

Steam Tables

[Including Mollier Chart]

(SI Units)

Complied By

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Steam Tables

The properties of dry saturated steam at different temperatures and pressures are given on pages 4-11, while the properties of superheated vapour are given on pages 12-19. All the numbers in the table refer to one kilogram of dry saturated or superheated vapours.

The notation and units employed in these tables are as follows:

Quantity	symbol	Unit
Temperature	T	°C
Pressure (absolute)	P	Bar (10^5 N/m ²)
Specific volume	v	m ³ /kg
Specific enthalpy	h	kJ/kg
Specific internal energy	u	kJ/kg
Specific entropy	s	kJ/kg.K
subscripts		
sat	Refer to saturation state	
f	Refer to saturation liquid state	
g	Refer to saturation vapour state	
fg	Refer to increment for evaporation	

In order to calculate the properties of wet steam of dryness fraction (x), the following equations are used:

$$\theta = (1 - x)\theta_f + x\theta_g \quad \text{or} \quad \theta = \theta_f + x\theta_{fg} \quad (\text{where } \theta \text{ is any property})$$

The specific volume of superheated steam (v) may be given by the following equation (Charles's law) assuming that superheated steam behaves as a perfect gas:

$$v = v_g \frac{T_{\text{sup}}}{T_{\text{sat}}} \quad [\text{Where } T \text{ is measured in K } T(K) = T(^{\circ}\text{C}) + 273.15]$$

The enthalpy (h) and entropy (s) of superheated steam are given by:

$$h = h_g + Cp(T_{\text{sup}} - T_{\text{sat}})$$

$$s = s_g + Cp \ln \frac{T_{\text{sup}}}{T_{\text{sat}}} \quad [\text{Where } T \text{ is measured in K}]$$

the entropy of wet vapour of dryness fraction (x) is given by:

$$s = s_f + \frac{x h_{fg}}{T_{\text{sat}}}$$

TABLE ONE
PROPERTIES OF SATURATED STEAM AND WATER
(TEMPERATURE BASE)

Sat. Temp. °C	Absolute pressure		Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Sat. Temp. °C
	P		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
	mm Hg	bar	m^3/kg		kJ/kg			kJ/kg			kJ/kg.K		
		($10^5 N/m^2$)	Liquid	Vapour	Liquid	Evaporation	Vapour	Liquid	Evaporation	Vapour	Liquid	Vapour	
0	4.58	0.00611	0.001000	206.160	0.0	2375.6	2375.6	0.0	2501.6	2501.6	0.000	9.158	0
1	4.92	0.00657	0.001000	192.610	4.2	2372.7	2376.9	4.2	2499.2	2503.4	0.015	9.131	1
2	5.29	0.00706	0.001000	179.920	8.4	2369.8	2378.2	8.4	2496.8	2505.2	0.031	9.105	2
3	5.68	0.00758	0.001000	168.170	12.6	2367.0	2379.6	12.6	2494.5	2507.1	0.046	9.079	3
4	6.10	0.00813	0.001000	157.270	16.8	2364.2	2381.0	16.8	2492.1	2508.9	0.061	9.053	4
5	6.54	0.00872	0.001000	147.160	21.0	2361.4	2382.4	21.0	2489.7	2510.7	0.076	9.027	5
6	7.01	0.00935	0.001000	137.780	25.2	2358.6	2383.8	25.2	2487.4	2512.6	0.091	9.001	6
7	7.51	0.01001	0.001000	129.060	29.4	2355.8	2385.2	29.4	2485.0	2514.4	0.106	8.976	7
8	8.04	0.01072	0.001000	120.970	33.6	2352.9	2386.5	33.6	2482.6	2516.2	0.121	8.951	8
9	8.60	0.01147	0.001000	113.440	37.8	2350.2	2388.0	37.8	2480.3	2518.1	0.136	8.926	9
10	9.20	0.01227	0.001000	106.430	42.0	2347.3	2389.3	42.0	2477.9	2519.9	0.151	8.902	10
11	9.84	0.01312	0.001000	99.909	46.2	2344.4	2390.6	46.2	2475.5	2521.7	0.166	8.878	11
12	10.20	0.01401	0.001000	93.835	50.4	2341.7	2392.1	50.4	2473.2	2523.6	0.181	8.854	12
13	11.21	0.01497	0.001000	88.176	54.6	2338.8	2393.4	54.6	2470.8	2525.4	0.195	8.830	13
14	11.96	0.01597	0.001000	82.900	58.8	2336.0	2394.8	58.8	2468.5	2527.2	0.210	8.806	14
15	12.79	0.01704	0.001000	77.978	62.9	2333.3	2396.2	62.9	2466.1	2529.1	0.224	8.782	15
16	13.64	0.01817	0.001001	73.384	67.1	2330.5	2397.6	67.1	2463.8	2530.9	0.239	8.759	16
17	14.50	0.01936	0.001001	69.095	71.3	2327.6	2398.9	71.3	2461.4	2532.7	0.253	8.736	17
18	15.50	0.02062	0.001001	65.087	75.5	2324.8	2400.3	75.5	2459.0	2534.5	0.268	8.714	18
19	16.50	0.02196	0.001001	61.341	79.7	2322.0	2401.7	79.7	2456.7	2536.4	0.282	8.691	19
20	17.50	0.02337	0.001002	57.838	83.9	2319.1	2403.0	83.9	2454.3	2538.2	0.296	8.668	20
21	18.65	0.02485	0.001002	54.561	88.0	2316.4	2404.4	88.0	2452.0	2540.0	0.310	8.646	21
22	19.80	0.02642	0.001002	51.492	92.2	2313.6	2405.8	92.2	2449.6	2541.8	0.325	8.624	22
23	21.10	0.02808	0.001002	48.619	96.4	2310.7	2407.1	96.4	2447.2	2543.6	0.339	8.692	23
24	22.40	0.02982	0.001003	45.926	100.6	2308.0	2408.5	100.6	2444.9	2545.5	0.353	8.581	24
25	23.80	0.03166	0.001003	43.402	104.8	2305.1	2409.9	104.8	2442.5	2547.3	0.367	8.559	25
26	25.20	0.03360	0.001003	41.034	108.9	2302.3	2411.2	108.9	2440.2	2549.1	0.381	8.538	26
27	26.70	0.03564	0.001003	38.813	113.1	2299.5	2412.6	113.1	2437.8	2550.9	0.395	8.517	27
28	28.35	0.03778	0.001004	36.728	117.3	2296.6	2413.9	117.3	2435.4	2552.7	0.409	8.496	28
29	30.05	0.04004	0.001004	34.769	121.5	2293.8	2415.3	121.5	2433.1	2554.5	0.423	8.475	29
30	31.80	0.04242	0.001004	32.929	125.7	2291.0	2416.7	125.7	2430.7	2556.4	0.437	8.455	30
31	33.70	0.04491	0.001005	31.199	129.8	2288.3	2418.1	129.8	2428.3	2558.2	0.450	8.434	31
32	35.70	0.04753	0.001005	29.572	134.0	2285.4	2419.4	134.0	2425.9	2560.0	0.464	8.414	32
33	37.70	0.05029	0.001005	28.042	138.2	2282.6	2420.8	138.2	2423.6	2561.8	0.478	8.394	33
34	39.90	0.05318	0.001006	26.601	142.4	2279.7	2422.1	142.4	2421.2	2563.6	0.491	8.374	34
35	42.20	0.05622	0.001006	25.245	146.6	2276.9	2423.5	146.6	2418.8	2565.4	0.505	8.354	35
36	44.60	0.05940	0.001006	23.967	150.7	2274.1	2424.8	150.7	2416.4	2567.2	0.518	8.335	36
37	47.10	0.06274	0.001007	22.763	154.9	2271.3	2426.2	154.9	2414.1	2569.0	0.532	8.315	37
38	49.70	0.06624	0.001007	21.627	159.1	2268.4	2427.5	159.1	2411.7	2570.8	0.545	8.296	38
39	52.50	0.06991	0.001007	20.557	163.3	2265.6	2428.9	163.3	2409.3	2572.6	0.559	8.277	39
40	55.30	0.07375	0.001008	19.546	167.5	2262.8	2430.2	167.5	2406.9	2574.4	0.572	8.258	40
41	58.4	0.07777	0.001008	18.5920	171.6	2260.0	2431.6	171.6	2404.6	2576.2	0.585	8.239	41
42	61.5	0.08199	0.001009	17.6920	175.8	2257.1	2432.8	175.8	2402.1	2577.9	0.599	8.221	42
43	61.8	0.08639	0.001009	16.8410	180.0	2254.2	2434.2	180.0	2399.7	2579.7	0.612	8.203	43
44	68.3	0.09100	0.001009	16.0360	184.2	2251.4	2435.6	184.2	2397.3	2581.5	0.625	8.184	44
45	71.9	0.09582	0.001010	15.2760	188.4	2248.5	2436.9	188.4	2394.9	2583.3	0.638	8.166	45

TABLE ONE (continue)
PROPERTIES OF SATURATED STEAM AND WATER
(TEMPERATURE BASE)

