

12.4 Steam Tables

SATURATED STEAM - TEMPERATURE TABLE

T °C	P bar	Spec. vol. m ³ =kg		Int. Ener. kJ/kg		Enthalpy kJ/kg		Entropy kJ=(kg°K)	
		Sat. liq. v _f X 1000	Sat. vap. v _g	Sat. liq. u _f	Sat. vap. u _g	Sat. liq. h _f	Sat. vap. h _g	Sat. liq. s _f	Sat. vap. s _g
0.01	0.0061	1.0002	206.1	0.01	2376	0.01	2501	0	9.156
4	0.0081	1.0001	157.2	16.79	2381	16.79	2509	0.061	9.051
5	0.0087	1.0001	147.1	21.00	2383	21	2511	0.0762	9.026
6	0.0093	1.0001	137.7	25.21	2384	25.21	2512	0.0912	9.000
8	0.0107	1.0001	120.9	33.61	2387	33.61	2516	0.1212	8.950
10	0.0123	1.0001	106.4	42.01	2389	42.01	2520	0.151	8.901
11	0.0131	1.0007	99.86	46.19	2391	46.19	2522	0.1658	8.876
12	0.0140	1.0007	93.79	50.40	2392	50.4	2523	0.1806	8.852
13	0.0150	1.0007	88.13	54.59	2393	54.59	2525	0.1953	8.828
14	0.0160	1.0007	82.85	58.80	2394	58.8	2527	0.2099	8.805
15	0.0170	1.0007	77.93	62.99	2396	62.99	2529	0.2245	8.781
16	0.0182	1.0013	73.34	67.17	2397	67.17	2531	0.239	8.758
17	0.0194	1.0013	69.05	71.36	2399	71.36	2533	0.2535	8.735
18	0.0206	1.0013	65.04	75.57	2400	75.57	2534	0.2679	8.712
19	0.0220	1.0013	61.30	79.76	2401	79.76	2536	0.2823	8.690
20	0.0234	1.002	57.79	83.94	2403	83.94	2538	0.2966	8.667
21	0.0249	1.002	54.52	88.13	2404	88.13	2540	0.3108	8.645
22	0.0264	1.002	51.45	92.32	2406	92.32	2542	0.3251	8.623
23	0.0281	1.0026	48.58	96.50	2407	96.5	2544	0.3392	8.601
24	0.0298	1.0026	45.89	100.7	2409	100.7	2545	0.3533	8.579
25	0.0317	1.0032	43.36	104.9	2410	104.9	2547	0.3673	8.558
26	0.0336	1.0032	41.00	109.0	2411	109.0	2549	0.3814	8.537
27	0.0357	1.0032	38.78	113.2	2412	113.2	2551	0.3953	8.515
28	0.0378	1.0038	36.69	117.4	2414	117.4	2553	0.4093	8.495
29	0.0401	1.0038	34.73	121.6	2415	121.6	2554	0.4231	8.474
30	0.0425	1.0045	32.90	125.8	2416	125.8	2556	0.4369	8.453
31	0.0450	1.0045	31.17	130.0	2418	130.0	2558	0.4507	8.433
32	0.0476	1.0051	29.54	134.1	2419	134.1	2560	0.4644	8.413
33	0.0503	1.0051	28.01	138.3	2421	138.3	2562	0.478	8.393
34	0.0532	1.0057	26.57	142.5	2422	142.5	2563	0.4917	8.373
35	0.0563	1.0057	25.22	146.7	2423	146.7	2565	0.5053	8.353
36	0.0595	1.0063	23.94	150.8	2425	150.8	2567	0.5188	8.333
38	0.0663	1.007	21.60	159.2	2427	159.2	2571	0.5457	8.295
40	0.0738	1.0076	19.52	167.5	2430	167.5	2574	0.5725	8.257
45	0.0959	1.010	15.26	188.4	2437	188.4	2583	0.6386	8.165
50	0.1235	1.012	12.03	209.3	2443	209.3	2592	0.7037	8.076
55	0.1576	1.015	9.569	230.2	2450	230.2	2601	0.7679	7.991
60	0.1994	1.017	7.671	251.1	2457	251.1	2610	0.8311	7.910
65	0.2503	1.020	6.197	272.0	2463	272.0	2618	0.8934	7.831
70	0.3119	1.023	5.042	293.0	2470	293.0	2627	0.9549	7.755
75	0.3858	1.026	4.131	313.9	2476	313.9	2635	1.016	7.682
80	0.4739	1.029	3.407	334.8	2482	334.9	2644	1.075	7.612

