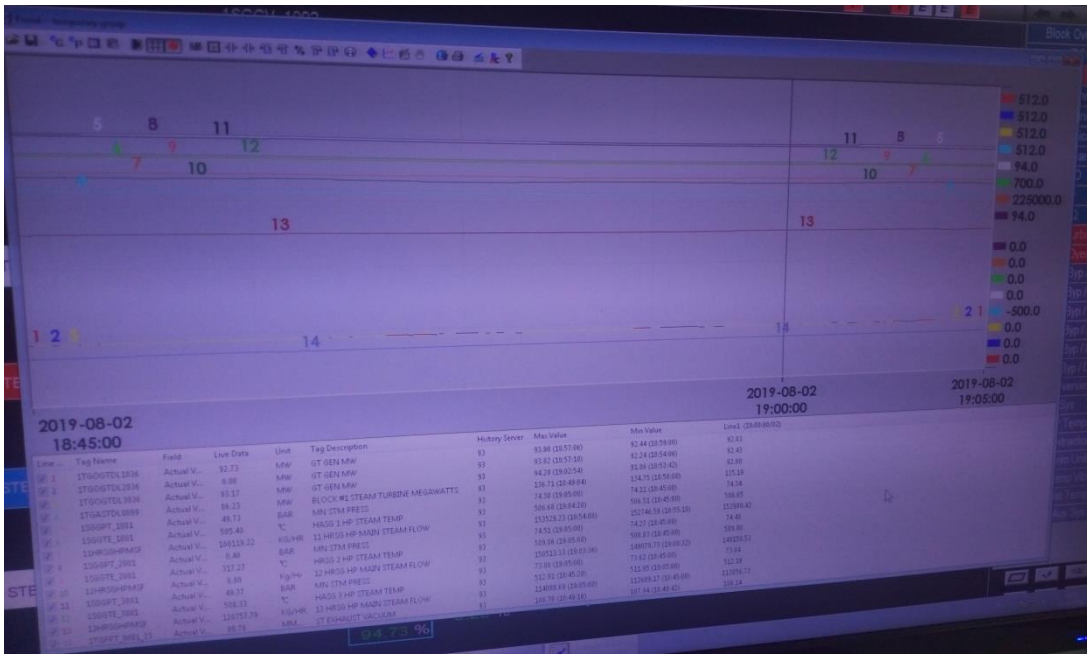
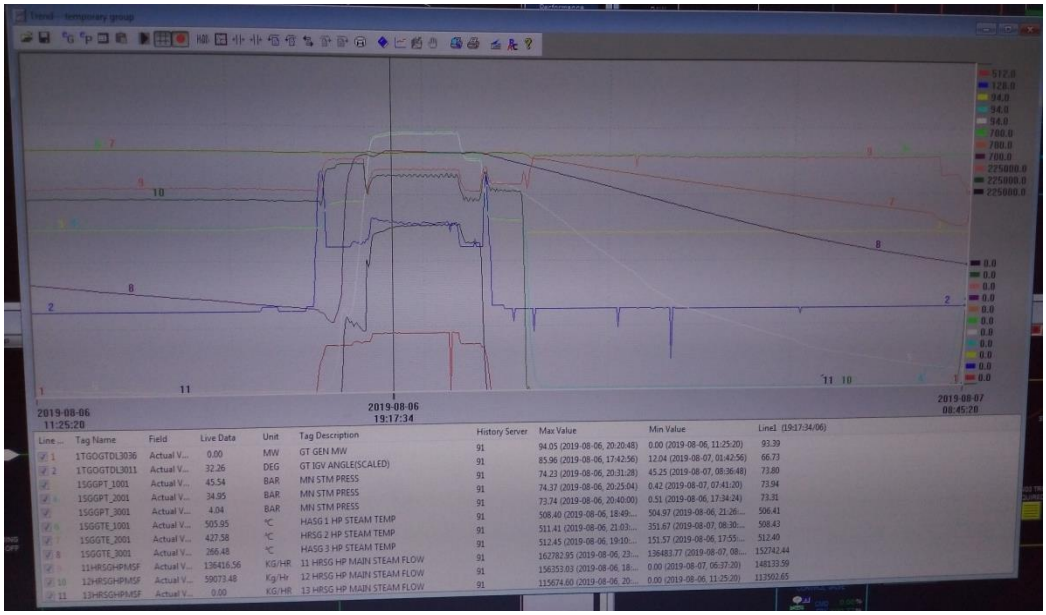
LAMPIRAN