Sat. Temp. °C	Absolute pressure		Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Sat. Temp. °C
	P		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
mm Hg	bar (10^5N/m^2)	m^3/kg		kJ/kg			kJ/kg			kJ/kg.K			
			Liquid	Vapour	Liquid	Evaporation	Vapour	Liquid	Evaporation	Vapour	Liquid	Vapour	
46	75.7	0.10090	0.001010	14.5570	192.5	2245.7	2438.2	192.5	2392.6	2585.1	0.651	8.148	46
47	79.6	0.10610	0.001011	13.8770	196.7	2243.0	2439.7	196.7	2390.2	2586.9	0.664	8.130	47
48	83.7	0.11160	0.001011	13.2330	200.9	2240.0	2440.9	200.9	2387.7	2588.6	0.678	8.113	48
49	88.0	0.11740	0.001012	12.6230	205.1	2237.1	2442.2	205.1	2385.3	2590.4	0.691	8.095	49
50	92.5	0.12340	0.001012	12.0460	209.3	2234.3	2443.6	209.3	2382.9	2592.2	0.704	8.078	50
51	97.5	0.12960	0.001013	11.4990	213.4	2231.5	2444.9	213.4	2380.5	2593.9	0.716	8.060	51
52	102.1	0.13610	0.001013	10.8900	217.6	2229.9	2447.5	217.6	2378.1	2595.7	0.729	8.043	52
53	107.2	0.14290	0.001014	10.4880	221.8	2225.8	2447.6	221.8	2375.7	2597.5	0.742	8.026	53
54	112.5	0.15000	0.001014	10.0220	226.0	2222.9	2448.9	226.0	2373.2	2599.2	0.755	8.009	54
55	118.1	0.15740	0.001015	9.5789	230.2	2220.8	2451.0	230.2	2371.6	2601.8	0.768	7.993	55
56	123.8	0.16510	0.001015	9.1587	234.4	2217.1	2451.5	234.4	2368.3	2602.7	0.780	7.976	56
57	129.9	0.17310	0.001016	8.7598	238.5	2214.4	2452.9	238.5	2366.0	2604.5	0.793	7.959	57
58	136.1	0.18150	0.001016	8.3808	242.7	2211.4	2454.1	242.7	2363.5	2606.2	0.806	7.943	58
59	142.6	0.19020	0.001017	8.0208	246.9	2208.6	2455.4	246.9	2361.1	2608.0	0.818	7.927	59
60	149.4	0.19920	0.001017	7.6785	251.1	2205.7	2456.7	251.1	2358.6	2609.7	0.831	7.911	60
61	156.5	0.20860	0.001018	7.3532	255.3	2202.7	2458.0	255.3	2356.1	2611.4	0.844	7.895	61
62	163.8	0.21840	0.001018	7.0437	259.5	2199.9	2459.4	259.5	2353.7	2613.2	0.856	7.879	62
63	171.4	0.22860	0.001019	6.7493	263.6	2197.0	2460.6	263.6	2351.3	2614.9	0.868	7.863	63
64	179.3	0.23910	0.001019	6.4690	267.8	2194.2	2461.9	267.8	2348.8	2616.6	0.881	7.848	64
65	187.6	0.25010	0.001020	6.2023	272.0	2191.3	2463.3	272.0	2346.4	2618.4	0.893	7.832	65
66	196.1	0.26150	0.001020	5.9482	276.2	2188.4	2464.6	276.2	2343.9	2620.1	0.906	7.817	66
67	205.0	0.27330	0.001021	5.7062	280.4	2185.5	2465.8	280.4	2341.4	2621.8	0.918	7.802	67
68	214.2	0.28560	0.001022	5.4756	284.6	2182.5	2467.1	284.6	2338.9	2623.5	0.930	7.786	68
69	223.8	0.29840	0.001022	5.2558	288.8	2179.6	2468.4	288.8	2336.4	2625.2	0.943	7.771	69
70	233.7	0.31160	0.001023	5.0463	293.0	2176.7	2469.7	293.0	2334.0	2626.9	0.955	7.757	70
71	244.1	0.32540	0.001024	4.8464	297.2	2173.7	2470.9	297.2	2331.4	2628.6	0.967	7.742	71
72	254.7	0.33960	0.001024	4.6557	301.4	2170.8	2472.2	301.4	2329.0	2630.3	0.979	7.727	72
73	265.8	0.35430	0.001025	4.4737	305.5	2168.0	2473.5	305.5	2326.5	2632.0	0.991	7.712	73
74	277.2	0.36960	0.001025	4.3000	309.7	2165.1	2474.8	309.7	2324.0	2633.7	1.003	7.698	74
75	289.1	0.38550	0.001026	4.1341	313.9	2162.2	2476.0	313.9	2321.5	2635.4	1.015	7.683	75
76	301.4	0.40190	0.001027	3.9757	318.1	2159.3	2477.3	318.1	2319.0	2637.1	1.027	7.669	76
77	314.2	0.41890	0.001027	3.8243	322.3	2156.2	2478.5	322.3	2316.4	2638.7	1.039	7.655	77
78	327.4	0.43650	0.001028	3.6796	326.5	2153.3	2479.8	326.5	2313.9	2640.4	1.051	7.641	78
79	341.1	0.45470	0.001029	3.5413	330.7	2150.4	2481.1	330.7	2311.4	2642.1	1.063	7.627	79
80	355.2	0.47360	0.001029	3.4091	334.9	2147.5	2482.3	334.9	2308.9	2643.8	1.075	7.613	80
81	369.8	0.49310	0.001030	3.2826	339.0	2144.5	2483.5	339.1	2306.3	2645.4	1.087	7.599	81
82	385.0	0.51330	0.001031	3.1616	343.2	2141.6	2484.8	343.3	2303.8	2647.1	1.099	7.586	82
83	400.7	0.53420	0.001031	3.0458	347.4	2138.5	2486.0	347.5	2301.2	2648.7	1.111	7.572	83
84	416.8	0.55570	0.001032	2.9350	351.6	2135.7	2487.3	351.7	2298.6	2650.4	1.123	7.559	84
85	433.5	0.57800	0.001033	2.8288	355.8	2132.7	2488.5	355.9	2296.1	2652.0	1.134	7.545	85
86	450.8	0.6011	0.001033	2.72720	360.0	2129.6	2489.7	360.1	2293.5	2653.6	1.146	7.532	86
87	468.7	0.6249	0.001034	2.62980	364.2	2126.7	2491.0	364.3	2290.9	2655.3	1.158	7.519	87
88	487.2	0.6495	0.001035	2.53650	368.4	2123.7	2492.2	368.5	2288.4	2656.9	1.169	7.506	88
89	506.2	0.6749	0.001035	2.44700	372.6	2120.7	2493.4	372.7	2285.8	2658.5	1.181	7.493	89
90	525.9	0.7011	0.001036	2.36130	376.8	2117.7	2494.5	376.9	2283.2	2660.1	1.193	7.480	90

TABLE ONE (continue)
PROPERTIES OF SATURATED STEAM AND WATER
(TEMPERATURE BASE)

Sat. Temp. °C	Absolute pressure		Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Sat. Temp. °C
	P		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
	mm Hg	bar (10^5N/m^2)	m^3/kg		kJ/kg			kJ/kg			kJ/kg.K		
			Liquid	Vapour	Liquid	Evaporation	Vapour	Liquid	Evaporation	Vapour	Liquid	Vapour	
91	546.2	0.7282	0.001037	2.2791	381.0	2114.7	2495.7	381.1	2280.6	2661.7	1.204	7.467	91
92	567.1	0.7561	0.001038	2.2002	385.3	2111.7	2497.0	385.4	2278.0	2663.4	1.216	7.454	92
93	588.7	0.7849	0.001038	2.1245	389.5	2108.7	2498.2	389.6	2275.4	2665.0	1.227	7.442	93
94	611.0	0.8146	0.001039	2.0519	393.7	2105.7	2499.5	393.8	2272.8	2666.6	1.239	7.429	94
95	634.0	0.8453	0.001040	1.9822	397.9	2102.6	2500.5	398.0	2272.2	2668.1	1.250	7.417	95
96	657.7	0.87690	0.001041	1.9153	402.1	2099.6	2501.7	402.2	2267.5	2669.7	1.261	7.404	96
97	682.2	0.90940	0.001041	1.8510	406.3	2096.7	2503.0	406.4	2264.9	2671.3	1.273	7.392	97
98	707.3	0.94300	0.001042	1.7893	410.5	2093.7	2504.2	410.6	2262.2	2672.9	1.284	7.380	98
99	733.3	0.97760	0.001043	1.7300	414.7	2090.6	2505.3	414.8	2259.6	2674.4	1.296	7.368	99
100	760.0	1.01325	0.001044	1.6730	419.0	2087.5	2506.5	419.1	2256.9	2676.0	1.307	7.355	100
102		1.0880	0.001045	1.5665	427.4	2081.3	2508.7	427.5	2251.6	2679.1	1.329	7.331	102
104		1.1670	0.001047	1.4662	435.8	2075.3	2511.1	435.9	2246.3	2682.2	1.352	7.308	104
106		1.2500	0.001048	1.3742	444.3	2069.3	2513.5	444.4	2240.9	2685.3	1.374	7.284	106
108		1.3390	0.001050	1.2889	452.8	2063.0	2515.7	452.9	2235.4	2688.3	1.396	7.261	108
110		1.4330	0.001052	1.2099	461.1	2056.8	2517.9	461.3	2230.0	2691.3	1.419	7.239	110
112		1.5320	0.001054	1.1366	469.6	2050.5	2520.2	469.8	2224.5	2694.3	1.440	7.216	112
114		1.6360	0.001055	1.0685	478.1	2044.3	2522.4	478.3	2219.0	2697.2	1.462	7.194	114
116		1.7470	0.001057	1.0052	486.5	2038.1	2524.6	486.7	2213.4	2700.2	1.484	7.172	116
118		1.8630	0.001059	0.9463	495.0	2031.8	2526.8	495.2	2207.9	2703.1	1.506	7.151	118
120		1.9850	0.001061	0.8915	503.5	2025.5	2529.0	503.7	2202.2	2706.0	1.528	7.129	120
122		2.1150	0.001063	0.8405	512.0	2019.1	2531.0	512.2	2196.6	2708.8	1.549	7.108	122
124		2.2500	0.001064	0.7928	520.5	2012.8	2533.2	520.7	2190.9	2711.6	1.571	7.087	124
126		2.3930	0.001066	0.7484	528.9	2006.4	2535.3	529.2	2185.2	2714.4	1.592	7.067	126
128		2.5440	0.001068	0.7069	537.5	1999.8	2537.4	537.8	2179.4	2717.2	1.613	7.046	128
130		2.7010	0.001070	0.6681	546.0	1993.4	2539.4	546.3	2173.6	2719.9	1.634	7.026	130
132		2.8670	0.001072	0.6319	554.5	1986.9	2541.4	554.8	2167.8	2722.6	1.655	7.006	132
134		3.0410	0.001074	0.5980	563.1	1980.4	2543.5	563.4	2161.9	2725.3	1.676	6.986	134
136		3.2230	0.001076	0.5662	571.7	1973.8	2545.4	572.0	2155.9	2727.9	1.697	6.967	136
138		3.4140	0.001078	0.5364	580.1	1967.2	2547.4	580.5	2150.0	2730.5	1.718	6.947	138
140		3.6140	0.001080	0.5085	588.7	1960.6	2549.3	589.1	2144.0	2733.1	1.739	6.928	140
142		3.8230	0.001082	0.4823	597.3	1953.9	2551.2	597.7	2137.9	2735.6	1.760	6.910	142
144		4.0420	0.001084	0.4577	605.9	1947.2	2553.1	606.3	2131.8	2738.1	1.780	6.891	144
146		4.2710	0.001086	0.4346	614.4	1940.5	2555.0	614.9	2125.7	2740.6	1.801	6.872	146
148		4.5100	0.001089	0.4129	623.0	1933.8	2556.8	623.5	2119.5	2743.0	1.821	6.854	148
150		4.7600	0.001091	0.3925	631.6	1927.0	2558.6	632.1	2113.2	2745.4	1.842	6.836	150
155		5.4330	0.001096	0.3464	635.2	1927.8	2563.0	635.8	2097.4	2751.2	1.892	6.791	155
160		6.1810	0.001102	0.3068	674.8	1892.3	2567.1	675.5	2081.3	2756.7	1.943	6.748	160
165		7.0080	0.001108	0.2724	696.5	1874.6	2571.1	697.3	2064.8	2762.0	1.992	6.705	165
170		7.9200	0.001114	0.2426	718.2	1856.8	2575.0	719.1	2047.9	2767.1	2.042	6.663	170
175		8.924	0.001121	0.21654	740.1	1838.5	2578.6	741.1	2030.7	2771.8	2.091	6.622	175
180		10.027	0.001128	0.19380	762.0	1820.0	2582.0	763.1	2013.2	2776.3	2.139	6.582	180
185		11.233	0.001135	0.17386	784.0	1801.1	2585.1	785.3	1995.2	2780.4	2.188	6.542	185
190		12.551	0.001142	0.15632	806.1	1782.0	2588.1	807.5	1976.7	2784.3	2.236	6.504	190
195		13.987	0.001149	0.14084	828.3	1762.5	2590.8	829.9	1957.9	2787.8	2.283	6.465	195

TABLE ONE (continue)
PROPERTIES OF SATURATED STEAM AND WATER
(TEMPERATURE BASE)