SATURATED STEAM - TEMPERATURE TABLE (Continued)

T °C	Spec. vol. m ³ /kg		Int. Ener. kJ/kg		Enthalpy kJ/kg		Entropy kJ/(kg°K)		
	P bar	Sat. liq. v _f X 1000	Sat. vap. v _g	Sat. liq. u _f	Sat. vap. u _g	Sat. liq. h _f	Sat. vap. h _g	Sat. liq. s _f	Sat. vap. s _g
85	0.5783	1.033	2.828	355.8	2488	355.9	2652	1.134	7.544
90	0.7013	1.036	2.361	376.8	2494	376.9	2660	1.193	7.479
95	0.8455	1.039	1.982	397.9	2501	398.0	2668	1.250	7.416
100	1.013	1.044	1.673	418.9	2507	419.0	2676	1.307	7.355
110	1.433	1.052	1.21	461.1	2518	461.3	2691	1.418	7.239
120	1.985	1.060	0.892	503.5	2529	503.7	2706	1.528	7.130
130	2.701	1.069	0.669	546.0	2540	546.3	2720	1.634	7.027
140	3.613	1.080	0.509	588.7	2550	589.1	2734	1.739	6.930
150	4.758	1.091	0.393	631.7	2559	632.2	2746	1.842	6.838
160	6.178	1.102	0.307	674.9	2568	675.5	2758	1.943	6.750
170	7.916	1.114	0.243	718.3	2576	719.2	2769	2.042	6.666
180	10.02	1.127	0.194	762.1	2584	763.2	2778	2.140	6.586
190	12.54	1.141	0.157	806.2	2589	807.6	2786	2.236	6.508
200	15.54	1.156	0.127	850.6	2596	852.4	2793	2.331	6.432
210	19.06	1.172	0.104	895.5	2600	897.8	2798	2.425	6.358
220	23.18	1.190	0.086	940.8	2603	943.6	2802	2.518	6.286
230	27.95	1.209	0.072	986.7	2603	990.1	2804	2.610	6.215
240	33.44	1.229	0.06	1033	2603	1037.3	2804	2.702	6.144
250	39.73	1.251	0.05	1080	2603	1085.3	2802	2.793	6.073
260	46.88	1.275	0.042	1128	2600	1134.4	2797	2.884	6.002
270	54.98	1.302	0.036	1177	2592	1184.5	2790	2.975	5.930
280	64.11	1.332	0.03	1227	2587	1236.0	2780	3.067	5.857
290	74.36	1.365	0.026	1279	2573	1289.0	2766	3.159	5.782
300	85.81	1.403	0.022	1332	2560	1344.0	2749	3.253	5.704
320	112.7	1.499	0.015	1445	2531	1461.5	2700	3.448	5.536
340	145.9	1.638	0.011	1570	2462	1594.1	2622	3.659	5.336
360	186.5	1.893	0.007	1725	2351	1760.5	2481	3.915	5.053
374.14	220.9	3.155	0.003155	2030	2030	2099.3	2099	4.430	4.430

