

Table 2 Thermodynamic Properties of WATER at Saturation* (Continued)

Fahr. Temp. (°F)	Absolute Pressure p		Specific Volume, cu ft per lb			Enthalpy, Btu per lb			Entropy, Btu per (lb) (°F)			Fahr. Temp. (°F)
	Lb/Sq In.	In. Hg	Sat. Liquid v_f	Evap. v_{fg}	Sat. Vapor v_g	Sat. Liquid h_f	Evap. h_{fg}	Sat. Vapor h_g	Sat. Liquid s_f	Evap. s_{fg}	Sat. Vapor s_g	
7	0.02553	0.05402	0.01743	10490	10490	-155.06	1219.84	1064.18	-0.3173	2.6133	2.2960	7
8	0.02771	0.05832	0.01743	9979	9979	-155.18	1219.80	1064.62	-0.3182	2.6081	2.2919	8
9	0.02938	0.06277	0.01744	9507	9507	-154.70	1219.78	1065.06	-0.3193	2.6002	2.2878	9
10	0.03067	0.06638	0.01744	9060	9060	-154.23	1219.73	1065.50	-0.3203	2.5923	2.2837	10
11	0.03166	0.06926	0.01744	8636	8636	-153.74	1219.68	1065.94	-0.3213	2.5843	2.2791	11
12	0.03244	0.07184	0.01744	8234	8234	-153.26	1219.64	1066.38	-0.3223	2.5763	2.2745	12
13	0.03303	0.07420	0.01744	7851	7851	-152.77	1219.59	1066.82	-0.3233	2.5683	2.2699	13
14	0.03347	0.07636	0.01744	7489	7489	-152.28	1219.54	1067.26	-0.3243	2.5603	2.2653	14
15	0.03378	0.07833	0.01744	7144	7144	-151.79	1219.49	1067.70	-0.3253	2.5523	2.2607	15
16	0.03397	0.08012	0.01744	6817	6817	-151.30	1219.44	1068.14	-0.3263	2.5443	2.2561	16
17	0.03406	0.08174	0.01744	6500	6500	-150.81	1219.39	1068.58	-0.3273	2.5363	2.2515	17
18	0.03406	0.08329	0.01744	6201	6201	-150.32	1219.34	1069.02	-0.3283	2.5283	2.2469	18
19	0.03397	0.08478	0.01744	5917	5917	-149.83	1219.29	1069.46	-0.3293	2.5203	2.2423	19
20	0.03380	0.08620	0.01744	5647	5647	-149.34	1219.24	1069.90	-0.3303	2.5123	2.2377	20
21	0.03355	0.08756	0.01744	5391	5391	-148.85	1219.19	1070.34	-0.3313	2.5043	2.2331	21
22	0.03323	0.08887	0.01744	5148	5148	-148.36	1219.14	1070.78	-0.3323	2.4963	2.2285	22
23	0.03284	0.09013	0.01744	4917	4917	-147.87	1219.09	1071.22	-0.3333	2.4883	2.2239	23
24	0.03240	0.09135	0.01744	4697	4697	-147.38	1219.04	1071.66	-0.3343	2.4803	2.2193	24
25	0.03191	0.09252	0.01744	4488	4488	-146.89	1218.99	1072.10	-0.3353	2.4723	2.2147	25
26	0.03138	0.09365	0.01744	4290	4290	-146.40	1218.94	1072.54	-0.3363	2.4643	2.2101	26
27	0.03081	0.09474	0.01744	4103	4103	-145.91	1218.89	1072.98	-0.3373	2.4563	2.2055	27
28	0.03020	0.09578	0.01744	3927	3927	-145.42	1218.84	1073.42	-0.3383	2.4483	2.2009	28
29	0.02956	0.09678	0.01744	3762	3762	-144.93	1218.79	1073.86	-0.3393	2.4403	2.1963	29
30	0.02889	0.09774	0.01744	3607	3607	-144.44	1218.74	1074.30	-0.3403	2.4323	2.1917	30
31	0.02819	0.09866	0.01747	3453	3453	-143.95	1218.69	1074.74	-0.3413	2.4243	2.1871	31
32	0.02746	0.09954	0.01747	3306	3306	-143.46	1218.64	1075.18	-0.3423	2.4163	2.1825	32
33	0.02671	0.10038	0.01702	3204	3204	0.00	1218.60	1075.16	-0.3400	2.4167	2.1807	33