Sat. Temp. °C	Absolute pressure		Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Sat. Temp. °C
	P		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
	mm Hg	bar	m^3/kg		kJ/kg			kJ/kg			kJ/kg.K		
		(10^5N/m^2)	Liquid	Vapour	Liquid	Evaporation	Vapour	Liquid	Evaporation	Vapour	Liquid	Vapour	
200		15.549	0.001156	0.1272	850.6	1742.6	2593.2	852.4	1938.6	2790.9	2.331	6.428	200
205		17.243	0.001164	0.1150	873.0	1722.5	2595.5	875.0	1918.8	2793.8	2.378	6.391	205
210		19.077	0.001172	0.1042	895.5	1701.9	2597.3	897.7	1898.5	2796.2	2.425	6.354	210
215		21.060	0.001181	0.0946	918.1	1680.9	2599.0	920.6	1877.6	2798.3	2.471	6.318	215
220		23.198	0.001190	0.0860	940.9	1659.4	2600.3	943.7	1856.2	2799.9	2.518	6.282	220
225		25.501	0.001199	0.0783	963.8	1637.6	2601.4	966.9	1834.3	2801.2	2.564	6.246	225
230		27.976	0.001209	0.0715	986.9	1615.2	2602.1	990.3	1811.7	2802.0	2.610	6.211	230
235		30.632	0.001219	0.0652	1010.1	1592.4	2602.4	1013.8	1788.5	2802.3	2.656	6.176	235
240		33.478	0.001229	0.0597	1033.5	1569.0	2602.5	1037.6	1764.6	2802.2	2.702	6.141	240
245		36.523	0.001240	0.0546	1057.1	1545.1	2602.2	1061.6	1740.6	2801.6	2.747	6.106	245
250		39.776	0.001251	0.0500	1080.8	1520.5	2601.4	1085.8	1714.7	2800.4	2.794	6.071	250
255		43.246	0.001263	0.0459	1104.7	1495.5	2600.2	1110.2	1688.5	2798.7	2.839	6.036	255
260		46.943	0.001276	0.0421	1128.9	1469.7	2598.6	1134.9	1661.5	2796.4	2.885	6.001	260
265		50.877	0.001289	0.0387	1153.3	1443.2	2596.6	1159.9	1633.5	2793.5	2.931	5.966	265
270		55.058	0.001303	0.0356	1178.0	1415.9	2594.0	1185.2	1604.6	2789.9	2.976	5.930	270
275		59.496	0.001317	0.0327	1203.1	1387.7	2590.7	1210.9	1574.7	2785.5	3.022	5.895	275
280		64.202	0.001332	0.0301	1228.2	1358.7	2587.0	1236.8	1543.6	2780.4	3.068	5.859	280
285		69.186	0.001349	0.0277	1253.9	1328.8	2582.6	1263.2	1511.3	2774.5	3.115	5.822	285
290		74.461	0.001366	0.0255	1279.8	1297.6	2577.5	1290.0	1477.6	2767.6	3.161	5.785	290
295		80.037	0.001384	0.0235	1306.2	1265.4	2571.6	1317.3	1442.6	2759.8	3.208	5.747	295
300		85.927	0.001404	0.0216	1333.0	1231.9	2565.0	1345.1	1406.0	2751.0	3.255	5.708	300
305		92.144	0.001425	0.0199	1360.3	1197.2	2557.5	1373.4	1367.7	2741.1	3.303	5.669	305
310		98.700	0.001448	0.0183	1388.1	1160.9	2549.0	1402.4	1327.6	2730.0	3.351	5.628	310
315		105.610	0.001473	0.0169	1416.5	1123.0	2539.6	1432.1	1285.5	2717.6	3.400	5.586	315
320		112.890	0.001500	0.0155	1445.7	1083.3	2528.9	1462.6	1241.1	2703.7	3.450	5.542	320
325		120.56	0.001529	0.0142	1475.6	1041.3	2516.9	1494.0	1194.0	2688.0	3.501	5.497	325
330		128.63	0.001562	0.0130	1506.4	996.7	2503.1	1526.5	1143.6	2670.2	3.553	5.449	330
335		137.12	0.001598	0.0119	1538.4	948.8	2487.2	1560.3	1089.5	2649.7	3.606	5.398	335
340		146.05	0.001639	0.0108	1571.6	897.2	2468.8	1595.5	1030.7	2626.2	3.662	5.343	340
345		155.45	0.001686	0.0098	1606.3	840.8	2447.1	1632.5	966.4	2598.9	3.719	5.283	345
350		165.35	0.001741	0.0088	1643.1	779.1	2422.2	1671.9	895.7	2567.7	3.780	5.218	350
255		175.77	0.001809	0.0079	1684.8	707.5	2392.3	1716.6	813.8	2530.4	3.849	5.144	255
360		186.75	0.001896	0.0069	1728.8	627.0	2355.8	1764.2	721.3	2485.4	3.921	5.060	360
365		198.33	0.002016	0.0060	1778.0	530.7	2308.8	1818.0	610.0	2428.0	4.002	4.968	365
370		210.54	0.002214	0.0050	1843.6	394.5	2238.1	1890.2	452.6	2342.8	4.111	4.814	370
	Critical Point												
374.15		221.20000	0.003170	0.0032	2037.3	0.0	2037.3	2107.4	0.0	2107.4	4.443	4.443	374.15

TABLE TWO
PROPERTIES OF SATURATED STEAM AND WATER
(PRESSURE BASE)

Absolute pressure bar (10 ⁵ N/m ²)	Sat. Temp. °C	Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Absolute pressure bar (10 ⁵ N/m ²)
		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
		m ³ /kg Liquid	m ³ /kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg K Liquid	kJ/kg K Vapour	
0.006113	0.01	0.001000	206.1550	0.0	2375.7	2375.7	0.00071	2501.73	2501.73	0.000	9.1578	triple point
0.010	7.00	0.001000	129.2100	29.3	2355.9	2385.2	29.3	2485.0	2514.4	0.106	8.974	0.010
0.015	13.00	0.001000	88.3510	54.6	2338.3	2392.9	54.6	2470.8	2525.4	0.196	8.827	0.015
0.020	17.50	0.001001	67.0120	73.5	2326.1	2399.6	73.5	2460.2	2533.6	0.261	8.723	0.020
0.025	21.10	0.001002	54.3400	88.4	2316.0	2404.4	88.4	2451.8	2540.2	0.312	8.642	0.025
0.030	24.10	0.001003	45.6700	101.0	2307.6	2408.6	101.0	2444.6	2545.6	0.354	8.576	0.030
0.035	26.70	0.001003	39.5100	111.8	2300.3	2412.1	111.8	2438.6	2550.4	0.391	8.521	0.035
0.040	29.00	0.001004	34.8000	121.4	2293.9	2415.3	121.4	2433.1	2554.5	0.422	8.473	0.040
0.045	31.00	0.001005	31.1600	130.0	2288.0	2418.0	130.0	2428.2	2558.2	0.451	8.431	0.045
0.050	32.90	0.001005	28.2000	138.0	2282.6	2420.6	138.0	2423.6	2561.6	0.476	8.394	0.050
0.060	36.20	0.001006	23.7400	151.5	2273.6	2425.1	151.5	2416.0	2567.5	0.521	8.329	0.060
0.070	39.00	0.001007	20.5300	163.4	2265.5	2428.9	163.4	2409.2	2572.6	0.559	8.274	0.070
0.080	41.50	0.001008	18.1000	174.0	2258.3	2432.3	174.0	2403.2	2577.1	0.593	8.227	0.080
0.090	43.80	0.001009	16.2000	183.3	2251.0	2434.3	183.3	2397.0	2580.1	0.622	8.186	0.090
0.100	45.80	0.001010	14.6700	192.0	2246.0	2438.0	192.0	2392.7	2584.7	0.649	8.149	0.100
0.120	49.40	0.001011	12.3600	207.0	2234.7	2441.7	207.0	2383.0	2590.0	0.696	8.085	0.120
0.140	52.60	0.001013	10.6900	220.0	2227.1	2447.0	220.0	2376.7	2596.7	0.737	8.061	0.140
0.160	55.30	0.001015	9.4320	232.0	2218.1	2450.1	232.0	2369.0	2601.0	0.772	7.985	0.160
0.180	57.80	0.001016	8.4450	242.0	2211.9	2453.9	242.0	2363.9	2605.9	0.804	7.944	0.180
0.200	60.10	0.001017	7.6490	251.5	2205.4	2456.9	251.5	2358.4	2609.9	0.832	7.907	0.200
0.220	62.20	0.001018	6.9950	260.1	2199.4	2459.5	260.1	2353.3	2613.4	0.858	7.874	0.220
0.240	64.10	0.001019	6.4460	268.2	2193.9	2462.1	268.2	2348.6	2616.8	0.882	7.844	0.240
0.260	65.90	0.001020	5.9800	276.0	2188.3	2464.3	276.0	2343.8	2619.8	0.904	7.817	0.260
0.280	67.60	0.001021	5.5780	283.0	2183.5	2466.5	283.0	2339.7	2622.7	0.925	7.791	0.280
0.300	69.10	0.001022	5.2290	289.3	2179.3	2468.5	289.3	2336.1	2625.4	0.944	7.767	0.300
0.320	70.60	0.001023	4.9220	295.6	2174.8	2470.4	295.6	2332.3	2627.9	0.962	7.745	0.320
0.340	72.60	0.001024	4.6500	302.0	2170.3	2472.3	302.0	2328.4	2630.4	0.980	7.725	0.340
0.360	73.40	0.001025	4.4080	307.1	2166.8	2473.9	307.1	2325.5	2632.6	0.996	7.705	0.360
0.380	74.70	0.001026	4.1900	312.5	2163.1	2475.6	312.5	2322.3	2634.8	1.011	7.686	0.380
0.400	75.90	0.001027	3.9930	318.0	2159.1	2477.1	318.0	2318.8	2636.8	1.026	7.669	0.400
0.420	77.10	0.001027	3.8150	323.0	2154.8	2477.8	323.0	2315.0	2638.0	1.040	7.652	0.420
0.440	78.20	0.001028	3.6520	327.3	2152.8	2480.0	327.3	2313.4	2640.7	1.054	7.636	0.440
0.460	79.30	0.001029	3.5030	332.0	2149.5	2481.5	332.0	2310.6	2642.6	1.067	7.621	0.460
0.480	80.30	0.001029	3.3660	336.3	2146.5	2482.7	336.3	2308.0	2644.3	1.079	7.607	0.480
0.500	81.31	0.001030	3.24827	340.3	2142.5	2482.9	340.4	2304.9	2645.3	1.089	7.597	0.500
0.550	83.71	0.001031	2.97032	350.3	2136.3	2486.6	350.4	2299.5	2650.0	1.119	7.561	0.550
0.600	85.92	0.001033	2.73640	359.7	2129.8	2489.5	359.8	2293.8	2653.7	1.145	7.533	0.600
0.650	87.98	0.001034	2.53930	368.4	2123.4	2491.8	368.5	2288.4	2656.9	1.169	7.506	0.650
0.700	89.93	0.001036	2.36795	376.5	2117.8	2494.3	376.6	2283.4	2660.1	1.191	7.480	0.700
0.750	91.75	0.001037	2.22017	384.2	2112.4	2496.6	384.3	2278.7	2663.1	1.212	7.457	0.750
0.800	93.48	0.001038	2.08964	391.5	2107.1	2498.6	391.6	2274.1	2665.8	1.232	7.439	0.800
0.850	95.12	0.001039	1.97438	398.4	2102.7	2501.1	398.5	2269.4	2668.9	1.251	7.415	0.850
0.900	96.68	0.001041	1.87135	405.0	2097.5	2502.5	405.1	2265.8	2670.9	1.269	7.396	0.900
0.950	98.18	0.001042	1.77869	411.3	2092.9	2504.2	411.4	2261.8	2673.2	1.286	7.377	0.950
1.000	99.61	0.001043	1.69491	417.3	2088.6	2505.9	417.4	2258.0	2675.4	1.302	7.360	1.000
1.0135	100.00	0.001044	1.67295	418.9	2087.7	2506.5	419.0	2257.0	2676.1	1.306	7.355	1.0135