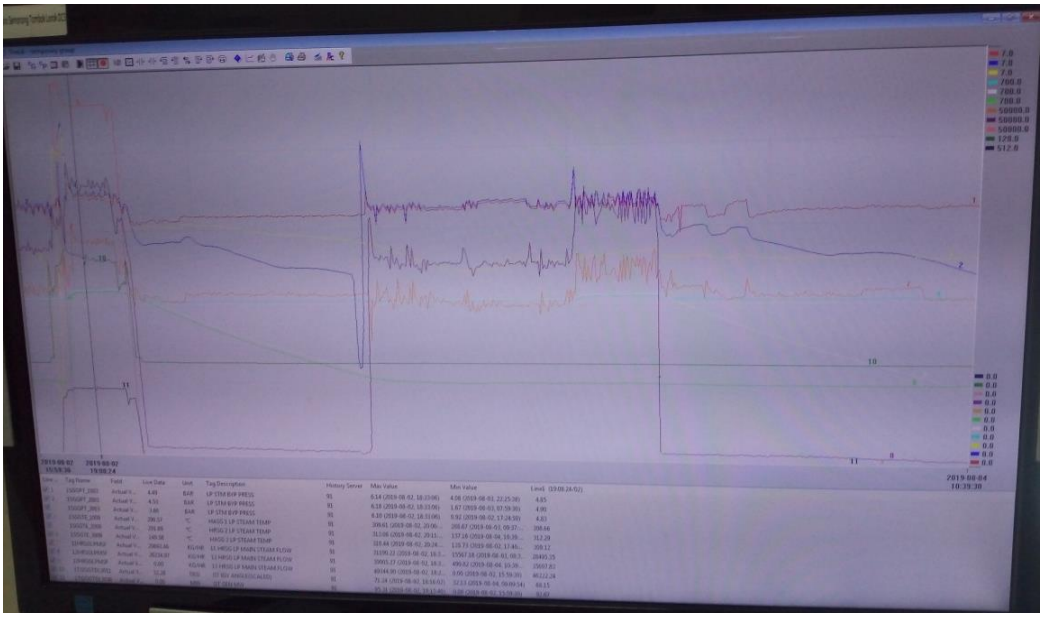


Lampiran 1. Data HP Turbin pada tanggal 02/08/2019 pukul 19:00 WIB

Lampiran 2. Data HP Turbin pada tanggal 05/08/2019 pukul 19:03 WIB

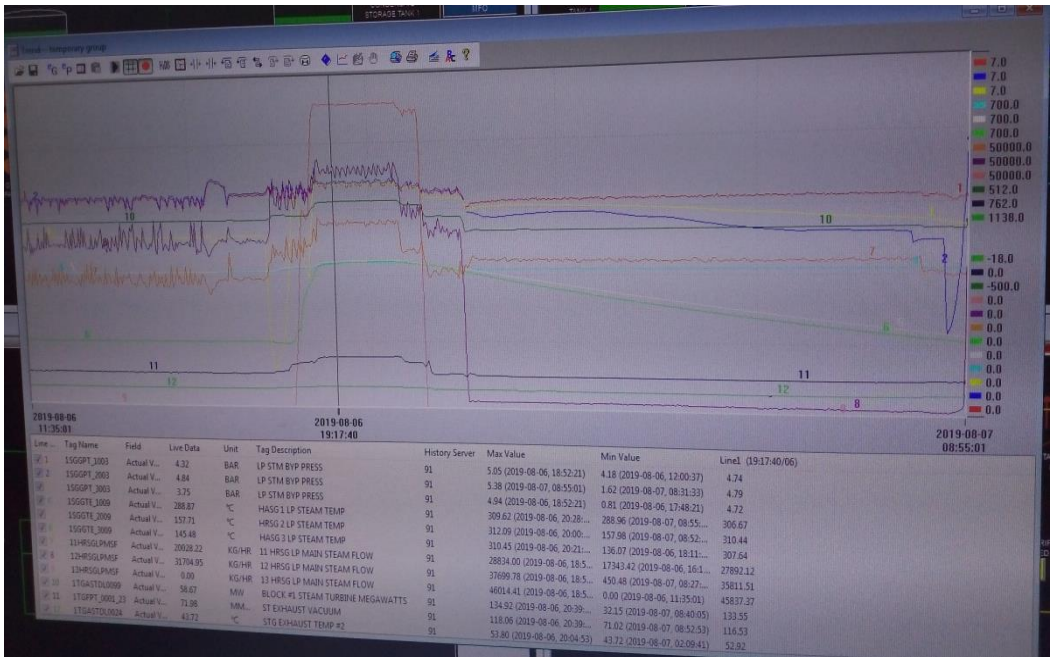


