



Expansion Tank Sizing

Sizing Procedure

Job:

1. Enter Total System Water Content _____ gal.
2. a. Enter Minimum System Temperature _____ °F
- b. Enter Maximum System Temperature _____ °F
- c. Enter Expansion Factor From Table 1 _____
3. Calculate Expanded Water Volume
(Multiply line 1 by line 2c) _____
4. a. Enter Minimum System Pressure (P1) _____ psig
- b. Enter maximum System Pressure (Po) _____ psig
- c. Enter acceptance Factor From Table 2 _____
5. Calculate Total Tank Volume Required _____ gal.
(Divide line 3 by line 4c)
6. Select Tank from Product Data Table--Side 1 Model _____

Note: When using WPA Tanks, amount of expanded water generated (Line 3) must not exceed acceptance volume of tank.

Table 1 - Net Expansion of Water

Maximum Temp. °F	Initial Temperature °F													
	40	45	50	55	60	65	70	75	80	85	90	95	100	
50°	0.00006	0.00008												
55°	0.00025	0.00027	0.00019											
60°	0.00055	0.00057	0.00049	0.0003										
65°	0.00093	0.00095	0.00087	0.00068	0.00038									
70°	0.00149	0.00151	0.00143	0.00124	0.00094	0.00056								
75°	0.00194	0.00196	0.00188	0.00169	0.00139	0.00101	0.00045							
80°	0.0026	0.00262	0.00254	0.00235	0.00205	0.00167	0.00111	0.00066						
85°	0.00326	0.00328	0.0032	0.00301	0.00271	0.00233	0.00177	0.00132	0.00066					
90°	0.00405	0.00407	0.00399	0.0038	0.0035	0.00312	0.00256	0.00211	0.00145	0.00079				
95°	0.00485	0.00487	0.00479	0.0046	0.0043	0.00392	0.00336	0.00291	0.00225	0.00159	0.0008			
100°	0.00575	0.00577	0.00569	0.0055	0.0052	0.00482	0.00426	0.00381	0.00315	0.00249	0.0017	0.0009		
105°	0.00671	0.00673	0.00665	0.00646	0.00616	0.00578	0.00522	0.00477	0.00411	0.00345	0.00266	0.00186	0.00096	
110°	0.00771	0.00773	0.00765	0.00746	0.00716	0.00678	0.00622	0.00577	0.00511	0.00445	0.00366	0.00286	0.00196	
115°	0.00879	0.00881	0.00873	0.00854	0.00824	0.00786	0.0073	0.00685	0.00619	0.00553	0.00474	0.00394	0.00304	
120°	0.01004	0.01006	0.00998	0.00979	0.00949	0.00911	0.00855	0.0081	0.00744	0.00678	0.00599	0.00519	0.00429	
125°	0.01111	0.01113	0.01105	0.01086	0.01056	0.01018	0.00962	0.00917	0.00851	0.00785	0.00706	0.00625	0.00536	
130°	0.01236	0.01238	0.0123	0.01211	0.01181	0.01143	0.01087	0.01042	0.00976	0.0091	0.00831	0.00751	0.00661	
135°	0.01368	0.0137	0.01362	0.01342	0.01313	0.01275	0.01219	0.01174	0.01108	0.01042	0.00963	0.00883	0.00793	
140°	0.01501	0.01503	0.01495	0.01476	0.01446	0.01408	0.01352	0.01307	0.01241	0.01175	0.01096	0.01016	0.00926	
145°	0.01643	0.01645	0.01637	0.01618	0.01588	0.0155	0.01494	0.01449	0.01383	0.01317	0.01238	0.01158	0.01068	
150°	0.01787	0.01787	0.01779	0.0176	0.0173	0.01692	0.01636	0.01591	0.01525	0.01459	0.0138	0.013	0.0121	
155°	0.01937	0.01939	0.01931	0.01912	0.01882	0.01844	0.01788	0.01743	0.01677	0.01611	0.01532	0.01452	0.01362	
160°	0.02092	0.02094	0.02086	0.02067	0.02037	0.01999	0.01943	0.01897	0.01831	0.01765	0.01686	0.01606	0.01516	
165°	0.02252	0.02254	0.02246	0.02227	0.02197	0.02159	0.02103	0.02058	0.01992	0.01926	0.01847	0.01767	0.01677	
170°	0.02418	0.0242	0.02412	0.02393	0.02363	0.02325	0.02269	0.02224	0.02158	0.02092	0.02013	0.01933	0.01843	
175°	0.02588	0.0259	0.02582	0.02563	0.02533	0.02495	0.02439	0.02394	0.02328	0.02262	0.02183	0.02103	0.02013	
180°	0.02763	0.02765	0.02757	0.02738	0.02708	0.0267	0.02614	0.02569	0.02503	0.02437	0.02358	0.02278	0.02188	
185°	0.02941	0.02943	0.02935	0.02916	0.02886	0.02848	0.02792	0.02747	0.02681	0.02615	0.02536	0.02456	0.02366	
190°	0.03127	0.03129	0.03121	0.03102	0.03072	0.03034	0.02978	0.02933	0.02867	0.02801	0.02722	0.02642	0.02552	
195°	0.03314	0.03316	0.03308	0.03289	0.03259	0.03221	0.03165	0.0312	0.03054	0.02988	0.02909	0.02829	0.02739	
200°	0.0351	0.03512	0.03504	0.03485	0.03455	0.03417	0.03361	0.03316	0.0325	0.03184	0.03105	0.03025	0.02935	
205°	0.03707	0.03709	0.03701	0.03682	0.03652	0.03614	0.03558	0.03513	0.03447	0.03381	0.03302	0.03222	0.03132	
210°	0.03911	0.03913	0.03905	0.03885	0.03856	0.03818	0.03762	0.03717	0.03651	0.03585	0.03506	0.03426	0.03336	
215°	0.0412	0.04122	0.04114	0.04095	0.04065	0.04027	0.03971	0.03926	0.0386	0.03794	0.03715	0.03635	0.03545	
220°	0.04335	0.04337	0.04329	0.0431	0.0428	0.04242	0.04186	0.04141	0.04075	0.04009	0.0393	0.0385	0.0376	
225°	0.04549	0.04551	0.04543	0.04524	0.04494	0.04456	0.044	0.04355	0.04289	0.04223	0.04144	0.04064	0.03974	
230°	0.04762	0.04764	0.04756	0.04737	0.04707	0.04669	0.04613	0.04568	0.04502	0.04436	0.04357	0.04277	0.04187	
235°	0.04991	0.04993	0.04985	0.04966	0.04936	0.04898	0.04842	0.04797	0.04731	0.04665	0.04586	0.04506	0.04416	
240°	0.0522	0.05222	0.05214	0.05195	0.05165	0.05127	0.05071	0.05026	0.0496	0.04894	0.04815	0.04735	0.04645	