TABLE TWO (continue)
PROPERTIES OF SATURATED STEAM AND WATER
(PRESSURE BASE)

Absolute pressure bar (10 ⁵ N/m ²)	Sat. Temp. °C	Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Absolute pressure bar (10 ⁵ N/m ²)
		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
		m ³ /kg Liquid	m ³ /kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg K Liquid	kJ/kg K Vapour	
1.1	102.28	0.001045	1.551750	428.6	2080.4	2509.0	428.7	2250.9	2679.7	1.332	7.328	1.1
1.2	104.77	0.001047	1.430160	440.5	2072.8	2513.3	440.6	2244.2	2684.9	1.369	7.299	1.2
1.3	107.10	0.001049	1.326850	449.5	2064.9	2514.4	449.6	2237.8	2686.9	1.386	7.272	1.3
1.4	109.29	0.001051	1.237860	458.2	2058.9	2517.1	458.3	2232.0	2690.4	1.410	7.247	1.4
1.5	111.34	0.001052	1.160420	466.8	2052.5	2519.3	467.0	2226.3	2693.4	1.432	7.223	1.5
1.6	113.29	0.001054	1.092360	475.1	2046.4	2521.5	475.3	2221.0	2696.3	1.454	7.202	1.6
1.7	115.14	0.001056	1.032800	482.9	2040.4	2523.3	483.1	2215.8	2698.9	1.475	7.181	1.7
1.8	116.90	0.001057	0.978354	490.4	2035.0	2525.4	490.6	2210.9	2701.5	1.494	7.162	1.8
1.9	118.59	0.001059	0.929893	497.6	2029.7	2527.3	497.8	2206.2	2704.0	1.512	7.144	1.9
2.0	120.19	0.001060	0.887196	504.3	2024.6	2528.9	504.5	2201.8	2706.3	1.529	7.127	2.0
2.2	123.23	0.001063	0.811133	517.2	2014.8	2532.0	517.4	2193.0	2710.4	1.562	7.094	2.2
2.4	126.06	0.001066	0.747522	529.2	1906.0	2435.2	529.5	2185.1	2614.6	1.592	7.066	2.4
2.6	128.69	0.001068	0.693396	540.5	1997.5	2538.0	540.8	2177.5	2718.3	1.620	7.039	2.6
2.8	131.17	0.001070	0.646835	550.9	1989.5	2540.4	551.2	2170.2	2721.5	1.646	7.014	2.8
3.0	133.51	0.001073	0.606274	561.0	1981.8	2542.8	561.3	2163.3	2724.7	1.671	6.991	3.0
3.2	135.72	0.001075	0.570627	570.5	1974.6	2545.1	570.8	2156.9	2727.7	1.694	6.969	3.2
3.4	137.83	0.001077	0.539025	579.4	1967.7	2547.1	579.8	2150.5	2730.4	1.716	6.949	3.4
3.6	139.82	0.001079	0.501818	588.0	1964.2	2552.2	588.4	2144.5	2732.9	1.737	6.930	3.6
3.3	141.76	0.001081	0.485472	596.3	1978.9	2575.2	596.7	2138.7	2735.4	1.757	6.912	3.3
4.0	143.60	0.001083	0.462626	604.2	1948.5	2552.6	604.6	2133.0	2737.7	1.776	6.894	4.0
4.2	145.36	0.001085	0.441866	611.6	1942.5	2554.1	612.1	2127.6	2739.7	1.794	6.877	4.2
4.4	147.06	0.001087	0.422930	618.9	1936.8	2555.7	619.4	2122.3	2741.8	1.811	6.862	4.4
4.6	148.70	0.001088	0.405594	626.1	1931.3	2557.4	626.6	2117.4	2744.0	1.828	6.847	4.6
4.8	150.29	0.001091	0.389643	632.8	1925.9	2558.7	633.3	2112.4	2745.7	1.844	6.833	4.8
5.0	151.80	0.001092	0.375266	636.4	1923.4	2559.8	636.9	2107.5	2747.4	1.860	6.819	5.0
5.5	155.42	0.001097	0.342985	654.9	1908.1	2563.0	655.5	2096.1	2751.6	1.896	6.787	5.5
6.0	158.81	0.001101	0.315901	669.6	1896.3	2566.0	670.3	2085.2	2755.5	1.930	6.758	6.0
6.5	161.96	0.001105	0.292847	633.3	1935.2	2568.4	634.0	2074.8	2758.8	1.961	6.730	6.5
7.0	164.92	0.001108	0.273341	696.1	1874.5	2570.7	696.9	2065.0	2762.0	1.991	6.705	7.0
7.5	167.72	0.001111	0.255711	708.4	1864.6	2572.9	709.2	2055.4	2764.7	2.019	6.681	7.5
8.0	170.38	0.001115	0.240506	719.8	1855.1	2574.9	720.7	2046.6	2767.3	2.045	6.659	8.0
8.5	172.92	0.001118	0.227037	730.8	1846.0	2576.8	731.8	2038.0	2769.8	2.070	6.639	8.5
9.0	175.33	0.001121	0.215017	741.5	1837.2	2578.7	742.5	2029.7	2772.2	2.093	6.619	9.0
9.5	177.64	0.001124	0.204209	751.6	1828.7	2580.3	752.7	2021.5	2774.3	2.116	6.601	9.5
10.0	179.84	0.001127	0.194608	761.1	1820.4	2581.5	762.2	2013.8	2776.1	2.138	6.582	10.0
11.0	184.06	0.001133	0.177653	779.5	1804.6	2584.1	780.7	1998.7	2779.5	2.178	6.550	11.0
12.0	187.92	0.001138	0.163446	796.7	1789.7	2586.5	798.1	1984.5	2782.6	2.215	6.520	12.0
13.0	191.57	0.001143	0.151385	813.0	1775.6	2588.6	814.5	1970.9	2785.4	2.250	6.491	13.0
14.0	195.00	0.001149	0.140893	828.5	1762.2	2590.6	830.1	1957.8	2787.9	2.283	6.465	14.0
15.0	198.25	0.001152	0.131816	842.9	1749.2	2592.1	844.6	1945.2	2789.8	2.314	6.440	15.0
16.0	201.33	0.001158	0.123843	856.4	1737.1	2593.6	858.3	1933.4	2791.7	2.343	6.417	16.0
17.0	204.27	0.001163	0.116779	869.7	1725.4	2595.1	871.7	1921.9	2793.6	2.370	6.396	17.0
18.0	207.08	0.001167	0.110353	882.4	1713.8	2596.2	884.5	1910.3	2794.8	2.397	6.375	18.0
19.0	209.76	0.001171	0.104799	894.6	1702.4	2597.0	896.8	1899.3	2796.1	2.422	6.353	19.0
20.0	212.34	0.001176	0.099623	906.0	1692.0	2598.1	908.4	1888.9	2797.3	2.446	6.337	20.0

TABLE TWO (continue)
PROPERTIES OF SATURATED STEAM AND WATER
(PRESSURE BASE)

Absolute pressure bar (10 ⁵ N/m ²)	Sat. Temp. °C	Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Absolute pressure bar (10 ⁵ N/m ²)
		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
		m ³ /kg Liquid	m ³ /kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg K Liquid	kJ/kg K Vapour	
21.0	214.82	0.001180	0.094970	917.2	1681.6	2598.9	919.7	1878.6	2798.3	2.469	6.319	21.0
22.0	217.21	0.001184	0.090725	928.2	1671.4	2599.6	930.8	1868.4	2799.2	2.492	6.302	22.0
23.0	219.51	0.001188	0.086837	938.8	1661.3	2600.1	941.5	1858.3	2799.8	2.513	6.285	23.0
24.0	221.75	0.001192	0.083267	948.9	1651.7	2600.7	951.8	1848.7	2800.5	2.534	6.269	24.0
25.0	223.91	0.001196	0.079967	958.8	1642.2	2601.0	961.8	1839.1	2800.9	2.553	6.253	25.0
26.0	226.01	0.001201	0.076821	968.5	1633.1	2601.6	971.6	1829.7	2801.3	2.573	6.238	26.0
27.0	228.04	0.001205	0.074080	977.9	1623.7	2601.7	981.2	1820.5	2801.7	2.592	6.225	27.0
28.0	230.01	0.001209	0.071438	987.0	1615.2	2602.2	990.4	1811.8	2802.2	2.611	6.211	28.0
29.0	231.94	0.001212	0.068976	995.8	1606.5	2602.3	999.3	1803.0	2802.3	2.628	6.197	29.0
30.0	233.81	0.001216	0.066668	1004.7	1597.6	2602.3	1008.3	1794.0	2802.3	2.645	6.184	30.0
31.0	235.63	0.001220	0.064508	1013.2	1589.1	2602.3	1017.0	1785.3	2802.3	2.662	6.171	31.0
32.0	237.41	0.001224	0.062476	1021.4	1581.0	2602.4	1025.3	1777.0	2802.3	2.678	6.158	32.0
33.0	239.16	0.001227	0.060564	1029.4	1573.1	2602.4	1033.4	1768.9	2802.3	2.694	6.147	33.0
34.0	240.85	0.001230	0.058761	1037.3	1564.9	2602.2	1041.5	1760.5	2802.0	2.709	6.135	34.0
35.0	242.51	0.001234	0.057056	1045.3	1556.9	2602.2	1049.6	1752.3	2801.9	2.725	6.125	35.0
36.0	244.14	0.001237	0.055445	1052.9	1549.4	2602.3	1057.4	1744.5	2801.9	2.740	6.112	36.0
37.0	245.73	0.001240	0.053914	1060.5	1541.6	2602.1	1065.1	1736.5	2801.6	2.754	6.101	37.0
38.0	247.28	0.001245	0.052465	1067.8	1534.1	2601.8	1072.5	1728.7	2801.2	2.768	6.090	38.0
39.0	248.81	0.001249	0.051085	1075.2	1526.3	2601.6	1080.1	1720.7	2800.8	2.782	6.079	39.0
40.0	250.31	0.001252	0.049773	1082.4	1518.8	2601.2	1087.4	1712.9	2800.3	2.796	6.068	40.0
41.0	251.77	0.001255	0.048523	1089.2	1511.5	2600.7	1094.3	1705.6	2799.6	2.809	6.058	41.0
42.0	253.21	0.001258	0.047421	1096.2	1504.0	2600.2	1101.5	1697.9	2799.4	2.822	6.048	42.0
43.0	254.63	0.001261	0.046208	1103.0	1497.3	2600.3	1108.4	1690.6	2799.0	2.839	6.042	43.0
44.0	256.01	0.001265	0.045101	1109.6	1490.1	2599.8	1115.2	1683.0	2798.2	2.849	6.029	44.0
45.0	257.38	0.001269	0.044056	1116.4	1483.2	2599.5	1122.1	1675.7	2797.8	2.861	6.019	45.0
46.0	258.72	0.001272	0.043046	1123.0	1476.2	2599.3	1128.9	1668.4	2797.3	2.873	6.010	46.0
47.0	260.05	0.001275	0.042097	1129.3	1469.3	2598.6	1135.3	1661.2	2796.5	2.885	5.999	47.0
48.0	261.35	0.001278	0.041178	1135.6	1462.4	2597.9	1141.7	1653.9	2795.6	2.897	5.991	48.0
49.0	262.62	0.001281	0.040293	1141.8	1455.5	2597.4	1148.1	1646.7	2794.8	2.908	5.982	49.0
50.0	263.85	0.001285	0.039424	1147.9	1449.1	2597.0	1154.3	1639.8	2794.1	2.920	5.973	50.0
55.0	269.87	0.001302	0.035688	1177.5	1416.3	2593.8	1184.7	1605.4	2790.1	2.975	5.931	55.0
60.0	275.49	0.001318	0.032488	1205.5	1384.7	2590.2	1213.4	1571.7	2785.1	3.027	5.891	60.0
65.0	280.76	0.001334	0.029766	1232.1	1353.9	2586.0	1240.8	1538.7	2779.5	3.075	5.853	65.0
70.0	285.74	0.001350	0.027420	1257.7	1323.8	2581.5	1267.1	1506.3	2773.4	3.121	5.816	70.0
75.0	290.44	0.001368	0.025360	1282.2	1294.6	2576.8	1292.5	1474.5	2767.0	3.165	5.781	75.0
80.0	294.92	0.001384	0.023564	1305.8	1265.6	2571.4	1316.9	1443.0	2759.9	3.207	5.747	80.0
85.0	299.18	0.001401	0.022623	1328.7	1231.5	2560.2	1340.6	1411.9	2752.5	3.247	5.714	85.0
90.0	303.25	0.001417	0.020518	1350.7	1209.3	2560.0	1363.5	1381.2	2744.7	3.286	5.682	90.0
95.0	307.16	0.001434	0.019229	1372.3	1181.4	2553.7	1385.9	1350.5	2736.4	3.323	5.651	95.0
100.0	310.91	0.001451	0.018061	1393.5	1153.7	2547.2	1408.0	1319.8	2727.8	3.360	5.619	100.0
105.0	314.52	0.001470	0.016997	1414.0	1126.4	2540.3	1429.4	1289.4	2718.8	3.395	5.589	105.0
110.0	318.00	0.001488	0.016022	1433.9	1099.3	2533.3	1450.3	1259.2	2709.5	3.430	5.560	110.0
115.0	321.35	0.001506	0.015125	1453.9	1071.8	2525.7	1471.2	1228.4	2699.6	3.463	5.529	115.0
120.0	324.60	0.001524	0.014296	1473.4	1044.4	2517.8	1491.7	1197.7	2689.4	3.496	5.500	120.0
125.0	327.74	0.001544	0.013526	1492.5	1017.0	2509.5	1511.8	1166.8	2678.6	3.529	5.471	125.0

