

Table 3 Thermodynamic Properties of WATER at Saturation*

Fahr. Temp. (°F)	Absolute Pressure $P_s \times 10^6$		Specific Volume, cu ft per lb			Enthalpy, Btu per lb			Entropy, Btu per (lb) (°F)			Fahr. Temp. (°F)
	Lb/Sq In.	In. Hg	Sat. Solid v_f	Evap. $v_{fg} \times 10^{-4}$	Sat. Vapor $v_g \times 10^{-4}$	Sat. Solid h_f	Evap. h_{fg}	Sat. Vapor h_g	Sat. Solid s_f	Evap. s_{fg}	Sat. Vapor s_g	
-180	0.004949	0.01008	0.01722	30070	26070	-222.03	1212.43	990.38	-0.4907	0.4646	3.5549	-180
-155	0.009940	0.01840	0.01723	20080	20080	-220.44	1212.02	992.58	-0.4854	0.4638	3.5558	-155
-150	0.01330	0.02538	0.01723	11920	11920	-219.85	1211.62	994.80	-0.4801	0.4630	3.5567	-150
-145	0.016850	0.03503	0.01724	6577	6577	-217.17	1211.17	997.00	-0.4743	0.4623	3.5575	-145
-140	0.04929	0.1003	0.01724	3864	3864	-215.49	1214.70	999.21	-0.4685	0.4615	3.5583	-140
-135	0.08380	0.1706	0.01725	2308	2308	-213.90	1215.22	1001.43	-0.4643	0.4613	3.5591	-135
-130	0.1463	0.2854	0.01725	1400	1400	-212.06	1215.71	1003.63	-0.4599	0.4611	3.5599	-130
-125	0.2311	0.4708	0.01726	862.2	862.2	-210.24	1216.16	1005.84	-0.4558	0.4609	3.5607	-125
-120	0.3757	0.7649	0.01728	538.6	538.6	-208.58	1216.63	1008.05	-0.4495	0.4615	3.5615	-120
-115	0.5019	1.228	0.01727	341.1	341.1	-206.79	1217.05	1010.26	-0.4433	0.4620	3.5623	-115
-110	0.6517	1.835	0.01728	218.9	218.9	-204.85	1217.45	1012.47	-0.4381	0.4618	3.5631	-110
-105	1.458	3.053	0.01728	142.7	142.7	-203.14	1217.83	1014.68	-0.4329	0.4623	3.5639	-105
-100	2.291	4.664	0.01729	93.53	93.53	-201.28	1218.17	1016.89	-0.4277	0.4627	3.5647	-100
-95	3.491	7.108	0.01729	62.32	62.32	-199.40	1218.50	1019.10	-0.4225	0.4631	3.5655	-95
-90	5.260	10.71	0.01730	41.86	41.86	-197.49	1218.80	1021.31	-0.4173	0.4635	3.5663	-90
-85	7.941	15.96	0.01730	28.46	28.46	-195.56	1219.08	1023.52	-0.4121	0.4639	3.5671	-85
-80	11.57	23.55	0.01731	19.55	19.55	-193.60	1219.33	1025.73	-0.4069	0.4643	3.5679	-80
-75	16.89	34.29	0.01732	13.56	13.56	-191.63	1219.56	1027.94	-0.4017	0.4647	3.5687	-75
-70	24.43	49.74	0.01733	9.501	9.501	-189.61	1219.76	1030.15	-0.3965	0.4651	3.5695	-70
-65	35.01	71.23	0.01733	6.715	6.715	-187.58	1219.94	1032.36	-0.3914	0.4655	3.5703	-65
-60	49.72	101.2	0.01734	4.788	4.788	-185.52	1220.10	1034.58	-0.3863	0.4659	3.5711	-60
-55	70.01	142.6	0.01734	3.443	3.443	-183.44	1220.23	1036.79	-0.3810	0.4663	3.5719	-55
-50	97.76	199.0	0.01735	2.496	2.496	-181.34	1220.34	1038.97	-0.3758	0.4667	3.5727	-50
-45	111.5	227.0	0.01736	2.000	2.000	-179.20	1220.37	1041.18	-0.3708	0.4671	3.5735	-45
-40	127.0	258.5	0.01738	1.941	1.941	-176.94	1220.40	1043.39	-0.3657	0.4675	3.5743	-40
-35	144.4	294.0	0.01738	1.915	1.915	-174.58	1220.43	1045.60	-0.3605	0.4679	3.5751	-35
-30	163.1	334.0	0.01738	1.916	1.916	-172.15	1220.45	1047.81	-0.3553	0.4683	3.5759	-30
-25	185.1	379.9	0.01738	1.943	1.943	-169.67	1220.46	1050.02	-0.3501	0.4687	3.5767	-25
-20	211.0	429.8	0.01737	1.191	1.191	-167.19	1220.49	1052.23	-0.3449	0.4691	3.5775	-20
-15	235.8	486.2	0.01737	1.057	1.057	-164.63	1220.51	1054.44	-0.3397	0.4695	3.5783	-15
-10	269.0	549.7	0.01737	0.8291	0.8291	-162.01	1220.52	1056.65	-0.3345	0.4699	3.5791	-10
-5	304.9	630.9	0.01738	0.6355	0.6355	-159.37	1220.53	1058.86	-0.3293	0.4703	3.5799	-5

