A	A	A	B	B	C
Ammonium Chloride-sat'd	A	A	A	A	-	A	B	A
Ammonium Fluoride 20%	A	-	A	-	-	-	-	-
Ammonium Hydroxide 0,888 sg	A	A	A	A	A	A	B	A
Ammonium Metaphosphate sat'd	A	A	A	-	-	-	-	-
Ammonium Nitrate sat'd	A	A	A	A	A	A	B	A
Ammonium Persulfate sat'd	A	A	A	A	-	A	A	B

Chemical Name	Polyethylene	Polypropylene	PVC	316 Stainless Steel	Titanium	Hastelloy C-276	Viton	EPDM
Ammonium Sulfate sat'd	A	A	A	A	A	B	-	A
Ammonium Sulfide sat'd	A	-	-	A	A	B	D	A
Ammonium Thiocyanate sat'd	A	-	-	-	-	-	-	-
Amyl Alcohol* 100%	A	A	A	A	-	A	B	A
Aniline 100%	A	B	A	A	C	B	D	A
Antimony Chloride	A	-	-	-	-	-	-	A
Barium Carbonate sat'd	A	A	A	A	A	-	-	A
Barium Chloride	A	A	A	A	A	A	B	-
Barium Hydroxide	A	A	A	A	B	B	A	A
Barium Sulfate sat'd	A	A	A	A	-	-	A	A
Barium Sulfide sat'd	A	A	A	A	-	-	A	A
Benzene Sulfonic Acid*	A	D	-	-	-	-	-	A
Borax Cold sat'd	A	A	A	A	A	A	A	A
Boric Acid Dilute	A	A	A	A	A	A	A	A
Boric Acid Conc	A	A	A	A	-	A	A	A
Bromic Acid 10%	A	D	-	-	-	-	-	-

Chemical Stored: The first and most obvious factor is the chemical being stored and the operating parameters of the tank. High caustics, Acids and stress cracking agents are hard on polyethylene tanks. All of these have mild to moderate chemical attack on the plastic. Depending on the material, construction of the tank and the actual processing of the resin, chemicals will permeate or dry out the plastic. Operating temperature also has a significant impact on life expectancy. Higher temperatures affect the way the chemical reacts with the plastic. Assmann Corporation can provide tanks from various materials and with different thickness to help aid in the combat of both these factors.

Reference Chemical Resistance tables at this link.

Installation: The second factor is where your tank is located. Indoors, outdoors, temperature-controlled room? Exposure to UV rays? Almost all polyethylene has a UV stabilizer compounded into the resin to help protect the resin from being damaged by harmful UV rays. Assmann Corporation manufactures our tanks with a uniform thickness from top to bottom. This helps get additional resin to the roof of the tank where added thickness will help block out sunlight.

Venting: This is one of the most overlooked steps, but not any less important than the other processes. “I have a low feed rate” and “just storage tanks” are excuses used to answer why tanks are not vented properly. It is extremely important that polyethylene tanks are not over pressurized or placed under vacuum. Adequate vent size will always be based on flow rates and delivery rates; however, you can never have too much venting. Assmann recommends having a minimal vent of two times the largest inlet or outlet of your storage tank. Over pressurization and vacuum are the two leading causes of failure in a polyethylene storage tank.

Piping: Process piping is another step we find customers often overlooking. A polyethylene tank will always vary in size and shape. Polyethylene, unlike steel, will need to move when filling and emptying. Simple temperature changes outdoors will cause your tank to change in size. The use of flexible expansion joints is required on all sidewall connections. Rigid piping will not allow the tank to expand and contract, thus causing undo stress on the tank leading to leaks and eventual failure. Equally important is supporting your process piping; unnecessary weight hanging from your storage tank will cause stress on the tank and lead to future problems. It’s important to always support your piping in a manner that will prevent stress on your tank. Expansion joints will protect your tank from weight of process piping, pump vibration and expansion issues.

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