SATURATED STEAM - PRESSURE TABLE

P bar	T °C	Spec. vol. m ³ =kg		Int. Ener. kJ/kg		Enthalpy kJ/kg		Entropy kJ=(kg ⁰ K)	
		Sat. liq. v _f X 1000	Sat. vap. v _g	Sat. liq. u _f	Sat. vap. u _g	Sat. liq. h _f	Sat. vap. h _g	Sat. liq. s _f	Sat. vap. s _g
0.04	28.96	1.004	34.80	121.4	2415	121.4	2554	0.423	8.475
0.06	36.15	1.006	23.75	151.5	2425	151.5	2567	0.521	8.331
0.08	41.5	1.008	18.11	173.8	2432	173.8	2577	0.593	8.229
0.1	45.8	1.010	14.68	191.8	2438	191.8	2585	0.649	8.150
0.2	60.07	1.017	7.649	251.4	2457	251.4	2610	0.832	7.908
0.3	69.11	1.023	5.229	289.2	2468	289.2	2625	0.944	7.769
0.4	75.87	1.026	3.994	317.5	2477	317.6	2637	1.026	7.670
0.5	81.33	1.030	3.240	340.4	2484	340.5	2646	1.091	7.594
0.6	85.94	1.033	2.732	359.8	2490	359.9	2653	1.145	7.532
0.7	89.95	1.036	2.365	376.6	2494	376.7	2660	1.192	7.480
0.8	93.5	1.039	2.087	391.6	2499	391.7	2666	1.233	7.435
0.9	96.71	1.041	1.870	405.1	2503	405.1	2671	1.270	7.395
1	99.62	1.043	1.694	417.3	2506	417.4	2675	1.303	7.359
1.5	111.4	1.053	1.159	466.9	2520	467.1	2694	1.434	7.223
2	120.2	1.061	0.886	504.5	2530	504.7	2707	1.530	7.127
3	133.6	1.073	0.606	561.1	2544	561.5	2725	1.672	6.992
4	143.6	1.084	0.463	604.3	2554	604.8	2739	1.777	6.896
5	151.9	1.093	0.375	639.7	2561	640.2	2749	1.861	6.821
6	158.9	1.101	0.316	669.9	2567	670.6	2757	1.931	6.760
7	165.0	1.108	0.273	696.4	2573	697.2	2764	1.992	6.708
8	170.4	1.115	0.240	720.2	2577	721.1	2769	2.046	6.663
9	175.4	1.121	0.215	741.8	2580	742.8	2774	2.095	6.623
10	179.9	1.127	0.194	761.7	2584	762.8	2778	2.139	6.586
20	212.4	1.177	0.100	906.4	2600	908.8	2800	2.447	6.341
30	233.9	1.217	0.067	1005	2604	1008	2804	2.646	6.187
40	250.4	1.252	0.050	1082	2602	1087	2801	2.796	6.070
50	264.0	1.286	0.039	1148	2597	1154	2794	2.920	5.973
60	275.6	1.319	0.032	1205	2590	1213	2784	3.027	5.889
70	285.9	1.352	0.027	1258	2580	1267	2772	3.121	5.813
80	295.1	1.384	0.024	1306	2570	1317	2758	3.207	5.743
90	303.4	1.418	0.021	1350	2558	1363	2742	3.286	5.677
100	311.1	1.453	0.018	1393	2545	1408	2725	3.360	5.614
110	318.2	1.489	0.016	1434	2530	1450	2706	3.429	5.553
120	324.8	1.527	0.014	1473	2513	1491	2685	3.496	5.492
130	331.0	1.567	0.013	1511	2496	1532	2662	3.561	5.432
140	336.8	1.611	0.012	1549	2477	1571	2638	3.623	5.372
150	342.3	1.658	0.010	1586	2456	1611	2611	3.685	5.310
160	347.4	1.711	0.009	1623	2432	1650	2581	3.746	5.246
170	352.4	1.770	0.008	1660	2405	1690	2547	3.808	5.178
180	357.0	1.839	0.008	1699	2375	1732	2510	3.871	5.105
190	361.5	1.924	0.007	1740	2338	1776	2465	3.938	5.024
200	365.8	2.036	0.006	1786	2295	1826	2411	4.013	4.931
220.9	374.1	3.155	0.003	2030	2029	2099	2099	4.430	4.430