Lampiran 3. Data HP Turbin pada tanggal 06/08/2019 pukul 19:17 WIB

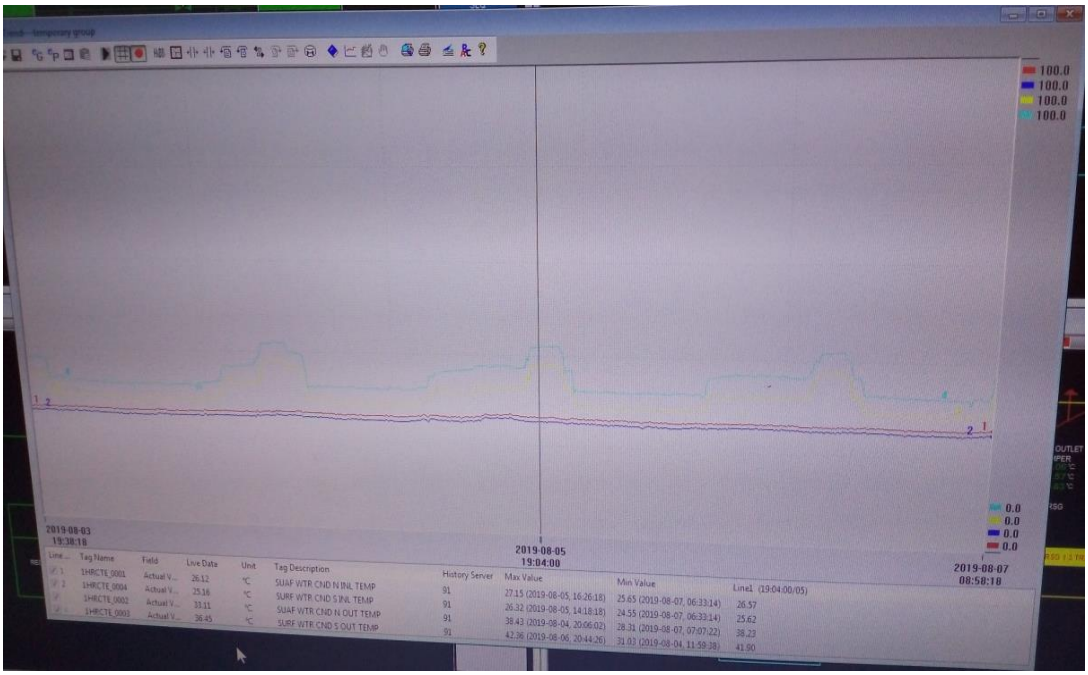


Lampiran 4. Data LP Turbin pada tanggal 02/08/2019 pukul 19:08 WIB

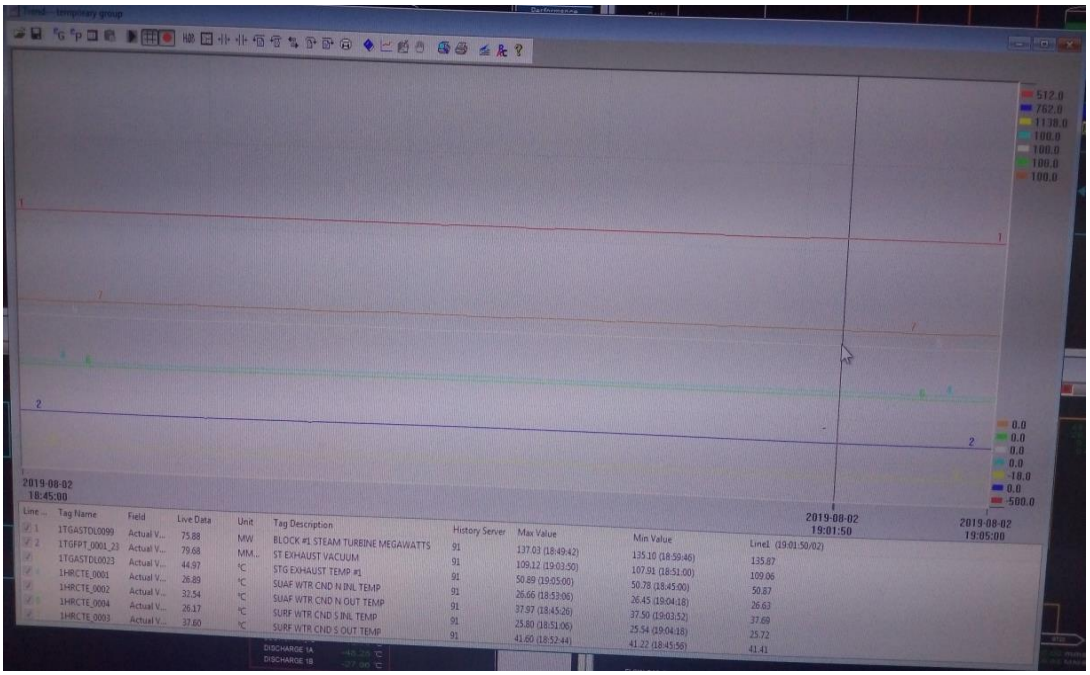
Lampiran 5. Data LP Turbin pada tanggal 05/08/19 pukul 19:04 WIB