* Compiled by John A. Goff and S. Gratch.

Table 3 Thermodynamic Properties of WATER at Saturation* (Continued)

Table 3-1. Thermodynamic Properties of Water and Steam												
Fahr. Temp. (°F)	Absolute Pressure P_s		Specific Volume, cu ft per lb			Enthalpy, Btu per lb			Entropy, Btu per (lb) (°F)			Fahr. Temp. (°F)
	Lb/Sq In.	In. Hg	Sat. Solid v_f	Evap. v_{fg}	Sat. Vapor v_g	Sat. Solid h_f	Evap. h_{fg}	Sat. Vapor h_g	Sat. Solid s_f	Evap. s_{fg}	Sat. Vapor s_g	
7	0.02653	0.05402	0.01743	10480	10480	-155.66	1219.84	1064.18	-0.3172	0.6138	2.9066	7
8	0.02771	0.05653	0.01743	9979	9979	-155.18	1219.80	1064.63	-0.3168	0.6135	2.9071	8
10	0.02925	0.05977	0.01744	9507	9507	-154.70	1219.76	1065.08	-0.3163	0.6132	2.9076	10
12	0.03067	0.06286	0.01744	9060	9060	-154.23	1219.73	1065.54	-0.3159	0.6129	2.9081	12
14	0.03208	0.06580	0.01744	8636	8636	-153.74	1219.68	1065.94	-0.3154	0.6126	2.9086	14
16	0.03348	0.06868	0.01744	8234	8234	-153.26	1219.64	1066.38	-0.3149	0.6123	2.9091	16
18	0.03487	0.07150	0.01744	7851	7851	-152.77	1219.59	1066.83	-0.3144	0.6120	2.9096	18
20	0.03625	0.07426	0.01744	7489	7489	-152.29	1219.55	1067.26	-0.3139	0.6117	2.9101	20
22	0.03762	0.07696	0.01744	7144	7144	-151.80	1219.50	1067.70	-0.3134	0.6114	2.9106	22
24	0.03898	0.07961	0.01744	6817	6817	-151.32	1219.46	1068.14	-0.3129	0.6111	2.9111	24
26	0.04033	0.08221	0.01745	6505	6505	-150.83	1219.41	1068.58	-0.3124	0.6108	2.9116	26
28	0.04167	0.08476	0.01745	6201	6201	-150.34	1219.36	1069.02	-0.3119	0.6105	2.9121	28
30	0.04299	0.08726	0.01745	5909	5909	-149.85	1219.31	1069.46	-0.3114	0.6102	2.9126	30
32	0.04430	0.08971	0.01745	5633	5633	-149.36	1219.26	1069.90	-0.3109	0.6099	2.9131	32
34	0.04560	0.09211	0.01745	5369	5369	-148.87	1219.21	1070.34	-0.3104	0.6096	2.9136	34
36	0.04689	0.09446	0.01745	5116	5116	-148.38	1219.16	1070.78	-0.3099	0.6093	2.9141	36
38	0.04817	0.09676	0.01745	4873	4873	-147.89	1219.11	1071.22	-0.3094	0.6090	2.9146	38
40	0.04944	0.09901	0.01745	4640	4640	-147.40	1219.06	1071.66	-0.3089	0.6087	2.9151	40
42	0.05070	0.10121	0.01745	4417	4417	-146.91	1219.01	1072.10	-0.3084	0.6084	2.9156	42
44	0.05195	0.10336	0.01745	4203	4203	-146.42	1218.96	1072.54	-0.3079	0.6081	2.9161	44
46	0.05319	0.10546	0.01745	3998	3998	-145.93	1218.91	1072.98	-0.3074	0.6078	2.9166	46
