

Steam Tables

Definitions

Saturated Steam is a pure steam at the temperature that corresponds to the boiling temperature of water at the existing pressure.

Gauge Pressure is pressure in pounds per square inch above atmospheric pressure, which is 14.7 pounds per square inch absolute. Gauge pressure (psig) plus 14.7 equals absolute pressure. Or, absolute pressure minus 14.7 equals gauge pressure.

Pressure/Temperature Relationship For every pressure of pure steam there is a corresponding temperature. Example: The temperature of 250 psig pure steam is always 406°F.

Heat of Saturated Liquid This is the amount of heat required to raise the temperature of a pound of water from 32°F to the boiling point at the pressure and temperature shown. It is expressed in British thermal units (Btu).

Latent Heat or Heat of Vaporization The amount of heat (expressed in Btu) required to change a pound of boiling water to a pound of steam. This same amount of heat is released when a pound of steam is condensed back into a pound of water. This heat quantity is different for every pressure/ temperature combination, as shown in the steam table.

Total Heat of Steam The sum of the Heat of the Liquid and Latent Heat in Btu. It is the total heat in steam above 32°F.

How the Table is Used

In addition to determining pressure/ temperature relationships, you can compute the amount of steam that will be condensed by any heating unit of known Btu output. Conversely, the table can be used to determine Btu output if steam condensing rate is known. In the application portion of this section, there are several references to the use of the steam table.

Properties of Saturated Steam					
(Abstracted from Keenan and Keyes, THERMODYNAMIC					
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	Gauge Pressure	Steam Temp. (F °)	Heat of Sat. Liquid (Btu/lb)	Latent Heat (Btu/lb)	Total Heat of Steam (Btu/lb)
Inches of Vacuum	29.743	32.00	0.00	1075.8	1075.8
	29.515	53.14	21.21	1063.8	1085.0
	27.886	101.74	69.70	1036.3	1106.0
	19.742	162.24	130.13	1001.0	1131.0
	9.562	193.21	161.17	982.1	1143.3
	7.536	197.75	165.73	979.3	1145.0
	5.490	201.96	169.96	976.6	1146.6
	3.454	205.88	173.91	974.2	1148.1
	1.418	209.56	177.61	971.9	1149.5
	PSIG	0.0	212.00	180.07	970.3
1.3		216.32	184.42	967.6	1152.0
2.3		219.44	187.56	965.5	1153.1
5.3		227.96	196.16	960.1	1156.3
10.3		240.07	208.42	952.1	1160.6
15.3		250.33	218.82	945.3	1164.1
20.3		259.28	227.91	939.2	1167.1
25.3		267.25	236.03	933.7	1169.7
30.3		274.44	243.36	928.6	1172.0
40.3		287.07	256.30	919.6	1175.9
50.3		297.97	267.50	911.6	1179.1
60.3		307.60	277.43	904.5	1181.9
70.3		316.25	286.39	897.8	1184.2
80.3		324.12	294.56	891.7	1186.2
90.3		331.36	302.10	886.0	1188.1
100.0		337.90	308.80	880.0	1188.8
110.3		344.33	315.68	875.4	1191.1
120.3		350.21	321.85	870.6	1192.4
125.3		353.02	324.82	868.2	1193.0
130.3		355.76	327.70	865.8	1193.5
140.3		360.50	333.24	861.3	1194.6
150.3		365.99	338.53	857.1	1195.6
160.3		370.75	343.57	852.8	1196.5
180.3		379.67	353.10	844.9	1198.0
200.3		387.89	361.91	837.4	1199.3
225.3		397.37	372.12	828.5	1200.6
250.3		406.11	381.60	820.1	1201.7
		417.33	393.84	809.0	1202.8
		444.59	424.00	780.5	1204.5
		456.28	437.20	767.4	1204.6
	467.01	449.40	755.0	1204.4	
	486.21	471.60	731.6	1203.2	
	531.98	526.60	668.8	1195.4	
	567.22	571.70	611.7	1183.4	
	596.23	611.60	556.3	1167.9	
	613.15	636.30	519.6	1155.9	
	635.82	671.70	463.4	1135.1	
	668.13	730.60	360.5	1091.1	
	679.55	756.20	312.1	1068.3	
	705.40	902.70	0.0	902.7	