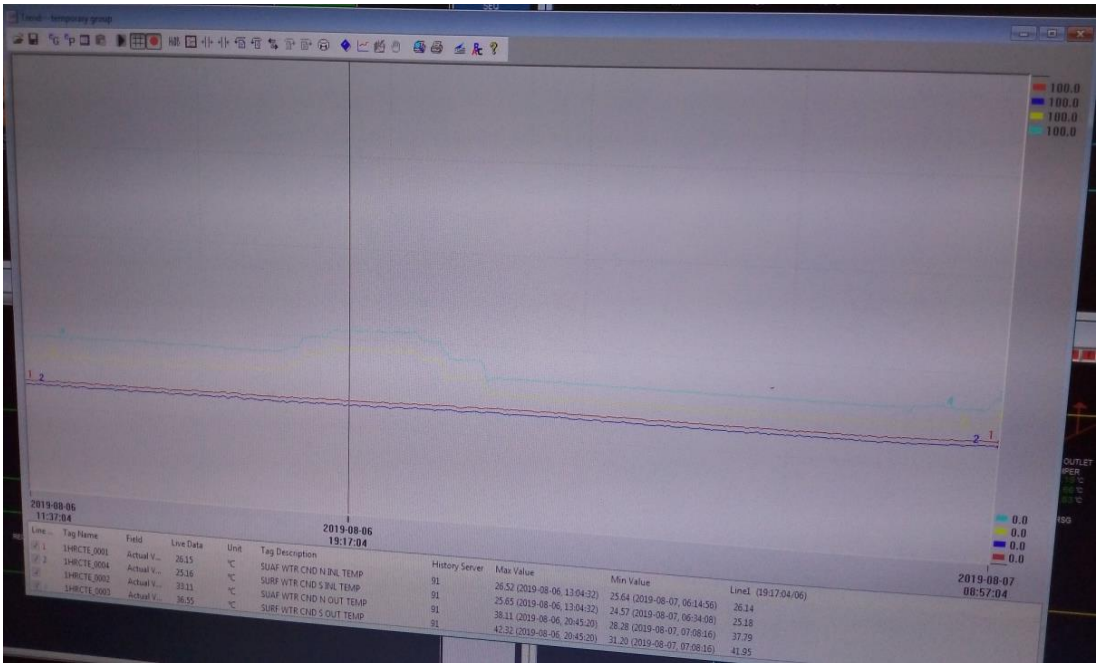
Lampiran 6. Data LP Turbin pada tanggal 06/08/19 pukul 19:17 WIB