SUPERHEATED STEAM

v in m ³ =kg, u in kJ/kg, h in kJ/kg, s in kJ=(kg°K)								
P= 0.06 bar					P= 0.35 bar			
T	v	u	h	s	v	u	h	s
80	27.13	2487	2650	8.580	4.625	2484	2646	7.756
100	28.68	2516	2688	8.685	4.895	2513	2684	7.863
120	30.22	2545	2726	8.784	5.163	2542	2723	7.964
160	33.30	2603	2802	8.969	5.696	2601	2801	8.152
200	36.38	2661	2880	9.140	6.228	2660	2878	8.324
240	39.46	2721	2958	9.298	6.757	2720	2957	8.483
280	42.54	2782	3037	9.446	7.286	2781	3036	8.631
320	45.62	2843	3117	9.586	7.814	2843	3116	8.771
360	48.69	2905	3198	9.718	8.341	2905	3197	8.903
400	51.77	2969	3280	9.843	8.872	2969	3279	9.029
450	55.62	3050	3383	9.992	9.532	3049	3383	9.178
500	59.47	3132	3489	10.13	10.19	3132	3489	9.319

SUPERHEATED STEAM

v in m ³ =kg, u in kJ/kg, h in kJ/kg, s in kJ=(kg°K)								
P= 0.7 bar					P= 1 bar			
T	v	u	h	s	v	u	h	s
100	2.434	2510	2680	7.534	1.695	2506	2676	7.361
120	2.571	2540	2720	7.637	1.793	2537	2717	7.467
160	2.841	2599	2798	7.828	1.984	2598	2796	7.660
200	3.108	2659	2877	8.001	2.172	2658	2875	7.834
240	3.374	2719	2956	8.161	2.359	2719	2954	7.995
280	3.639	2780	3035	8.310	2.545	2780	3034	8.144
320	3.904	2842	3115	8.450	2.730	2842	3115	8.285
360	4.170	2905	3196	8.583	2.917	2904	3196	8.417
400	4.434	2968	3279	8.708	3.102	2968	3278	8.543
450	4.764	3049	3383	8.858	3.334	3049	3382	8.693
500	5.094	3132	3488	8.999	3.565	3132	3488	8.834
550	5.423	3213	3593	9.129	3.796	3216	3596	8.969
600	5.753	3298	3701	9.257	4.027	3302	3705	9.097

SUPERHEATED STEAM

v in m ³ =kg, u in kJ/kg, h in kJ/kg, s in kJ=(kg°K)								
P= 1.5 bar					P= 3 bar			
T	v	u	h	s	v	u	h	s
120	1.188	2533	2711	7.269	XXX	XXX	XXX	XXX
160	1.317	2595	2793	7.466	0.6506	2587	2782	7.128
200	1.444	2656	2873	7.643	0.7162	2651	2866	7.311
240	1.570	2717	2953	7.805	0.7802	2713	2947	7.477
280	1.694	2779	3033	7.955	0.8438	2775	3029	7.630
320	1.819	2841	3113	8.096	0.9067	2838	3110	7.772
360	1.943	2903	3195	8.229	0.9692	2901	3192	7.906
400	2.067	2967	3277	8.355	1.031	2966	3275	8.033
450	2.221	3048	3382	8.505	1.109	3047	3380	8.183
500	2.376	3131	3488	8.646	1.186	3130	3486	8.325
550	2.530	3216	3595	8.781	1.264	3215	3594	8.460
600	2.684	3302	3704	8.910	1.341	3301	3703	8.589

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)								
P= 5 bar					P= 7 bar			
T	v	u	h	s	v	u	h	s
160	0.3836	2576	2767	6.865	X X X	X X X	X X X	X X X
200	0.4249	2643	2855	7.059	0.2999	2635	2845	6.886
240	0.4644	2708	2940	7.230	0.3292	2702	2932	7.064
280	0.5034	2771	3023	7.386	0.3574	2767	3017	7.223
320	0.5416	2835	3105	7.531	0.3852	2831	3101	7.370
360	0.5795	2899	3188	7.666	0.4125	2896	3185	7.506
400	0.617	2963	3272	7.793	0.4397	2961	3269	7.635
450	0.6642	3045	3377	7.945	0.4735	3043	3375	7.787
500	0.7109	3128	3484	8.087	0.507	3127	3482	7.930
550	0.7575	3213	3592	8.223	0.5405	3212	3590	8.066
600	0.8041	3300	3702	8.352	0.5738	3298	3700	8.195
650	0.8505	3388	3813	8.476	0.6071	3387	3812	8.320
700	0.8969	3477	3926	8.595	0.6403	3477	3925	8.439