TABLE TWO (continue)
PROPERTIES OF SATURATED STEAM AND WATER
(*PRESSURE BASE*)

Absolute pressure bar (10 ⁵ N/m ²)	Sat. Temp. °C	Specific volume		Specific internal energy			Specific enthalpy			Specific entropy		Absolute pressure bar (10 ⁵ N/m ²)
		v_f	v_g	u_f	u_{fg}	u_g	h_f	h_{fg}	h_g	s_f	s_g	
		m ³ /kg Liquid	m ³ /kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg Liquid	kJ/kg Evaporation	kJ/kg Vapour	kJ/kg K Liquid	kJ/kg K Vapour	
130.0	330.78	0.001567	0.012808	1511.4	989.3	2500.7	1531.8	1135.4	2667.2	3.561	5.441	130.0
135.0	333.73	0.001587	0.012137	1530.3	961.2	2491.5	1551.7	1103.6	2655.3	3.592	5.411	135.0
140.0	336.60	0.001609	0.011505	1548.8	932.6	2481.3	1571.3	1071.1	2642.4	3.623	5.380	140.0
145.0	339.38	0.001633	0.010911	1567.5	903.5	2471.0	1591.2	1038.0	2629.2	3.654	5.349	145.0
150.0	342.09	0.001656	0.010349	1586.2	873.8	2460.0	1611.0	1004.2	2615.2	3.685	5.317	150.0
155.0	344.72	0.001683	0.009818	1604.5	843.7	2448.2	1630.6	969.8	2600.4	3.716	5.285	155.0
160.0	347.29	0.001704	0.009315	1623.0	813.0	2436.1	1650.3	934.8	2585.1	3.746	5.253	160.0
165.0	349.79	0.001738	0.008838	1641.5	781.7	2423.2	1670.2	898.8	2569.0	3.778	5.220	165.0
170.0	352.23	0.001769	0.008377	1661.2	748.6	2409.8	1691.3	860.9	2552.2	3.810	5.186	170.0
175.0	354.60	0.001802	0.007931	1681.6	716.3	2397.9	1713.1	823.6	2536.7	3.843	5.155	175.0
180.0	356.91	0.001839	0.007504	1701.5	677.6	2379.1	1734.6	779.6	2514.2	3.876	5.113	180.0
185.0	359.18	0.001880	0.007088	1721.4	640.8	2362.2	1756.2	737.1	2493.3	3.909	5.074	185.0
190.0	361.40	0.001926	0.006682	1742.0	601.8	2343.8	1778.6	692.2	2470.8	3.942	5.033	190.0
195.0	363.55	0.001977	0.006282	1762.9	560.6	2323.5	1801.5	644.5	2446.0	3.977	4.990	195.0
200.0	365.66	0.002037	0.005881	1785.5	515.3	2300.8	1826.2	592.2	2418.4	4.014	4.941	200.0
205.0	367.73	0.002108	0.005468	1810.5	463.8	2274.3	1853.7	532.7	2386.4	4.056	4.887	205.0
210.0	369.75	0.002202	0.005026	1840.1	401.9	2242.0	1886.3	461.2	2347.5	4.104	4.822	210.0
215.0	371.72	0.002342	0.004509	1879.4	319.0	2198.5	1929.8	365.6	2295.4	4.170	4.736	215.0
220.0	373.66	0.002739	0.003655	1963.3	139.0	2102.4	2023.6	159.2	2182.8	4.314	4.560	220.0
221.3	374.15	0.003170	0.003170	2037.2	0.0	2037.2	2107.3	0.0	2107.3	4.443	4.443	critical point

**TABLE THREE
PROPERTIES OF SUPERHEATED STEAM**

Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
		50	100	150	200	250	300	350		
0.1 (45.8)	v	14.87	17.37	19.72	22.05	24.39	26.73	29.06	v	0.1 (45.8)
	h	2592	2688	2782.9	2879.8	2977.3	3076.6	3177.5	h	
	s	8.173	8.452	8.692	8.908	9.104	9.285	9.454	s	
	u	2443.3	2514.3	2585.7	2659.3	2733.4	2809.3	2886.9	u	
0.2 (60.1)	v		8.644	9.817	10.98	12.14	13.31	14.47	v	0.2 (60.1)
	h		2685.5	2781.4	2878.5	2976.1	3075.8	3176.3	h	
	s		8.128	8.37	8.586	8.783	8.964	9.133	s	
	u		2512.6	2585.1	2658.9	2733.3	2809.6	2886.9	u	
0.3 (69.1)	v		5.745	6.528	7.306	8.082	8.858	9.633	v	0.3 (69.1)
	h		2685	2780.9	2878.9	2976.9	3076.2	3177.1	h	
	s		7.938	8.181	8.398	8.594	8.776	8.944	s	
	u		2512.7	2585.1	2659.7	2734.4	2810.5	2888.1	u	
0.4 (75.83)	v		4.297	4.886	5.47	6.053	6.635	7.216	v	0.4 (75.83)
	h		2684.2	2780.9	2878.5	2976.5	3076.1	3177	h	
	s		7.802	8.046	8.264	8.461	8.642	8.811	s	
	u		2512.3	2585.5	2659.7	2734.4	2810.7	2888.4	u	
0.5 (81.31)	v		3.431	3.906	4.373	4.841	5.306	5.771	v	0.5 (81.31)
	h		2682.9	2780.5	2878	2976.5	3075.8	3176.7	h	
	s		7.696	7.942	8.16	8.357	8.539	8.708	s	
	u		2511.4	2585.2	2659.4	2734.5	2810.5	2888.2	u	
0.6 (85.92)	v		2.852	3.248	3.762	4.028	4.415	4.802	v	0.6 (85.92)
	h		2681.6	2779.6	2877.2	2976.1	3075.7	3176.6	h	
	s		7.609	7.856	8.075	8.273	8.454	8.624	s	
	u		2510.5	2584.7	2651.5	2734.4	2810.8	2888.5	u	
0.7 (89.93)	v		2.441	2.78	3.116	3.452	3.782	4.114	v	0.7 (89.93)
	h		2680	2778.2	2876.8	2975.6	3075.3	3176.2	h	
	s		7.535	7.783	8.002	8.201	8.383	8.544	s	
	u		2509.1	2583.6	2658.7	2734.0	2810.6	2888.2	u	
0.8 (93.48)	v		2.131	2.43	2.725	3.033	3.308	3.598	v	0.8 (93.48)
	h		2678.7	2777.9	2876.4	2975.2	3074.9	3176.2	h	
	s		7.473	7.72	7.94	8.138	8.321	8.466	s	
	u		2508.2	2583.5	2658.4	2732.6	2810.3	2888.4	u	
0.9 (96.68)	v		1.889	2.159	2.422	2.682	2.941	3.2	v	0.9 (96.68)
	h		2677.5	2777.1	2875.9	2974.8	3074.9	3175.8	h	
	s		7.414	7.664	7.885	8.084	8.266	8.436	s	
	u		2507.5	2582.8	2657.9	2733.4	2810.2	2887.8	u	
1 (99.61)	v			1.956	2.195	2.432	2.667	2.001	v	1 (99.61)
	h			2776.6	2875.5	2974.8	3074.8	3175.8	h	
	s			7.616	7.838	8.037	8.219	8.389	s	
	u			2581	2656	2731.6	2808.1	2975.7	u	
2 (120.19)	v			0.966	1.088	1.207	1.325	1.442	v	2 (120.19)
	h			2768.5	2870.4	2971.4	3072.3	3174.1	h	
	s			7.281	7.503	7.711	7.896	8.066	s	
	u			2575.3	2652.8	2730	2807.3	2885.7	u	
3 (133.51)	v			0.637	0.72	0.801	0.881	0.958	v	3 (133.51)
	h			2760.4	2865.7	2967.9	3069.7	3171.9	h	
	s			7.078	7.316	7.519	7.705	7.876	s	
	u			2569.3	2649.7	2727.6	2805.4	2884.5	u	