Lampiran 7. *Load* STG 1.0 pada tanggal 2/08/2019



Lampiran 8. *Load* STG 1.0 pada tanggal 5/08/2019



Lampiran 9. *Load* STG 1.0 pada tanggal 6/08/2019

TABLE B.1 Saturated Water: Temperature Table

T °C	P kPa, MPa	$\hat{v}_l$ m³/kg	$\hat{v}_v$ m³/kg	$\hat{u}_l$ kJ/kg	$\Delta\hat{u}_{lv}$ kJ/kg	$\hat{u}_v$ kJ/kg	$\hat{h}_l$ kJ/kg	$\Delta\hat{h}_{lv}$ kJ/kg	$\hat{h}_v$ kJ/kg	$\hat{s}_l$ kJ/kg K	$\Delta\hat{s}_{lv}$ kJ/kg K	$\hat{s}_v$ kJ/kg K
0.01	0.6113	0.001000	206.132	0.00	2375.3	2375.3	0.00	2501.3	2501.3	0.0000	9.1562	9.1562
5	0.8721	0.001000	147.118	20.97	2361.3	2382.2	20.98	2489.6	2510.5	0.0761	8.9496	9.0257
10	1.2276	0.001000	106.377	41.99	2347.2	2389.2	41.99	2477.7	2519.7	0.1510	8.7498	8.9007
15	1.7051	0.001001	77.925	62.98	2333.1	2396.0	62.98	2465.9	2528.9	0.2245	8.5569	8.7813
20	2.3385	0.001002	57.790	83.94	2319.0	2402.9	83.94	2454.1	2538.1	0.2966	8.3706	8.6671
25	3.1691	0.001003	43.359	104.86	2304.9	2409.8	104.87	2442.3	2547.2	0.3673	8.1905	8.5579
30	4.2461	0.001004	32.893	125.77	2290.8	2416.6	125.77	2430.5	2556.2	0.4369	8.0164	8.4533
35	5.6280	0.001006	25.216	146.65	2276.7	2423.4	146.66	2418.6	2565.3	0.5052	7.8478	8.3530
40	7.3837	0.001008	19.523	167.53	2262.6	2430.1	167.54	2406.7	2574.3	0.5724	7.6845	8.2569
45	9.5934	0.001010	15.258	188.41	2248.4	2436.8	188.42	2394.8	2583.2	0.6386	7.5261	8.1647
50	12.350	0.001012	12.032	209.30	2234.2	2443.5	209.31	2382.7	2592.1	0.7037	7.3725	8.0762
55	15.758	0.001015	9.568	230.19	2219.9	2450.1	230.20	2370.7	2600.9	0.7679	7.2234	7.9912
60	19.941	0.001017	7.671	251.09	2205.5	2456.6	251.11	2358.5	2609.6	0.8311	7.0784	7.9095
65	25.033	0.001020	6.197	272.00	2191.1	2463.1	272.03	2346.2	2618.2	0.8934	6.9375	7.8309
70	31.188	0.001023	5.042	292.93	2176.6	2469.5	292.96	2333.8	2626.8	0.9548	6.8004	7.7552
75	38.578	0.001026	4.131	313.87	2162.0	2475.9	313.91	2321.4	2635.3	1.0154	6.6670	7.6824
80	47.390	0.001029	3.407	334.84	2147.4	2482.2	334.88	2308.8	2643.7	1.0752	6.5369	7.6121
85	57.834	0.001032	2.828	355.82	2132.6	2488.4	355.88	2296.0	2651.9	1.1342	6.4102	7.5444
90	70.139	0.001036	2.361	376.82	2117.7	2494.5	376.90	2283.2	2660.1	1.1924	6.2866	7.4790
95	84.554	0.001040	1.982	397.86	2102.7	2500.6	397.94	2270.2	2668.1	1.2500	6.1659	7.4158
100	0.10135	0.001044	1.6729	418.91	2087.6	2506.5	419.02	2257.0	2676.0	1.3068	6.0480	7.3548
105	0.12082	0.001047	1.4194	440.00	2072.3	2512.3	440.13	2243.7	2683.8	1.3629	5.9328	7.2958
110	0.14328	0.001052	1.2102	461.12	2057.0	2518.1	461.27	2230.2	2691.5	1.4184	5.8202	7.2386
115	0.16906	0.001056	1.0366	482.28	2041.4	2523.7	482.46	2216.5	2699.0	1.4733	5.7100	7.1832
120	0.19853	0.001060	0.8919	503.48	2025.8	2529.2	503.69	2202.6	2706.3	1.5275	5.6020	7.1295
125	0.2321	0.001065	0.77059	524.72	2009.9	2534.6	524.96	2188.5	2713.5	1.5812	5.4962	7.0774
130	0.2701	0.001070	0.66850	546.00	1993.9	2539.9	546.29	2174.2	2720.5	1.6343	5.3925	7.0269
135	0.3130	0.001075	0.58217	567.34	1977.7	2545.0	567.67	2159.6	2727.3	1.6869	5.2907	6.9777
140	0.3613	0.001080	0.50885	588.72	1961.3	2550.0	589.11	2144.8	2733.9	1.7390	5.1908	6.9298
145	0.4154	0.001085	0.44632	610.16	1944.7	2554.9	610.61	2129.6	2740.3	1.7906	5.0926	6.8832
150	0.4759	0.001090	0.39278	631.66	1927.9	2559.5	632.18	2114.3	2746.4	1.8417	4.9960	6.8378
155	0.5431	0.001096	0.34676	653.23	1910.8	2564.0	653.82	2098.6	2752.4	1.8924	4.9010	6.7934
160	0.6178	0.001102	0.30706	674.85	1893.5	2568.4	675.53	2082.6	2758.1	1.9426	4.8075	6.7501
165	0.7005	0.001108	0.27269	696.55	1876.0	2572.5	697.32	2066.2	2763.5	1.9924	4.7153	6.7078
170	0.7917	0.001114	0.24283	718.31	1858.1	2576.5	719.20	2049.5	2768.7	2.0418	4.6244	6.6663