Fahr. Temp. (°F)	Absolute Pressure p_a		Specific Volume, cu ft per lb			Enthalpy, Btu per lb			Entropy, Btu per (lb) (°F)			Fahr. Temp. (°F)
	Lb./Sq. In.	In. Hg	Sat. Liquid $v_{f, \text{ liquid}}$	Evap. v_{fg}	Sat. Vapor v_g	Sat. Liquid h_f	Evap. h_{fg}	Sat. Vapor h_g	Sat. Liquid s_f	Evap. s_{fg}	Sat. Vapor s_g	
34	0.02527	0.1878	0.01603	3180.5	3180.5	1.01	1074.56	1073.80	0.00005	3.1811	3.1831	34
35	0.02509	0.18848	0.01603	3061.7	3061.7	1.01	1074.03	1074.04	0.00049	3.1755	3.1796	35
36	0.02489	0.18913	0.01603	2947.8	2947.8	1.01	1073.46	1074.48	0.00091	3.1700	3.1781	36
37	0.02468	0.18980	0.01603	2838.7	2838.7	1.01	1072.83	1075.92	0.00135	3.1644	3.1726	37
38	0.02445	0.19048	0.01603	2734.1	2734.1	1.01	1072.17	1077.00	0.00180	3.1588	3.1670	38
39	0.02421	0.19118	0.01603	2633.8	2633.8	1.01	1071.53	1077.80	0.00225	3.1533	3.1617	39
40	0.02396	0.19189	0.01603	2536.7	2536.7	1.01	1070.90	1078.50	0.00270	3.1478	3.1562	40
41	0.02371	0.19261	0.01603	2442.8	2442.8	1.01	1070.29	1079.15	0.00315	3.1423	3.1507	41
42	0.02345	0.19334	0.01603	2352.0	2352.0	1.01	1069.69	1079.75	0.00360	3.1368	3.1452	42
43	0.02319	0.19407	0.01603	2263.4	2263.4	1.01	1069.10	1080.35	0.00405	3.1313	3.1397	43
44	0.02292	0.19480	0.01603	2177.0	2177.0	1.01	1068.52	1080.95	0.00450	3.1258	3.1342	44
45	0.02265	0.19553	0.01603	2092.7	2092.7	1.01	1067.95	1081.55	0.00495	3.1203	3.1287	45
46	0.02238	0.19626	0.01603	2010.5	2010.5	1.01	1067.38	1082.15	0.00540	3.1148	3.1232	46
47	0.02211	0.19699	0.01603	1930.4	1930.4	1.01	1066.82	1082.75	0.00585	3.1093	3.1177	47
48	0.02184	0.19772	0.01603	1852.4	1852.4	1.01	1066.26	1083.35	0.00630	3.1038	3.1122	48
49	0.02157	0.19845	0.01603	1776.5	1776.5	1.01	1065.70	1083.95	0.00675	3.0983	3.1067	49
50	0.02130	0.19918	0.01603	1702.7	1702.7	1.01	1065.14	1084.55	0.00720	3.0928	3.1012	50
51	0.02103	0.19991	0.01603	1631.0	1631.0	1.01	1064.58	1085.15	0.00765	3.0873	3.0957	51
52	0.02076	0.20064	0.01603	1561.4	1561.4	1.01	1064.02	1085.75	0.00810	3.0818	3.0902	52
53	0.02049	0.20137	0.01603	1493.8	1493.8	1.01	1063.46	1086.35	0.00855	3.0763	3.0847	53
54	0.02022	0.20210	0.01603	1428.2	1428.2	1.01	1062.90	1086.95	0.00900	3.0708	3.0792	54
55	0.01995	0.20283	0.01603	1364.6	1364.6	1.01	1062.34	1087.55	0.00945	3.0653	3.0737	55
56	0.01968	0.20356	0.01603	1303.0	1303.0	1.01	1061.78	1088.15	0.00990	3.0598	3.0682	56
57	0.01941	0.20429	0.01603	1243.4	1243.4	1.01	1061.22	1088.75	0.01035	3.0543	3.0627	57
58	0.01914	0.20502	0.01603	1185.7	1185.7	1.01	1060.66	1089.35	0.01080	3.0488	3.0572	58
59	0.01887	0.20575	0.01603	1130.0	1130.0	1.01	1060.10	1089.95	0.01125	3.0433	3.0517	59