TABLE THREE (continue)
PROPERTIES OF SUPERHEATED STEAM

Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
		400	450	500	550	600	650	700		
0.1 (45.8)	v h s u								v h s u	0.1 (45.8)
0.2 (60.1)	v h s u	15.64 3278.4 9.29 2965.6	16.8 3382.3 9.44 3046.3	17.96 3489 9.58 3129.8	19.12 3596.6 9.715 3214.2	20.29 3705.5 9.844 3299.7	21.45 3816.4 9.967 3387.4	22.61 3929 10.08 3476.8	v h s u	0.2 (60.1)
0.3 (69.1)	v h s u	10.1 3279.2 9.102 2976.2	11.17 3383.5 9.251 3048.4	11.95 3489 9.392 3130.5	12.72 3596.6 9.527 3215.0	13.5 3705.5 9.656 3300.5	14.28 3816.4 9.779 3388.0	15.05 3928.6 9.898 3477.1	v h s u	0.3 (69.1)
0.4 (75.83)	v h s u	7.796 3279.2 8.969 2967.36	8.376 3383.1 9.118 3048.1	8.956 3489 9.253 3130.8	9.536 3596.2 9.394 3214.8	10.11 3705.5 9.523 3301.1	10.69 3816.4 9.646 3388.8	11.27 3928.6 9.765 3477.8	v h s u	0.4 (75.83)
0.5 (81.31)	v h s u	6.232 3279.2 8.866 2967.6	6.698 3383.1 9.015 3048.2	7.163 3488.6 9.156 3130.5	7.626 3596.2 9.291 3214.9	8.091 3705.5 9.42 3301.0	8.555 3816 9.543 3388.3	9.018 3928.6 9.662 3477.7	v h s u	0.5 (81.31)
0.6 (85.92)	v h s u	5.189 3279.2 8.781 2967.86	5.576 3383 8.93 3048.4	5.961 3488.6 9.072 3130.9	6.348 3596.2 9.206 3215.3	6.733 3705.4 9.335 3301.4	7.12 3816 9.458 3388.8	7.506 3928.6 9.577 3478.2	v h s u	0.6 (85.92)
0.7 (89.93)	v h s u	4.445 3278.8 8.71 2967.65	4.778 3382.6 8.859 3048.1	5.108 3488.6 9 3131.0	5.438 3596.2 9.135 3215.5	5.77 3705.1 9.264 3301.2	6.101 3816 9.387 3388.9	6.431 3928.6 9.505 3478.4	v h s u	0.7 (89.93)
0.8 (93.48)	v h s u	3.888 3278.7 8.648 2967.66	4.179 3382.6 8.797 3048.3	4.468 3488.6 8.939 3131.2	4.758 3596.1 9.074 3215.5	5.048 3705 9.202 3301.2	5.337 3816 9.326 3389.0	5.626 3928.6 9.444 3478.5	v h s u	0.8 (93.48)
0.9 (96.68)	v h s u	3.457 3278.4 8.594 2967.27	3.715 3382.6 8.743 3048.3	3.973 3488.5 8.884 3130.9	4.231 3595.8 9.019 3215.0	4.488 3705 9.148 3301.1	4.745 3816 9.271 3389.0	5.003 3928 9.39 3477.7	v h s u	0.9 (96.68)
1 (99.61)	v h s u	3.135 3278.9 8.547 2965.4	3.369 3382.6 8.691 3045.7	3.603 3488.1 8.838 3127.8	3.836 3595.7 8.972 3212.1	4.07 3705 9.101 3298	4.204 3816 9.224 3395.6	4.538 3928 9.343 3474.2	v h s u	1 (99.61)
2 (120.19)	v h s u	1.559 3276.7 8.224 2964.9	1.677 3381.3 8.374 3045.9	1.793 3487.3 8.516 3128.7	1.91 3594.9 8.651 3212.9	2.026 3704.2 8.78 3299	2.143 3815.1 8.903 3386.5	2.259 3927.8 9.022 3476	v h s u	2 (120.19)
3 (133.51)	v h s u	1.036 3275.4 8.035 2964.6	1.114 3380.1 8.185 3045.9	1.192 3486 8.327 3128.4	1.27 3593.6 8.462 3212.6	1.348 3703.3 8.591 3298.9	1.426 3814.3 8.715 3386.5	1.504 3926.9 8.834 3475.7	v h s u	3 (133.51)

TABLE THREE (continue)
PROPERTIES OF SUPERHEATED STEAM

Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
		150	200	250	300	350	400	450		
4 (143.6)	v	0.4709	0.536	0.597	0.657	0.716	0.775	0.834	v	4 (143.6)
	h	2751.6	2860.6	2964.5	3067.2	3170.2	3273	3378.8	h	
	s	6.925	7.172	7.379	7.569	7.74	7.901	8.051	s	
	u	2563.24	2646.2	2725.7	2804.4	2883.8	2963	3045.2	u	
5 (151.8)	v		0.426	0.476	0.524	0.572	0.619	0.667	v	5 (151.8)
	h		2855.3	2961.1	3064.6	3168.1	3272	3377.5	h	
	s		7.06	7.273	7.462	7.635	7.796	7.947	s	
	u		2642.3	2723.1	2802.6	2882.1	2962.5	3044.0	u	
6 (158.81)	v		0.353	0.395	0.435	0.476	0.515	0.554	v	6 (158.81)
	h		2849.5	2957.7	3062.3	3166.4	3270.7	3376.2	h	
	s		6.967	7.183	7.375	7.549	7.71	7.861	s	
	u		2637.7	2720.7	2801.3	2880.8	2961.7	3043.8	u	
7 (164.92)	v		0.3	0.337	0.372	0.407	0.44	0.474	v	7 (164.92)
	h		2844.3	2954.2	3058.5	3164.3	3268.9	3374.9	h	
	s		6.887	7.104	7.3	7.475	7.637	7.788	s	
	u		2634.3	2718.3	2798.1	2879.4	2960.9	3043.1	u	
8 (170.38)	v		0.261	0.294	0.325	0.355	0.385	0.415	v	8 (170.38)
	h		2838.7	2950.5	3057.4	3162.5	3267.3	3373.3	h	
	s		6.815	7.04	7.235	7.414	7.573	7.725	s	
	u		2629.9	2715.3	2797.4	2878.5	2959.3	3041.3	u	
9 (175.33)	v		0.23	0.26	0.287	0.315	0.342	0.368	v	9 (175.33)
	h		2832.7	2947	3054.8	3160.4	3266	3372	h	
	s		6.751	6.98	7.178	7.354	7.517	7.67	s	
	u		2625.7	2713.0	2796.5	2876.9	2958.2	3040.8	u	
10 (179.84)	v		0.206	0.234	0.259	0.284	0.309	0.332	v	10 (179.84)
	h		2829	2943.1	3052.2	3158.7	3264.7	3371.1	h	
	s		6.695	6.927	7.127	7.305	7.468	7.621	s	
	u		2623.0	2709.1	2793.2	2874.7	2955.7	3039.1	u	
15 (198.25)	v			0.152	0.17	0.187	0.204	0.219	v	15 (198.25)
	h			2923.8	3038.9	3148.8	3256.6	3363.5	h	
	s			6.711	6.922	7.106	7.272	7.427	s	
	u			2695.8	2783.9	2868.3	2950.6	3035.0	u	
20 (212.34)	v			0.112	0.126	0.138	0.151	0.164	v	20 (212.34)
	h			2902.3	3025.2	3138.6	3248.9	3357.9	h	
	s			6.546	6.77	6.96	7.131	7.287	s	
	u			2678.3	2773.2	2862.6	2946.9	3029.9	u	
25 (223.91)	v			0.0875	0.0992	0.1101	0.1204	0.1306	v	25 (223.91)
	h			2879.6	3010.6	3128.3	3240.4	3351.4	h	
	s			6.408	6.644	6.845	7.019	7.177	s	
	u			2660.85	2762.6	2853.05	2939.4	3024.9	u	
30 (233.81)	v			0.0709	0.0815	0.0907	0.0995	0.1082	v	30 (233.81)
	h			2855	2995.2	3117.6	3232.6	3344.7	h	
	s			6.286	6.543	6.748	6.926	7.086	s	
	u			2642.3	2750.7	2845.5	2934.1	3020.1	u	
35 (242.51)	v			0.0585	0.0686	0.0769	0.0846	0.0921	v	35 (242.51)
	h			2824.9	2978.9	3106.4	3224.1	3338.2	h	
	s			6.168	6.449	6.664	6.845	7.008	s	
	u			2620.15	2738.8	2837.25	2928	3015.85	u	

TABLE THREE (continue)
PROPERTIES OF SUPERHEATED STEAM

Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
		500	550	600	650	700	750	800		
4 (143.6)	v	0.893	0.951	1.009	1.068	1.126	1.184	1.242	v	4 (143.6)
	h	3485.1	3592.8	3702.5	3813.8	3926.5	4041.2	4156.8	h	
	s	8.193	8.328	8.458	8.581	8.7	8.815	8.926	s	
	u	3127.9	3212.4	3298.9	3386.6	3476.1	3567.6	3660	u	
5 (151.8)	v	0.713	0.76	0.806	0.854	0.9	0.947	0.993	v	5 (151.8)
	h	3483.8	3591.9	3701.6	3813	3926	4040.4	4156.7	h	
	s	8.089	8.224	8.354	8.477	8.597	8.712	8.823	s	
	u	3127.3	3211.9	3298.6	3386.0	3476.0	3566.9	3660.2	u	
6 (158.81)	v	0.594	0.632	0.671	0.71	0.749	0.787	0.827	v	6 (158.81)
	h	3482.6	3591.1	3700.8	3812.2	3925.2	4040	4156	h	
	s	8.003	8.139	8.269	8.392	8.512	8.627	8.738	s	
	u	3126.2	3211.9	3298.2	3386.2	3475.8	3567.8	3659.8	u	
7 (164.92)	v	0.508	0.541	0.575	0.608	0.642	0.675	0.709	v	7 (164.92)
	h	3481.7	3590.1	3700	3811.6	3924.8	4039.5	4155.5	h	
	s	7.931	8.067	8.197	8.321	8.44	8.555	8.666	s	
	u	3126.1	3211.4	3297.5	3386.0	3475.4	3567.0	3659.2	u	
8 (170.38)	v	0.444	0.473	0.503	0.532	0.561	0.591	0.62	v	8 (170.38)
	h	3480.5	3588.9	3699.1	3810.5	3923.9	4038.7	4155.5	h	
	s	7.867	8.004	8.134	8.258	8.378	8.493	8.604	s	
	u	3125.3	3210.5	3296.7	3384.9	3475.1	3565.9	3659.5	u	
9 (175.33)	v	0.395	0.42	0.447	0.472	0.499	0.525	0.551	v	9 (175.33)
	h	3479.6	3588.1	3698.6	3810.1	3923.4	4038.3	4154.7	h	
	s	7.813	7.949	8.079	8.204	8.323	8.438	8.55	s	
	u	3124.1	3210.1	3296.3	3385.3	3474.3	3565.8	3658.8	u	
10 (179.84)	v	0.356	0.38	0.403	0.427	0.451	0.475	0.497	v	10 (179.84)
	h	3478.3	3587.2	3697.4	3809.6	3922.7	4037.8	4154.2	h	
	s	7.764	7.901	8.031	8.156	8.275	8.39	8.503	s	
	u	3122.3	3207.2	3294.4	3382.6	3471.7	3562.8	3657.2	u	
15 (198.25)	v	0.236	0.252	0.268	0.284	0.299	0.315	0.331	v	15 (198.25)
	h	3472.8	3582.5	3693.5	3805.8	3919.7	4035.2	4152.1	h	
	s	7.572	7.709	7.84	7.965	8.085	8.201	8.313	s	
	u	3118.8	3204.5	3291.5	3379.8	3471.2	3562.7	3655.6	u	
20 (212.34)	v	0.176	0.188	0.199	0.212	0.224	0.236	0.248	v	20 (212.34)
	h	3467.2	3577.8	3689.3	3802.3	3916.7	4032.3	4149.5	h	
	s	7.433	7.571	7.703	7.829	7.95	8.066	8.177	s	
	u	3115.2	3201.8	3291.3	3378.3	3468.7	3560.3	3653.5	u	
25 (223.91)	v	0.1402	0.1502	0.1597	0.1694	0.179	0.1884	0.1977	v	25 (223.91)
	h	3461.7	3572.7	3685.4	3798.9	3913.7	4029.7	4147.4	h	
	s	7.325	7.464	7.596	7.723	7.844	7.96	8.073	s	
	u	3111.2	3197.2	3286.15	3375.4	3466.2	3558.7	3653.15	u	
30 (233.81)	v	0.1164	0.1247	0.1327	0.1407	0.1487	0.1566	0.1645	v	30 (233.81)
	h	3456.2	3568.4	3681.2	3795.1	3910.3	4026.7	4144.8	h	
	s	7.235	7.375	7.509	7.636	7.757	7.874	7.987	s	
	u	3107	3194.3	3283.1	3373	3464.2	3556.9	3651.3	u	
35 (242.51)	v	0.0993	0.1064	0.1134	0.1203	0.1272	0.134	0.1408	v	35 (242.51)
	h	3450.9	3563.7	3677.3	3791.6	3907.3	4024.2	4142.3	h	
	s	7.159	7.3	7.434	7.561	7.683	7.8	7.914	s	
	u	3103.35	3191.3	3280.4	3370.55	3462.1	3555.2	3649.5	u	