TABLE B.1 Continued

175	0.8920	0.001121	0.21680	740.16	1840.0	2580.2	741.16	2032.4	2773.6	2.0909	4.5347	6.6256
180	1.0022	0.001127	0.19405	762.08	1821.6	2583.7	763.21	2015.0	2778.2	2.1395	4.4461	6.5857
185	1.1227	0.001134	0.17409	784.08	1802.9	2587.0	785.36	1997.1	2782.4	2.1878	4.3586	6.5464
190	1.2544	0.001141	0.15654	806.17	1783.8	2590.0	807.61	1978.8	2786.4	2.2358	4.2720	6.5078
195	1.3978	0.001149	0.14105	828.36	1764.4	2592.8	829.96	1960.0	2790.0	2.2835	4.1863	6.4697
200	1.5538	0.001156	0.12736	850.64	1744.7	2595.3	852.43	1940.7	2793.2	2.3308	4.1014	6.4322
205	1.7230	0.001164	0.11521	873.02	1724.5	2597.5	875.03	1921.0	2796.0	2.3779	4.0172	6.3951
210	1.9063	0.001173	0.10441	895.51	1703.9	2599.4	897.75	1900.7	2798.5	2.4247	3.9337	6.3584
215	2.1042	0.001181	0.09479	918.12	1682.9	2601.1	920.61	1879.9	2800.5	2.4713	3.8507	6.3221
220	2.3178	0.001190	0.08619	940.85	1661.5	2602.3	943.61	1858.5	2802.1	2.5177	3.7683	6.2860
225	2.5477	0.001199	0.07849	963.72	1639.6	2603.3	966.77	1836.5	2803.3	2.5639	3.6863	6.2502
230	2.7949	0.001209	0.07158	986.72	1617.2	2603.9	990.10	1813.8	2803.9	2.6099	3.6047	6.2146
235	3.0601	0.001219	0.06536	1009.88	1594.2	2604.1	1013.61	1790.5	2804.1	2.6557	3.5233	6.1791
240	3.3442	0.001229	0.05976	1033.19	1570.8	2603.9	1037.31	1766.5	2803.8	2.7015	3.4422	6.1436
245	3.6482	0.001240	0.05470	1056.69	1546.7	2603.4	1061.21	1741.7	2802.9	2.7471	3.3612	6.1083
250	3.9730	0.001251	0.05013	1080.37	1522.0	2602.4	1085.34	1716.2	2801.5	2.7927	3.2802	6.0729
255	4.3195	0.001263	0.04598	1104.26	1496.7	2600.9	1109.72	1689.8	2799.5	2.8382	3.1992	6.0374
260	4.6886	0.001276	0.04220	1128.37	1470.6	2599.0	1134.35	1662.5	2796.9	2.8837	3.1181	6.0018
265	5.0813	0.001289	0.03877	1152.72	1443.9	2596.6	1159.27	1634.3	2793.6	2.9293	3.0368	5.9661
270	5.4987	0.001302	0.03564	1177.33	1416.3	2593.7	1184.49	1605.2	2789.7	2.9750	2.9551	5.9301
275	5.9418	0.001317	0.03279	1202.23	1387.9	2590.2	1210.05	1574.9	2785.0	3.0208	2.8730	5.8937
280	6.4117	0.001332	0.03017	1227.43	1358.7	2586.1	1235.97	1543.6	2779.5	3.0667	2.7903	5.8570
285	6.9094	0.001348	0.02777	1252.98	1328.4	2581.4	1262.29	1511.0	2773.3	3.1129	2.7069	5.8198
290	7.4360	0.001366	0.02557	1278.89	1297.1	2576.0	1289.04	1477.1	2766.1	3.1593	2.6227	5.7821
295	7.9928	0.001384	0.02354	1305.21	1264.7	2569.9	1316.27	1441.8	2758.0	3.2061	2.5375	5.7436
300	8.5810	0.001404	0.02167	1331.97	1231.0	2563.0	1344.01	1404.9	2748.9	3.2533	2.4511	5.7044
305	9.2018	0.001425	0.01995	1359.22	1195.9	2555.2	1372.33	1366.4	2738.7	3.3009	2.3633	5.6642
310	9.8566	0.001447	0.01835	1387.03	1159.4	2546.4	1401.29	1326.0	2727.3	3.3492	2.2737	5.6229
315	10.547	0.001472	0.01687	1415.44	1121.1	2536.6	1430.97	1283.5	2714.4	3.3981	2.1821	5.5803
320	11.274	0.001499	0.01549	1444.55	1080.9	2525.5	1461.45	1238.6	2700.1	3.4479	2.0882	5.5361
330	12.845	0.001561	0.012996	1505.24	993.7	2498.9	1525.29	1140.6	2665.8	3.5506	1.8909	5.4416
340	14.596	0.001638	0.010797	1570.26	894.3	2464.5	1594.15	1027.9	2622.0	3.6593	1.6763	5.3356
350	16.514	0.001740	0.008813	1641.81	776.6	2418.4	1670.54	893.4	2563.9	3.7776	1.4336	5.2111
360	18.651	0.001892	0.006945	1725.19	626.3	2351.5	1760.48	720.5	2481.0	3.9146	1.1379	5.0525
370	21.028	0.002213	0.004926	1843.84	384.7	2228.5	1890.37	441.8	2332.1	4.1104	0.6868	4.7972
374.14	22.089	0.003155	0.003155	2029.58	0	2029.6	2099.26	0	2099.3	4.4297	0	4.4297

