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The Cost of Steam leaks

Steam leaks and worn out steam traps are a huge energy loss in the U.S. annually. We recommend that clients that have steam systems implement a steam trap maintenance system that checks steam traps on a monthly basis and no less than quarterly. The following formula and chart can be used to calculate the costs of steam losses in your system.

$$Q = \frac{L \times H \times E \times 10^{-6} \times C}{BE}$$

where: Q = Energy Lost ($)
L = Lb/Hr of steam lost = 38.29 lbs/hr (5/32" orifice, 50 psig)
H = Hours of operation = 8,760
E = Latent heat of steam at 50 psig = 912.2 Btu/lb
10^{-6} = MMBtu/Btu
C = Cost of gas per million Btu = $9.50
BE = Boiler Efficiency = 80%

$Q = (38.29)\ (8{,}760)\ (912.2)\ (10^{-6})\ ($9.50) / .80 = $3,663.40 Annually

STEAM LOSS THROUGH ORIFICES DISCHARGING TO ATMOSPHERE

Orifice Diameter (Inches)		STEAM FLOW (LBS./HOUR) when gauge pressure is: 2 PSIG	5 PSIG	10 PSIG	15 PSIG	25 PSIG	50 PSIG	75 PSIG	100 PSIG	125 PSIG	150 PSIG	200 PSIG	250 PSIG
1/32"	0.03125"	0.40	0.47	0.58	0.70	0.94	1.53	2.12	2.72	3.31	3.90	5.08	6.27
1/16"	0.0625"	1.58	1.86	2.34	2.81	3.76	6.13	8.49	10.86	13.23	15.59	20.33	25.06
3/32"	0.09375"	3.56	4.20	5.26	6.33	8.46	13.78	19.11	24.44	29.76	35.09	45.74	56.39
1/8"	0.125"	6.32	7.46	9.35	11.25	15.03	24.50	33.97	43.44	52.91	62.38	81.32	100.25
5/32"	0.15625"	9.88	11.66	14.62	17.57	23.49	38.29	53.08	67.88	82.67	97.47	127.06	156.65
3/16"	0.1875"	14.23	16.78	21.05	25.31	33.83	55.13	76.44	97.74	119.05	140.35	192.96	225.57
7/32"	0.21875"	19.37	22.85	28.65	34.45	46.04	75.04	104.04	133.04	162.04	191.03	249.03	307.03
1/4"	0.250"	25.29	29.84	37.41	44.99	60.14	98.01	135.89	173.76	211.64	249.51	325.56	401.01
9/32"	0.28125"	32.01	37.77	47.35	56.94	76.11	124.05	171.99	219.92	267.86	315.79	411.66	507.53
5/16"	0.3125"	39.52	46.62	58.46	70.30	93.07	153.15	212.33	271.51	330.09	389.87	508.23	626.59
11/32"	0.34375"	47.82	56.42	70.74	85.06	113.70	185.31	256.92	328.52	400.13	471.74	614.95	758.17
3/8"	0.375"	56.91	67.14	84.18	101.23	135.31	220.53	305.75	390.97	476.19	561.41	731.84	902.28
13/32"	0.40625"	66.79	78.79	98.80	118.80	158.81	258.82	358.83	458.85	558.86	658.87	858.90	1,058.90
7/16"	0.4375"	77.46	91.38	114.58	137.78	184.18	300.17	416.16	532.15	648.15	764.14	996.12	1,228.10
15/32"	0.46875"	88.93	104.90	131.54	158.17	211.43	344.58	477.74	610.89	744.04	877.20	1,143.50	1,409.80
1/2"	0.500"	101.18	119.36	149.66	179.96	240.56	392.06	543.56	695.06	846.56	998.06	1,301.00	1,604.00