TABLE THREE (continue)
PROPERTIES OF SUPERHEATED STEAM

Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
					300	350	400	450		
40 (250.31)	v h s u				0.059 2962.3 6.365 2726.3	0.0665 3094.9 6.588 2828.9	0.0735 3215.9 6.774 2921.9	0.0801 3321.4 6.939 3001	v h s u	40 (250.31)
45 (257.38)	v h s u				0.0515 2945.4 6.286 2713.7	0.0584 3083.3 6.519 2820.5	0.0648 3207 6.71 2915.4	0.0708 3324.5 6.878 3005.9	v h s u	45 (257.38)
50 (263.85)	v h s u				0.0455 2925.2 6.211 2697.7	0.0521 3071.2 6.455 2810.7	0.0579 3198.4 6.651 2908.9	0.0635 3317.7 6.823 3000.2	v h s u	50 (263.85)
60 (275.49)	v h s u				0.0363 2883.2 6.069 2665.4	0.0423 3045.5 6.339 2791.7	0.0475 3179.9 6.547 2894.9	0.0523 3303.5 6.724 2989.7	v h s u	60 (275.49)
70 (285.74)	v h s u				0.0296 2838.9 5.932 2631.7	0.0353 3018.8 6.234 2771.7	0.04 3161.1 6.454 2881.1	0.0442 3289 6.637 2979.6	v h s u	70 (285.74)
80 (294.92)	v h s u				0.0241 2781.1 5.783 2588.3	0.03 2989.9 6.135 2749.9	0.0344 3141.8 6.369 2866.6	0.0382 3274.4 6.56 2968.8	v h s u	80 (294.92)
90 (303.25)	v h s u					0.0258 2959.2 6.041 2727.0	0.03 3121.5 6.292 2851.5	0.0335 3259.4 6.49 2957.9	v h s u	90 (303.25)
100 (310.91)	v h s u					0.0224 2925.6 5.949 2701.6	0.0265 3099.9 6.219 2834.9	0.0298 3243.9 6.425 2945.9	v h s u	100 (310.91)
120 (324.6)	v h s u					0.0172 2840.3 5.76 2633.9	0.0211 3054.7 6.081 2801.5	0.0242 3211.3 6.306 2920.9	v h s u	120 (324.6)
140 (336.6)	v h s u					0.0132 2751.2 5.554 2566.4	0.0173 3005.4 5.951 2763.2	0.02 3177.4 6.198 2897.4	v h s u	140 (336.6)
160 (347.29)	v h s u					0.0097 2603.9 5.282 2448.7	0.0143 2950.7 5.824 2721.9	0.017 3141.7 6.097 2869.7	v h s u	160 (347.29)
180 (356.91)	v h s u						0.0119 2889.5 5.694 2675.3	0.0146 3104.1 6.002 2841.3	v h s u	180 (356.91)

TABLE THREE (continue)
PROPERTIES OF SUPERHEATED STEAM

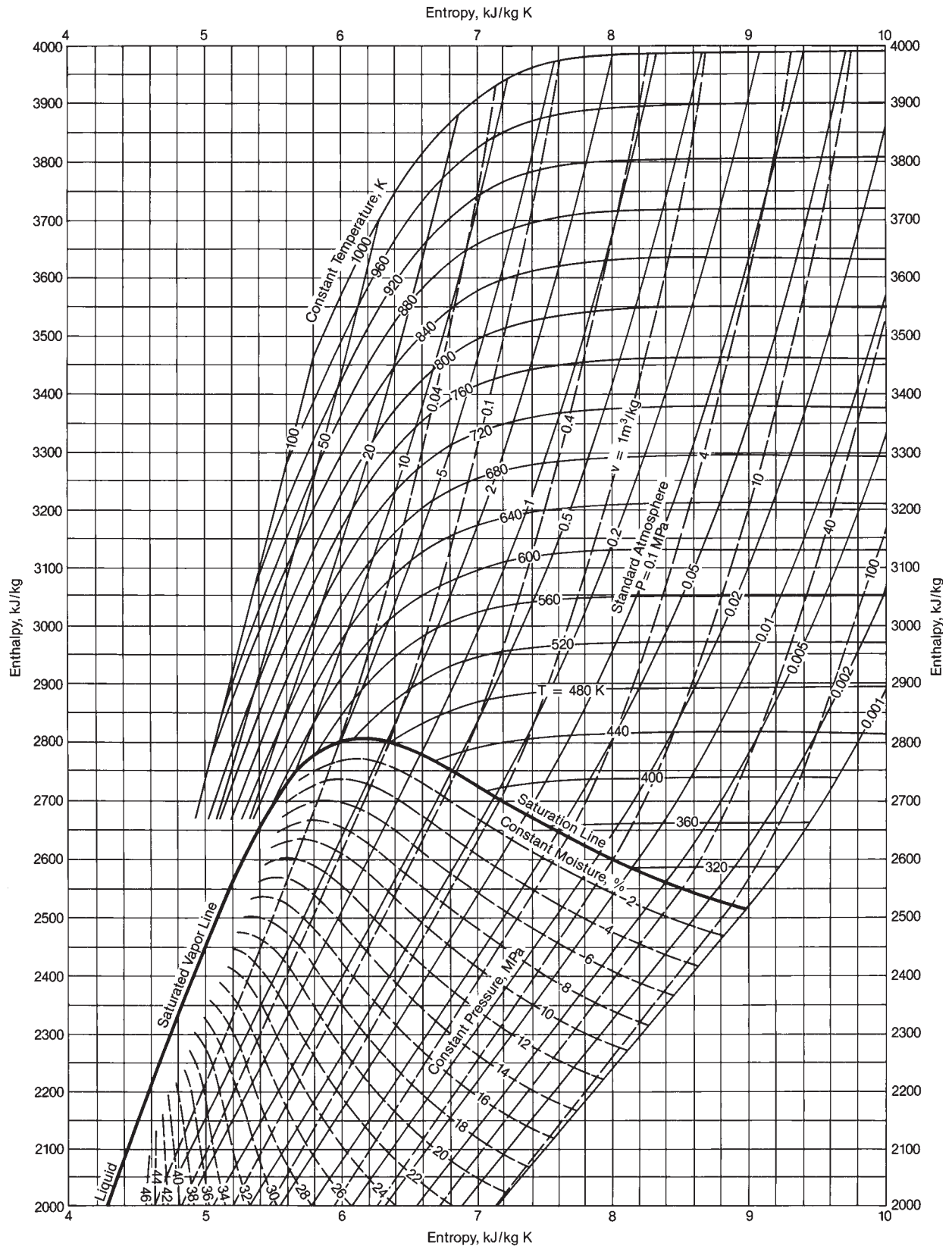
Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
		500	550	600	650	700	750	800		
40 (250.31)	v	0.0866	0.0929	0.099	0.1052	0.1111	0.1171	0.123	v	40 (250.31)
	h	3445	3558.6	3673	3787.8	3904.3	4021.6	4140.1	h	
	s	7.091	7.234	7.368	7.497	7.619	7.737	7.85	s	
	u	3098.6	3187	3277	3367	3459.9	3553.2	3648.1	u	
45 (257.38)	v	0.0766	0.0823	0.0878	0.0932	0.0986	0.1041	0.1092	v	45 (257.38)
	h	3439.5	3553.9	3668.7	3784.3	3900.9	4019	4137.6	h	
	s	7.032	7.175	7.31	7.44	7.562	7.681	7.794	s	
	u	3094.8	3183.6	3273.6	3364.9	3457.2	3550.6	3646.2	u	
50 (263.85)	v	0.0688	0.0739	0.0789	0.0838	0.0887	0.0935	0.0983	v	50 (263.85)
	h	3433.9	3549.2	3664.5	3781	3897.9	4016.1	4135.4	h	
	s	6.978	7.122	7.259	7.388	7.512	7.63	7.744	s	
	u	3089.9	3179.7	3270.0	3362.0	3454.4	3548.6	3643.9	u	
60 (275.49)	v	0.0568	0.0612	0.0654	0.0696	0.0737	0.0778	0.0817	v	60 (275.49)
	h	3422.4	3539.4	3656.4	3773.7	3891.9	4010.9	4230.7	h	
	s	6.882	7.029	7.167	7.298	7.422	7.542	7.656	s	
	u	3081.6	3172.2	3264.0	3356.1	3449.7	3544.1	3740.5	u	
70 (285.74)	v	0.0482	0.052	0.0557	0.0593	0.0629	0.0665	0.0699	v	70 (285.74)
	h	3410.8	3529.6	3648.2	3766.5	3885.5	4005.8	4126.1	h	
	s	6.8	6.949	7.088	7.22	7.346	7.466	7.581	s	
	u	3073.4	3165.6	3258.3	3351.4	3445.2	3540.3	3636.8	u	
80 (294.92)	v	0.0418	0.0452	0.0485	0.0517	0.0549	0.058	0.0611	v	80 (294.92)
	h	3398.8	3519.7	3639.37	3759.2	3879.1	4000.2	4121.4	h	
	s	6.727	6.879	7.02	7.153	7.28	7.401	7.516	s	
	u	3064.4	3158.1	3251.4	3345.6	3439.9	3536.2	3632.6	u	
90 (303.25)	v	0.0368	0.0399	0.0429	0.0458	0.0487	0.0514	0.0542	v	90 (303.25)
	h	3386.9	3509.9	3631.2	3751.9	3873.2	3994.7	4116.7	h	
	s	6.661	6.815	6.958	7.093	7.22	7.342	7.459	s	
	u	3055.7	3150.8	3245.1	3339.7	3434.9	3532.1	3628.9	u	
100 (310.91)	v	0.0329	0.0357	0.0384	0.0411	0.0437	0.0462	0.0487	v	100 (310.91)
	h	3374.8	3500.1	3622.7	3744.7	3867.1	3989.2	4112.3	h	
	s	6.601	6.757	6.902	7.038	7.167	7.289	7.407	s	
	u	3045.8	3143.1	3238.7	3333.7	3430.1	3527.2	3625.3	u	
120 (324.6)	v	0.0269	0.0293	0.0317	0.034	0.0361	0.0383	0.0404	v	120 (324.6)
	h	3349.6	3479.9	3605.9	3730.5	3854.4	3978.5	4102.6	h	
	s	6.491	6.654	6.803	6.942	7.072	7.197	7.315	s	
	u	3026.8	3128.3	3225.5	3322.5	3421.2	3518.9	3617.8	u	
140 (336.6)	v	0.0225	0.0248	0.0269	0.0288	0.0308	0.0327	0.0345	v	140 (336.6)
	h	3323.9	3459	3588.5	3715.7	3842	3967.1	4093.2	h	
	s	6.394	6.563	6.716	6.858	6.991	7.117	7.237	s	
	u	3008.9	3111.8	3211.9	3312.5	3410.8	3509.3	3610.2	u	
160 (347.29)	v	0.0193	0.0214	0.0232	0.025	0.0268	0.0284	0.03	v	160 (347.29)
	h	3297.3	3437.9	3571.3	3701.1	3829.6	3956.7	4084.2	h	
	s	6.306	6.482	6.639	6.784	6.919	7.047	7.168	s	
	u	2988.5	3095.5	3200.1	3301.1	3400.8	3502.3	3604.2	u	
180 (356.91)	v	0.0168	0.0187	0.0204	0.0221	0.0236	0.0251	0.0266	v	180 (356.91)
	h	3269.7	3416.2	3553.4	3686.2	3816.7	3946	4074.8	h	
	s	6.224	6.407	6.569	6.717	6.855	6.984	7.107	s	
	u	2967.3	3079.6	3186.2	3288.4	3391.9	3494.2	3596	u	