TABLE B.2 Saturated Water: Pressure Table

P kPa, MPa	T °C	$\hat{v}_l$ m³/kg	$\hat{v}_v$ m³/kg	$\hat{u}_l$ kJ/kg	$\Delta\hat{u}_{lv}$ kJ/kg	$\hat{u}_v$ kJ/kg	$\hat{h}_l$ kJ/kg	$\Delta\hat{h}_{lv}$ kJ/kg	$\hat{h}_v$ kJ/kg	$\hat{s}_l$ kJ/kg K	$\Delta\hat{s}_{lv}$ kJ/kg K	$\hat{s}_v$ kJ/kg K
0.6113	0.01	0.001000	206.132	0	2375.3	2375.3	0.00	2501.3	2501.3	0	9.1562	9.1562
1.0	6.98	0.001000	129.208	29.29	2355.7	2385.0	29.29	2484.9	2514.2	0.1059	8.8697	8.9756
1.5	13.03	0.001001	87.980	54.70	2338.6	2393.3	54.70	2470.6	2525.3	0.1956	8.6322	8.8278
2.0	17.50	0.001001	67.004	73.47	2326.0	2399.5	73.47	2460.0	2533.5	0.2607	8.4629	8.7236
2.5	21.08	0.001002	54.254	88.47	2315.9	2404.4	88.47	2451.6	2540.0	0.3120	8.3311	8.6431
3.0	24.08	0.001003	45.665	101.03	2307.5	2408.5	101.03	2444.5	2545.5	0.3545	8.2231	8.5775
4.0	28.96	0.001004	34.800	121.44	2293.7	2415.2	121.44	2432.9	2554.4	0.4226	8.0520	8.4746
5.0	32.88	0.001005	28.193	137.79	2282.7	2420.5	137.79	2423.7	2561.4	0.4763	7.9187	8.3950
7.5	40.29	0.001008	19.238	168.76	2261.7	2430.5	168.77	2406.0	2574.8	0.5763	7.6751	8.2514
10.0	45.81	0.001010	14.674	191.79	2246.1	2437.9	191.81	2392.8	2584.6	0.6492	7.5010	8.1501
15.0	53.97	0.001014	10.022	225.90	2222.8	2448.7	225.91	2373.1	2599.1	0.7548	7.2536	8.0084
20.0	60.06	0.001017	7.649	251.35	2205.4	2456.7	251.38	2358.3	2609.7	0.8319	7.0766	7.9085
25.0	64.97	0.001020	6.204	271.88	2191.2	2463.1	271.90	2346.3	2618.2	0.8930	6.9383	7.8313
30.0	69.10	0.001022	5.229	289.18	2179.2	2468.4	289.21	2336.1	2625.3	0.9439	6.8247	7.7686
40.0	75.87	0.001026	3.993	317.51	2159.5	2477.0	317.55	2319.2	2636.7	1.0258	6.6441	7.6700
50.0	81.33	0.001030	3.240	340.42	2143.4	2483.8	340.47	2305.4	2645.9	1.0910	6.5029	7.5939
75.0	91.77	0.001037	2.217	384.29	2112.4	2496.7	384.36	2278.6	2663.0	1.2129	6.2434	7.4563
0.100	99.62	0.001043	1.6940	417.33	2088.7	2506.1	417.44	2258.0	2675.5	1.3025	6.0568	7.3593
0.125	105.99	0.001048	1.3749	444.16	2069.3	2513.5	444.30	2241.1	2685.3	1.3739	5.9104	7.2843
0.150	111.37	0.001053	1.1593	466.92	2052.7	2519.6	467.08	2226.5	2693.5	1.4335	5.7897	7.2232
0.175	116.06	0.001057	1.0036	486.78	2038.1	2524.9	486.97	2213.6	2700.5	1.4848	5.6868	7.1717
0.200	120.23	0.001061	0.8857	504.47	2025.0	2529.5	504.68	2202.0	2706.6	1.5300	5.5970	7.1271
0.225	124.00	0.001064	0.7933	520.45	2013.1	2533.6	520.69	2191.3	2712.0	1.5705	5.5173	7.0878
0.250	127.43	0.001067	0.7187	535.08	2002.1	2537.2	535.34	2181.5	2716.9	1.6072	5.4455	7.0526
0.275	130.60	0.001070	0.6573	548.57	1992.0	2540.5	548.87	2172.4	2721.3	1.6407	5.3801	7.0208
0.300	133.55	0.001073	0.6058	561.13	1982.4	2543.6	561.45	2163.9	2725.3	1.6717	5.3201	6.9918
0.325	136.30	0.001076	0.5620	572.88	1973.5	2546.3	573.23	2155.8	2729.0	1.7005	5.2646	6.9651
0.350	138.88	0.001079	0.5243	583.93	1965.0	2548.9	584.31	2148.1	2732.4	1.7274	5.2130	6.9404
0.375	141.32	0.001081	0.4914	594.38	1956.9	2551.3	594.79	2140.8	2735.6	1.7527	5.1647	6.9174
0.40	143.63	0.001084	0.4625	604.29	1949.3	2553.6	604.73	2133.8	2738.5	1.7766	5.1193	6.8958
0.45	147.93	0.001088	0.4140	622.75	1934.9	2557.6	623.24	2120.7	2743.9	1.8206	5.0359	6.8565
0.50	151.86	0.001093	0.3749	639.66	1921.6	2561.2	640.21	2108.5	2748.7	1.8606	4.9606	6.8212
0.55	155.48	0.001097	0.3427	655.30	1909.2	2564.5	655.91	2097.0	2752.9	1.8972	4.8920	6.7892
0.60	158.85	0.001101	0.3157	669.88	1897.5	2567.4	670.54	2086.3	2756.8	1.9311	4.8289	6.7600
0.65	162.01	0.001104	0.2927	683.55	1886.5	2570.1	684.26	2076.0	2760.3	1.9627	4.7704	6.7330
0.70	164.97	0.001108	0.2729	696.43	1876.1	2572.5	697.20	2066.3	2763.5	1.9922	4.7158	6.7080