60	0.01860	0.20648	0.01603	1076.2	1076.2	1.01	1059.54	1090.55	0.01170	3.0378	3.0462	60
61	0.01833	0.20721	0.01603	1024.4	1024.4	1.01	1058.98	1091.15	0.01215	3.0323	3.0407	61
62	0.01806	0.20794	0.01603	974.5	974.5	1.01	1058.42	1091.75	0.01260	3.0268	3.0352	62
63	0.01779	0.20867	0.01603	926.6	926.6	1.01	1057.86	1092.35	0.01305	3.0213	3.0297	63
64	0.01752	0.20940	0.01603	880.6	880.6	1.01	1057.30	1092.95	0.01350	3.0158	3.0242	64
65	0.01725	0.21013	0.01603	836.5	836.5	1.01	1056.74	1093.55	0.01395	3.0103	3.0187	65
66	0.01698	0.21086	0.01603	794.3	794.3	1.01	1056.18	1094.15	0.01440	3.0048	3.0132	66
67	0.01671	0.21159	0.01603	753.9	753.9	1.01	1055.62	1094.75	0.01485	2.9993	3.0077	67
68	0.01644	0.21232	0.01603	715.3	715.3	1.01	1055.06	1095.35	0.01530	2.9938	3.0022	68
69	0.01617	0.21305	0.01603	678.5	678.5	1.01	1054.50	1095.95	0.01575	2.9883	2.9967	69
70	0.01590	0.21378	0.01603	643.5	643.5	1.01	1053.94	1096.55	0.01620	2.9828	2.9912	70
71	0.01563	0.21451	0.01603	610.2	610.2	1.01	1053.38	1097.15	0.01665	2.9773	2.9857	71

* Compiled by John A. Goff and S. Gratch.
* Extrapolated to represent metastable equilibrium with undercooled liquid.

Table 2 Thermodynamic Properties of WATER at Saturation* (Continued)

Fahr. Temp. (°F)	Absolute Pressure p		Specific Volume, cu ft per lb				Enthalpy, Btu per lb				Entropy, Btu per (lb) (°F)				Fahr. Temp. (°F)
	Lb/Sq In.	In. Hg	Sat. Liquid v _f	Evap. v _{fg}	Sat. Vapor v _g	Sat. Liquid h _f	Evap. h _{fg}	Sat. Vapor h _g	Sat. Liquid s _f	Evap. s _{fg}	Sat. Vapor s _g				
72	0.00000	0.12046	0.01744	1260	1260	-123.86	1216.64	1092.78	-0.3823	2.0963	1.9985	72			
73	0.00000	0.12076	0.01744	1241	1241	-123.37	1216.59	1093.22	-0.3833	2.0883	1.9939	73			
74	0.00000	0.12106	0.01744	1222	1222	-122.88	1216.54	1093.66	-0.3843	2.0803	1.9893	74			
75	0.00000	0.12135	0.01744	1204	1204	-122.39	1216.49	1094.10	-0.3853	2.0723	1.9847	75			
76	0.00000	0.12164	0.01744	1186	1186	-121.90	1216.44	1094.54	-0.3863	2.0643	1.9801	76			
77	0.00000	0.12192	0.01744	1169	1169	-121.41	1216.39	1094.98	-0.3873	2.0563	1.9755	77			
78	0.00000	0.12220	0.01744	1152	1152	-120.92	1216.34	1095.42	-0.3883	2.0483	1.9709	78			
79	0.00000	0.12248	0.01744	1135	1135	-120.43	1216.29	1095.86	-0.3893	2.0403	1.9663	79			
80	0.00000	0.12275	0.01744	1118	1118	-119.94	1216.24	1096.30	-0.3903	2.0323	1.9619	80			
81	0.00000	0.12302	0.01744	1101	1101	-119.45	1216.19	1096.74	-0.3913	2.0243	1.9575	81			
82	0.00000	0.12329	0.01744	1084	1084	-118.96	1216.14	1097.18	-0.3923	2.0163	1.9531	82			
83	0.00000	0.12356	0.01744	1067	1067	-118.47	1216.09	1097.62	-0.3933	2.0083	1.9487	83			
84	0.00000	0.12382	0.01744	1050	1050	-117.98	1216.04	1098.06	-0.3943	2.0003	1.9443	84			