TABLE THREE (continue)
PROPERTIES OF SUPERHEATED STEAM

Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
							400	450		
200 (365.66)	v h s u						0.01 2817.2 5.554 2617.2	0.01278 3063.7 5.909 2808.1	v h s u	200 (365.66)
250	v h s u						0.00603 2571 5.13 2420.3	0.00922 2953.6 5.68 2723.1	v h s u	250
300	v h s u						0.00297 2183.6 4.522 2094.5	0.00677 2824.5 5.436 2621.4	v h s u	300
350	v h s u						0.00213 1999.5 4.228 1925.0	0.00498 2675.9 5.203 2501.6	v h s u	350
400	v h s u						0.00191 1932.1 4.121 1855.7	0.0037 2519 4.956 2371.0	v h s u	400
450	v h s u						0.0018 1901.7 4.057 1820.7	0.00295 2387.9 4.753 2255.2	v h s u	450
500	v h s u						0.00174 1878.9 4.01 1791.9	0.00252 2298.2 4.61 2172.2	v h s u	500
600	v h s u						0.00163 1847.9 3.939 1750.1	0.00209 2189.5 4.427 2064.1	v h s u	600
700	v h s u						0.00156 1828.2 3.886 1719.0	0.0019 2131.8 4.32 1998.8	v h s u	700
800	v h s u						0.00152 1814.7 3.843 1693.1	0.00176 2094.9 4.245 1954.1	v h s u	800
900	v h s u						0.00148 1804.9 3.806 1671.7	0.00169 2070.1 4.186 1918	v h s u	900
1000	v h s u						0.00145 1796.6 3.773 1651.6	0.00167 2051.5 4.137 1884.5	v h s u	1000

TABLE THREE (continue)
PROPERTIES OF SUPERHEATED STEAM

Pressure P bar (T sat °C)	Property	Temperature Range T (°C)							Property	Pressure P bar (T sat °C)
		500	550	600	650	700	750	800		
200 (365.66)	v	0.01485	0.01662	0.01824	0.01975	0.0212	0.02259	0.02395	v	200 (365.66)
	h	3240.9	3394.2	3535.8	3671.2	3803.9	3935	4065.5	h	
	s	6.146	6.339	6.505	6.656	6.796	6.928	7.052	s	
	u	2943.9	3061.8	3171	3276.2	3379.9	3483.2	3586.5	u	
250	v	0.01117	0.01276	0.01418	0.01548	0.01669	0.01786	0.01897	v	250
	h	3166.1	3336.8	3490	3633.5	3771.8	3908	4042	h	
	s	5.966	6.184	6.361	6.521	6.667	6.803	6.931	s	
	u	2886.85	3017.8	3135.5	3246.5	3354.6	3461.5	3567.8	u	
300	v	0.00872	0.0102	0.01147	0.01263	0.01369	0.0147	0.01567	v	300
	h	3084.8	3277.6	3443.3	3594.4	3739.1	3880.7	4018.5	h	
	s	5.797	6.039	6.235	6.404	6.557	6.698	6.829	s	
	u	2823.2	2971.6	3099.2	3215.5	3328.4	3439.7	3548.4	u	
350	v	0.00694	0.00837	0.00955	0.0106	0.01155	0.01245	0.01331	v	350
	h	2997.9	3215.5	3395.1	3556.3	3707.4	3853	3995.4	h	
	s	5.638	5.908	6.12	6.299	6.459	6.605	6.74	s	
	u	2755	2922.6	3060.9	3185.3	3303.2	3417.3	3529.6	u	
400	v	0.00563	0.007	0.0081	0.00907	0.00996	0.01077	0.01152	v	400
	h	2906.7	3151.7	3346.7	3517.4	3675	3825.7	3972	h	
	s	5.477	5.784	6.014	6.204	6.371	6.522	6.661	s	
	u	2681.5	2871.7	3022.7	3154.6	3276.6	3394.9	3511.2	u	
450	v	0.00465	0.00595	0.00692	0.00791	0.00872	0.00948	0.01018	v	450
	h	2814	3086.8	3297.6	3478.2	3642.6	3798.4	3948.6	h	
	s	5.324	5.666	5.915	6.116	6.29	6.445	6.589	s	
	u	2604.75	2819.1	2986.2	3122.3	3250.2	3371.8	3490.5	u	
500	v	0.00392	0.00514	0.00614	0.00699	0.00775	0.00846	0.00912	v	500
	h	2725.4	3022.2	3248.7	3439.4	3610.3	3771.2	3925.5	h	
	s	5.181	5.554	5.822	6.034	6.215	6.376	6.523	s	
	u	2529.4	2765.2	2941.7	3089.9	3222.8	3348.2	3469.5	u	
600	v	0.00297	0.00397	0.00485	0.00562	0.00629	0.0069	0.000748	v	600
	h	2573	2897.6	3152.3	3362.9	3547.4	3717.9	3879.7	h	
	s	4.941	5.348	5.648	5.884	6.078	6.249	6.404	s	
	u	2394.8	2659.4	2861.3	3025.7	3170.0	3303.9	3834.8	u	
700	v	0.00248	0.00323	0.00399	0.00466	0.00527	0.00584	0.00633	v	700
	h	2468.9	2798.3	3061.5	3289.7	3486.7	3666.3	3835.8	h	
	s	4.772	5.177	5.495	5.749	5.957	6.137	6.298	s	
	u	2295.3	2572.2	2782.2	2963.5	3117.8	3257.5	3392.7	u	
800	v	0.00219	0.00277	0.00337	0.00399	0.00453	0.00508	0.0055	v	800
	h	2399	2744.8	2981.7	3221.1	3429.2	3611	3793.2	h	
	s	4.651	5.04	5.361	5.628	5.848	6.036	6.204	s	
	u	2223.8	2523.2	2712.1	2901.9	3066.8	3204.6	3353.2	u	
900	v	0.00202	0.00246	0.00297	0.00349	0.00397	0.00422	0.00488	v	900
	h	2351.1	2643.8	2915.4	3159.5	3375.2	3570.9	3753.2	h	
	s	4.561	4.93	5.248	5.521	5.748	5.945	6.119	s	
	u	2169.3	2422.4	2648.1	2845.4	3017.9	3191.1	3314	u	
1000	v	0.00189	0.00288	0.00267	0.00311	0.00354	0.00394	0.00434	v	1000
	h	2316.1	2594.3	2857.5	3105.2	3324.4	3526.4	3714.3	h	
	s	4.491	4.839	5.15	5.427	5.657	5.86	6.039	s	
	u	2127.1	2306.3	2590.5	2794.2	2970.4	3132.4	3280.3	u	



Mollier diagram (H - s) for steam – SI units.

Conversions of Units

Length	Volume	Velocity	Pressure
1 cm = 0.3937 in	1 ft ³ = 7.481 gal (U.S.)	1 mph = 1.467 ft/sec	1 bar = 10 ⁵ Pa
1 m = 3.281 ft	1 gal (Brit.) = 1.2 gal (U.S.)	1 mph = 0.8684 knot	1 atm = 101.3 kPa
1 km = 0.6214 mi	1 L = 10 ⁻³ m ³	1 ft/sec = 0.3048 m/s	1 atm = 1.0133 bar
1 mi = 1.609 km	1 L = 0.2642 gal	1 km/h = 0.2778 m/s	1 ft H ₂ O = 0.4331 psi
1 mi = 5280 ft	1 m ³ = 264.2 gal		1 psi = 6.895 kPa
1 mi = 1760 yd	1 m ³ = 35.31 ft ³		1 atm = 14.7 psi
Mass	Force	Work and Heat	power
1 oz = 28.35 g	1 lbf = 0.4448 X 10 ⁶ dyn	1 Btu = 778 ft-lb	1 hp = 2545 Btu/hr
1 lbm = 0.4536 kg	1 dyn = 2.248 X 10 ⁻⁶ lbf	1 cal = 3.088 ft-lb	1 hp = 0.7455 kW
1 slug = 32.17 lbm	1 kip = 1000 lbf	1 cal = 0.003968 Btu	1 ton = 12000 Btu/hr
1 slug = 14.59 kg	1 N = 0.2248 lbf	1 Btu = 1055 J	1W = 3.414 Btu/hr
1 kg = 2.205 lbm		1 Btu = 0.2929 W.hr	1 kW = 1.341 hp
		1 kWh = 3414 Btu	1 ton = 3.52 kW

Useful Formulas and Constants

Avogadro 's number (N _a)= 6.022045 *10 ²⁶ molecules/kg.mol
Stefan-Boltzmann constant(σ)=56.7 *10 ⁻¹² kW/m ² .K ⁴
Standard gravitational acceleration g _c = 9.80665 m/s =32.174 lbm ft /s ² lbf
T(K) = T(^o C) + 273.15 T(oR) = T(^o F) + 459.67
Boltzmann's Constant (k)=1.38x10 ⁻²³ J/molecule K
Planck's constant (h) = 6.626x10 ⁻³⁴ J-s/molecule
Speed of light in vacuum (c) = 2.998*10 ⁸ m/s.
1 kmol occupies 22.41 m ³ at 1 atm and 0 °C
R _o = 8.314 kJ/kmole.K =1.986 Btu/lb.mole =1545 ft.lbf/lb.mole .