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)								
P= 10 bar					P= 15 bar			
T	v	u	h	s	v	u	h	s
200	0.2059	2622	2828	6.694	0.1325	2598	2797	6.455
240	0.2275	2693	2920	6.882	0.1482	2677	2899	6.663
280	0.248	2760	3008	7.046	0.1627	2749	2993	6.838
320	0.2678	2826	3094	7.196	0.1765	2817	3082	6.994
360	0.2873	2892	3179	7.335	0.1899	2884	3169	7.136
400	0.3066	2957	3264	7.465	0.203	2951	3256	7.269
450	0.3304	3040	3371	7.618	0.2192	3035	3364	7.424
500	0.3541	3124	3478	7.762	0.2352	3120	3473	7.570
550	0.3776	3210	3587	7.899	0.251	3206	3583	7.707
600	0.4011	3297	3698	8.029	0.2668	3294	3694	7.838
650	0.4245	3385	3810	8.153	0.2825	3383	3806	7.964
700	0.4478	3475	3923	8.273	0.2981	3473	3920	8.084

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)								
P= 20 bar					P= 30 bar			
T	v	u	h	s	v	u	h	s
240	0.1084	2660	2876	6.495	0.0682	2620	2824	6.226
280	0.12	2736	2976	6.683	0.0771	2710	2941	6.446
320	0.1308	2808	3069	6.845	0.085	2788	3043	6.624
360	0.1411	2877	3159	6.992	0.0923	2862	3139	6.780
400	0.1512	2945	3248	7.127	0.0994	2933	3231	6.921
450	0.1635	3030	3357	7.284	0.1079	3020	3344	7.083
500	0.1757	3116	3468	7.432	0.1162	3108	3456	7.234
550	0.1877	3203	3578	7.570	0.1244	3196	3569	7.375
600	0.1996	3291	3690	7.702	0.1324	3285	3682	7.508
650	0.2114	3380	3803	7.828	0.1404	3375	3796	7.636
700	0.2232	3471	3917	7.949	0.1484	3466	3912	7.757

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)								
P= 40 bar					P= 60 bar			
T	v	u	h	s	v	u	h	s
280	0.0555	2680	2902	6.257	0.0332	2605	2804	5.925
320	0.062	2767	3015	6.455	0.0387	2720	2952	6.184
360	0.0679	2846	3117	6.621	0.0433	2811	3071	6.378
400	0.0734	2920	3213	6.769	0.0474	2893	3177	6.541
450	0.08	3010	3330	6.936	0.0521	2989	3302	6.719
500	0.0864	3100	3445	7.090	0.0567	3082	3422	6.880
550	0.0927	3189	3560	7.233	0.061	3175	3541	7.029
600	0.0988	3279	3674	7.369	0.0653	3267	3658	7.168
650	0.1049	3370	3790	7.497	0.0694	3360	3776	7.299
700	0.1109	3462	3906	7.620	0.0735	3453	3894	7.423
750	0.1169	3556	4023	7.737	0.0776	3547	4013	7.542

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)								
P= 80 bar					P= 100 bar			
T	v	u	h	s	v	u	h	s
320	0.0268	2663	2877	5.949	0.0193	2588	2781	5.710
360	0.0309	2773	3020	6.182	0.0233	2729	2962	6.006
400	0.0343	2864	3138	6.363	0.0264	2832	3096	6.212
450	0.0382	2966	3272	6.555	0.0297	2944	3241	6.419
500	0.0417	3065	3398	6.724	0.0328	3046	3374	6.597
550	0.0451	3160	3521	6.878	0.0356	3145	3501	6.756
600	0.0485	3254	3642	7.020	0.0384	3241	3625	6.903
650	0.0517	3349	3762	7.154	0.041	3338	3748	7.040
700	0.0548	3444	3882	7.281	0.0436	3434	3870	7.169
750	0.0579	3540	4003	7.402	0.0461	3532	3993	7.291