85	0.00000	0.12408	0.01744	1033	1033	-117.49	1215.99	1098.50	-0.3953	1.9923	1.9399	85			
86	0.00000	0.12434	0.01744	1016	1016	-117.00	1215.94	1098.94	-0.3963	1.9843	1.9355	86			
87	0.00000	0.12460	0.01744	999	999	-116.51	1215.89	1099.38	-0.3973	1.9763	1.9311	87			
88	0.00000	0.12486	0.01744	982	982	-116.02	1215.84	1099.82	-0.3983	1.9683	1.9267	88			
89	0.00000	0.12512	0.01744	965	965	-115.53	1215.79	1100.26	-0.3993	1.9603	1.9223	89			
90	0.00000	0.12538	0.01744	948	948	-115.04	1215.74	1100.70	-0.4003	1.9523	1.9179	90			
91	0.00000	0.12564	0.01744	931	931	-114.55	1215.69	1101.14	-0.4013	1.9443	1.9135	91			
92	0.00000	0.12590	0.01744	914	914	-114.06	1215.64	1101.58	-0.4023	1.9363	1.9091	92			
93	0.00000	0.12616	0.01744	897	897	-113.57	1215.59	1102.02	-0.4033	1.9283	1.9047	93			
94	0.00000	0.12642	0.01744	880	880	-113.08	1215.54	1102.46	-0.4043	1.9203	1.9003	94			
95	0.00000	0.12668	0.01744	863	863	-112.59	1215.49	1102.90	-0.4053	1.9123	1.8959	95			
96	0.00000	0.12694	0.01744	846	846	-112.10	1215.44	1103.34	-0.4063	1.9043	1.8915	96			
97	0.00000	0.12720	0.01744	829	829	-111.61	1215.39	1103.78	-0.4073	1.8963	1.8871	97			
98	0.00000	0.12746	0.01744	812	812	-111.12	1215.34	1104.22	-0.4083	1.8883	1.8827	98			
99	0.00000	0.12772	0.01744	795	795	-110.63	1215.29	1104.66	-0.4093	1.8803	1.8783	99			
100	0.00000	0.12798	0.01744	778	778	-110.14	1215.24	1105.10	-0.4103	1.8723	1.8739	100			
101	0.00000	0.12824	0.01744	761	761	-109.65	1215.19	1105.54	-0.4113	1.8643	1.8695	101			
102	0.00000	0.12850	0.01744	744	744	-109.16	1215.14	1105.98	-0.4123	1.8563	1.8651	102			
103	0.00000	0.12876	0.01744	727	727	-108.67	1215.09	1106.42	-0.4133	1.8483	1.8607	103			
104	0.00000	0.12902	0.01744	710	710	-108.18	1215.04	1106.86	-0.4143	1.8403	1.8563	104			
105	0.00000	0.12928	0.01744	693	693	-107.69	1214.99	1107.30	-0.4153	1.8323	1.8519	105			
106	0.00000	0.12954	0.01744	676	676	-107.20	1214.94	1107.74	-0.4163	1.8243	1.8475	106			
107	0.00000	0.12980	0.01744	659	659	-106.71	1214.89	1108.18	-0.4173	1.8163	1.8431	107			
108	0.00000	0.13006	0.01744	642	642	-106.22	1214.84	1108.62	-0.4183	1.8083	1.8387	108			
109	0.00000	0.13032	0.01744	625	625	-105.73	1214.79	1109.06	-0.4193	1.8003	1.8343	109			
110	0.00000	0.13058	0.01744	608	608	-105.24	1214.74	1109.50	-0.4203	1.7923	1.8299	110			
111	0.00000	0.13084	0.01744	591	591	-104.75	1214.69	1109.94	-0.4213	1.7843	1.8255	111			
112	0.00000	0.13110	0.01744	574	574	-104.26	1214.64	1110.38	-0.4223	1.7763	1.8211	112			
113	0.00000	0.13136	0.01744	557	557	-103.77	1214.59	1110.82	-0.4233	1.7683	1.8167	113			
114	0.00000	0.13162	0.01744	540	540	-103.28	1214.54	1111.26	-0.4243	1.7603	1.8123	114			