48	0.05442	0.10751	0.01745	3802	3802	-145.44	1218.86	1073.42	-0.3069	0.6075	2.9171	48
50	0.05564	0.10951	0.01745	3615	3615	-144.95	1218.81	1073.86	-0.3064	0.6072	2.9176	50
52	0.05686	0.11146	0.01745	3437	3437	-144.46	1218.76	1074.30	-0.3059	0.6069	2.9181	52
54	0.05807	0.11336	0.01745	3268	3268	-143.97	1218.71	1074.74	-0.3054	0.6066	2.9186	54
56	0.05927	0.11521	0.01745	3107	3107	-143.48	1218.66	1075.18	-0.3049	0.6063	2.9191	56
58	0.06046	0.11701	0.01745	2954	2954	-142.99	1218.61	1075.62	-0.3044	0.6060	2.9196	58
60	0.06164	0.11876	0.01745	2808	2808	-142.50	1218.56	1076.06	-0.3039	0.6057	2.9201	60
62	0.06281	0.12046	0.01745	2669	2669	-142.01	1218.51	1076.50	-0.3034	0.6054	2.9206	62
64	0.06397	0.12211	0.01745	2536	2536	-141.52	1218.46	1076.94	-0.3029	0.6051	2.9211	64
66	0.06512	0.12371	0.01745	2409	2409	-141.03	1218.41	1077.38	-0.3024	0.6048	2.9216	66
68	0.06626	0.12526	0.01745	2288	2288	-140.54	1218.36	1077.82	-0.3019	0.6045	2.9221	68
70	0.06739	0.12676	0.01745	2172	2172	-140.05	1218.31	1078.26	-0.3014	0.6042	2.9226	70
72	0.06851	0.12821	0.01745	2061	2061	-139.56	1218.26	1078.70	-0.3009	0.6039	2.9231	72
74	0.06962	0.12961	0.01745	1955	1955	-139.07	1218.21	1079.14	-0.3004	0.6036	2.9236	74
76	0.07072	0.13096	0.01745	1854	1854	-138.58	1218.16	1079.58	-0.3000	0.6033	2.9241	76
78	0.07181	0.13226	0.01745	1758	1758	-138.09	1218.11	1080.02	-0.2995	0.6030	2.9246	78
80	0.07289	0.13351	0.01745	1667	1667	-137.60	1218.06	1080.46	-0.2990	0.6027	2.9251	80
82	0.07396	0.13471	0.01745	1580	1580	-137.11	1218.01	1080.90	-0.2985	0.6024	2.9256	82
84	0.07502	0.13586	0.01745	1497	1497	-136.62	1217.96	1081.34	-0.2980	0.6021	2.9261	84
86	0.07607	0.13696	0.01745	1419	1419	-136.13	1217.91	1081.78	-0.2975	0.6018	2.9266	86
88	0.07711	0.13801	0.01745	1345	1345	-135.64	1217.86	1082.22	-0.2970	0.6015	2.9271	88
90	0.07814	0.13901	0.01745	1275	1275	-135.15	1217.81	1082.66	-0.2965	0.6012	2.9276	90
92	0.07916	0.14001	0.01745	1209	1209	-134.66	1217.76	1083.10	-0.2960	0.6009	2.9281	92
94	0.08017	0.14096	0.01745	1147	1147	-134.17	1217.71	1083.54	-0.2955	0.6006	2.9286	94
96	0.08117	0.14186	0.01745	1089	1089	-133.68	1217.66	1083.98	-0.2950	0.6003	2.9291	96
98	0.08216	0.14271	0.01745	1035	1035	-133.19	1217.61	1084.42	-0.2945	0.6000	2.9296	98
100	0.08314	0.14351	0.01745	984	984	-132.70	1217.56	1084.86	-0.2940	0.5997	2.9301	100