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)								
P= 120 bar					P= 140 bar			
T	v	u	h	s	v	u	h	s
360	0.0181	2678	2896	5.836	0.0142	2618	2816	5.660
400	0.0211	2798	3051	6.075	0.0172	2761	3002	5.945
450	0.0241	2919	3208	6.300	0.0201	2893	3174	6.192
500	0.0268	3027	3348	6.487	0.0225	3007	3322	6.390
550	0.0293	3129	3480	6.653	0.0247	3113	3459	6.562
600	0.0316	3229	3608	6.804	0.0268	3216	3591	6.717
650	0.0339	3327	3734	6.944	0.0288	3316	3720	6.860
700	0.0361	3425	3858	7.075	0.0307	3416	3846	6.994
750	0.0382	3524	3982	7.199	0.0326	3515	3972	7.120
800	0.0403	3611	4095	7.305	0.0344	3604	4085	7.227

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)									
P= 160 bar					P= 180 bar				
T	v	u	h	s	v	u	h	s	
360	0.0111	2538	2716	5.461	0.0081	2418	2564	5.192	
400	0.0143	2719	2948	5.817	0.0119	2673	2887	5.689	
450	0.017	2866	3138	6.091	0.0146	2837	3100	5.995	
500	0.0193	2986	3295	6.301	0.0168	2965	3267	6.218	
550	0.0213	3097	3438	6.480	0.0187	3079	3416	6.405	
600	0.0232	3202	3573	6.640	0.0204	3188	3556	6.570	
650	0.025	3305	3705	6.786	0.0221	3292	3690	6.719	
700	0.0267	3407	3834	6.922	0.0236	3397	3821	6.858	
750	0.0284	3507	3961	7.050	0.0251	3499	3951	6.988	
800	0.03	3608	4088	7.171	0.0266	3600	4079	7.110	

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)									
P= 200 bar					P= 240 bar				
T	v	u	h	s	v	u	h	s	
400	0.0099	2620	2818	5.554	0.0067	2479	2639	5.239	
450	0.0127	2806	3060	5.902	0.0098	2738	2973	5.720	
500	0.0148	2942	3238	6.140	0.0117	2897	3178	5.994	
550	0.0166	3061	3393	6.335	0.0134	3026	3347	6.207	
600	0.0182	3174	3538	6.505	0.0148	3145	3501	6.387	
650	0.0197	3281	3675	6.658	0.0161	3259	3645	6.548	
700	0.0211	3387	3809	6.799	0.0174	3366	3784	6.695	
750	0.0225	3490	3940	6.931	0.0186	3473	3919	6.830	
800	0.0239	3592	4070	7.054	0.0197	3579	4052	6.957	
900	0.0264	3782	4310	7.267	0.0219	3787	4312	7.189	

SUPERHEATED STEAM

v in m ³ /kg, u in kJ/kg, h in kJ/kg, s in kJ/(kg ^o K)									
P= 280 bar					P= 320 bar				
T	v	u	h	s	v	u	h	s	
400	0.0038	2224	2331	4.749	0.0024	1979	2056	4.324	
450	0.0076	2662	2875	5.537	0.006	2572	2764	5.346	
500	0.0096	2845	3114	5.857	0.0079	2794	3047	5.725	
550	0.0111	2989	3300	6.090	0.0094	2950	3251	5.981	
600	0.0124	3116	3463	6.282	0.0106	3085	3425	6.186	
650	0.0136	3234	3614	6.451	0.0117	3209	3583	6.363	
700	0.0147	3347	3758	6.603	0.0127	3326	3733	6.520	
750	0.0158	3455	3898	6.742	0.0137	3438	3876	6.664	
800	0.0168	3563	4033	6.872	0.0146	3548	4015	6.797	
900	0.0187	3775	4299	7.108	0.0163	3763	4285	7.037	