

Get the Facts

Water

One gallon of fresh water 8.333 lbs.
 One cubic foot of water 7.48 gallons
 One cubic foot of water 62.428 lbs.
 (at 39.2°F maximum density)
 One cubic foot of water 59.83 lbs.
 (at 212°F - boiling point)
 One U.S. gallon 231 cubic inches
 The capacity of a cylinder in gallons is equal to the length in inches multiplied by the square of the diameter in inches x .0034.
 A water column one foot high exerts a pressure of .4333 pounds per square inch.
 Doubling the diameter of a pipe increases its capacity four times.

pH $\left\{ \begin{array}{l} \text{above 7.0} \quad \text{alkaline} \\ \text{7.0} \quad \text{neutral} \\ \text{below 7.0} \quad \text{acid} \end{array} \right.$

1 Grain per gallon = 17.1 parts per million.
 Water expands 4.34% heated from 40° to 212°.

Electricity

Amps = $\frac{KW \times 1000}{Volts \times 1.732}$ 1 KW hour will evaporate 3.5 lbs. of water from and at 212°F

Amps (1 phase) = $\frac{KW \times 1000}{Volts}$ 1 KW hour = 3412 BTU
 1 BPH = 34.5 lbs. of steam at 212°

GPH = $\frac{KW \times 3412}{8.33 \times \text{Temp. Rise}}$ 1 BPH = 33,475 BTU
 1 BPH = 9.8 KW

Recovery Formula

Formula for recovery in gallons per hour for any degrees F rise:

$$\frac{\text{Rated Rec. in Gals. Hr.} \times 100}{\text{Desired Degrees F Rise}} = \text{Gallons Hour}$$

Storage Tank Capacities in Gallons

Length in Feet	*Tank Diameter - Inches														
	20	22	24	30	36	42	48	54	60	66	72	78	84	90	96
1	16	20	24	37	53	72	94	120	145	180	210	250	290	330	375
2	32	40	48	74	106	144	188	240	290	360	420	500	580	660	750
3	48	60	72	110	159	216	282	360	435	540	630	750	870	990	1125
4	66	80	96	147	212	288	376	480	580	720	840	1000	1160	1320	1500
5	82	100	120	184	265	360	470	600	725	900	1050	1250	1450	1650	1875
6	98	120	144	220	317	432	564	720	870	1080	1260	1500	1740	1980	2250
7	114	140	168	257	370	504	658	840	1015	1260	1470	1750	2030	2310	2625
8	131	160	192	294	423	576	752	960	1160	1440	1680	2000	2320	2640	3000
9	147	180	216	330	476	648	846	1080	1305	1620	1890	2250	2610	2970	3375
10	163	200	240	367	529	720	940	1200	1450	1800	2100	2500	2900	3300	3750
11	180	220	264	404	582	792	1034	1320	1596	1980	2310	2750	3190	3530	4125
12	196	240	288	440	634	864	1128	1440	1740	2160	2520	3000	3480	3960	4500
13	212	260	312	477	687	936	1222	1560	1885	2340	2730	3250	3770	4290	4875
14	228	280	336	514	740	1008	1316	1680	2030	2520	2940	3500	4060	4620	5250
15	244	300	360	550	793	1080	1410	1800	2175	2700	3150	3750	4350	4950	5625
16	260	320	384	587	846	1152	1504	1920	2320	2880	3360	4000	4640	5280	6000

* To determine diameter when only the circumference is known, divide that figure by 3.1416 (π).

BTU Content of Fuels

	BTU's		BTU's
Electricity		Coal	
1 KW	3,412	1 lb.	10,000-15,000
		1 Ton	25 Million (approx.)
Gas		Oil	
1 lb. of Butane	21,300	1 Gal. #1 Fuel	136,000
1 Gal. of Butane	102,600	1 Gal. #2 Fuel	138,500
1 Cu. Ft. of Butane	3,260	1 Gal. #3 Fuel	141,000
1 Cu. Ft. Manufactured	530	1 Gal. #5 Fuel	148,500
1 Cu. Ft. of Mixed	850	1 Gal. #6 Fuel	152,000
1 Cu. Ft. of Natural	1,075	1 lb. of Gas = 28" Water Column	
1 lb. of Propane	21,600	1 lb. of Gas = 16 oz.	
1 Gal. of Propane	91,000		
1 Cu. Ft. of Propane	2,570		

Gas Pressure Conversion

1" W.C. = 0.0736" H.G. 1 PSIG = 2.72" W.C.
 1" W.C. = 248 Pa 1 mbar = 0.4016" W.C.
 1 oz./in.² = 1.73" W.C.

Steam

For 100 lb. steam/hr. you require 140,000 BTU/hr. @ 80% efficiency.

Pipe Sizes

Diameter in Inches	Area in Square Inches	Diameter in Inches	Area in Square Inches
3	7.06	17	226.98
4	12.56	18	254.47
5	19.63	19	283.53
6	28.27	20	314.16
7	38.48	21	346.36
8	50.26	22	380.13
9	63.61	23	415.48
10	78.54	24	452.39
11	95.03	25	490.87
12	113.10	26	530.93
13	132.73	27	572.56
14	153.94	28	615.75
15	176.71	29	660.52
16	201.06	30	706.86



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