115	0.00000	0.13188	0.01744	523	523	-102.79	1214.49	1111.70	-0.4253	1.7523	1.8079	115			
116	0.00000	0.13214	0.01744	506	506	-102.30	1214.44	1112.14	-0.4263	1.7443	1.8035	116			
117	0.00000	0.13240	0.01744	489	489	-101.81	1214.39	1112.58	-0.4273	1.7363	1.7991	117			
118	0.00000	0.13266	0.01744	472	472	-101.32	1214.34	1113.02	-0.4283	1.7283	1.7947	118			
119	0.00000	0.13292	0.01744	455	455	-100.83	1214.29	1113.46	-0.4293	1.7203	1.7903	119			
120	0.00000	0.13318	0.01744	438	438	-100.34	1214.24	1113.90	-0.4303	1.7123	1.7859	120			
121	0.00000	0.13344	0.01744	421	421	-99.85	1214.19	1114.34	-0.4313	1.7043	1.7815	121			
122	0.00000	0.13370	0.01744	404	404	-99.36	1214.14	1114.78	-0.4323	1.6963	1.7771	122			
123	0.00000	0.13396	0.01744	387	387	-98.87	1214.09	1115.22	-0.4333	1.6883	1.7727	123			
124	0.00000	0.13422	0.01744	370	370	-98.38	1214.04	1115.66	-0.4343	1.6803	1.7683	124			
125	0.00000	0.13448	0.01744	353	353	-97.89	1213.99	1116.10	-0.4353	1.6723	1.7639	125			
126	0.00000	0.13474	0.01744	336	336	-97.40	1213.94	1116.54	-0.4363	1.6643	1.7595	126			
127	0.00000	0.13500	0.01744	319	319	-96.91	1213.89	1116.98	-0.4373	1.6563	1.7551	127			
128	0.00000	0.13526	0.01744	302	302	-96.42	1213.84	1117.42	-0.4383	1.6483	1.7507	128			
129	0.00000	0.13552	0.01744	285	285	-95.93	1213.79	1117.86	-0.4393	1.6403	1.7463	129			
130	0.00000	0.13578	0.01744	268	268	-95.44	1213.74	1118.30	-0.4403	1.6323	1.7419	130			
131	0.00000	0.13604	0.01744	251	251	-94.95	1213.69	1118.74	-0.4413	1.6243	1.7375	131			
132	0.00000	0.13630	0.01744	234	234	-94.46	1213.64	1119.18	-0.4423	1.6163	1.7331	132			
133	0.00000	0.13656	0.01744	217	217	-93.97	1213.59	1119.62	-0.4433	1.6083	1.7287	133			
134	0.00000	0.13682	0.01744	200	200	-93.48	1213.54	1120.06	-0.4443	1.6003	1.7243	134			
135	0.00000	0.13708	0.01744	183	183	-92.99	1213.49	1120.50	-0.4453	1.5923	1.7199	135			
136	0.00000	0.13734	0.01744	166	166	-92.50	1213.44	1120.94	-0.4463	1.5843	1.7155	136			
137	0.00000	0.13760	0.01744	149	149	-92.01	1213.39	1121.38	-0.4473	1.5763	1.7111	137			
138	0.00000	0.13786	0.01744	132	132	-91.52	1213.34	1121.82	-0.4483	1.5683	1.7067	138			
139	0.00000	0.13812	0.01744	115	115	-91.03	1213.29	1122.26	-0.4493	1.5603	1.7023	139			
140	0.00000	0.13838	0.01744	98	98	-90.54	1213.24	1122.70	-0.4503	1.5523	1.6979	140			
141	0.00000	0.13864	0.01744	81	81	-90.05	1213.19	1123.14	-0.4513	1.5443	1.6935	141			
142	0.00000	0.13890	0.01744	64	64	-89.56	1213.14	1123.58	-0.4523	1.5363	1.6891	142			
143	0.00000	0.13916	0.01744	47	47	-89.07	1213.09	1124.02	-0.4533	1.5283	1.6847	143			
144	0.00000	0.13942	0.01744	30	30	-88.58	1213.04	1124.46	-0.4543	1.5203	1.6803	144			