Table 2 - Acceptance Factors

Po Maximum Operating Press. PSIG	P1 - Minimum Operating Pressure at Tank (PSIG)												
	5	10	12	15	20	25	30	35	40	45	50		
30	0.56	0.477	0.403	0.336	0.224	0.112							
40	0.64	0.548	0.512	0.457	0.366	0.274	0.183	0.091					
50	0.696	0.618	0.587	0.541	0.464	0.386	0.309	0.232	0.155	0.078			
60	0.736	0.669	0.643	0.602	0.536	0.469	0.402	0.335	0.268	0.201	0.134		
70	0.767	0.708	0.685	0.649	0.59	0.531	0.472	0.413	0.354	0.295	0.236	0.17	
80	0.792	0.739	0.718	0.686	0.634	0.581	0.528	0.475	0.422	0.37	0.317	0.26	
90	0.812	0.764	0.745	0.716	0.669	0.621	0.573	0.525	0.478	0.43	0.382	0.33	
100	0.828	0.785	0.767	0.741	0.698	0.654	0.61	0.567	0.523	0.479	0.436	0.393	
110	0.842	0.802	0.786	0.762	0.723	0.682	0.642	0.601	0.561	0.521	0.481	0.441	
120	0.854	0.817	0.802	0.78	0.742	0.705	0.668	0.631	0.594	0.557	0.52	0.48	
125	0.859	0.823	0.809	0.787	0.752	0.716	0.68	0.644	0.608	0.573	0.537	0.5	

Note: If pressures exceed tables use formula

$$1 - \frac{P1 + 14.7}{Po + 14.7} \text{ to obtain factor}$$



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