TABLE B.2 Continued

0.75	167.77	0.001111	0.2556	708.62	1866.1	2574.7	709.45	2057.0	2766.4	2.0199	4.6647	6.6846
0.80	170.43	0.001115	0.2404	720.20	1856.6	2576.8	721.10	2048.0	2769.1	2.0461	4.6166	6.6627
0.85	172.96	0.001118	0.2270	731.25	1847.4	2578.7	732.20	2039.4	2771.6	2.0709	4.5711	6.6421
0.90	175.38	0.001121	0.2150	741.81	1838.7	2580.5	742.82	2031.1	2773.9	2.0946	4.5280	6.6225
0.95	177.69	0.001124	0.2042	751.94	1830.2	2582.1	753.00	2023.1	2776.1	2.1171	4.4869	6.6040
1.00	179.91	0.001127	0.19444	761.67	1822.0	2583.6	762.79	2015.3	2778.1	2.1386	4.4478	6.5864
1.10	184.09	0.001133	0.17753	780.08	1806.3	2586.4	781.32	2000.4	2781.7	2.1791	4.3744	6.5535
1.20	187.99	0.001139	0.16333	797.27	1791.6	2588.8	798.64	1986.2	2784.8	2.2165	4.3067	6.5233
1.30	191.64	0.001144	0.15125	813.42	1777.5	2590.9	814.91	1972.7	2787.6	2.2514	4.2438	6.4953
1.40	195.07	0.001149	0.14084	828.68	1764.1	2592.8	830.29	1959.7	2790.0	2.2842	4.1850	6.4692
1.50	198.32	0.001154	0.13177	843.14	1751.3	2594.5	844.87	1947.3	2792.1	2.3150	4.1298	6.4448
1.75	205.76	0.001166	0.11349	876.44	1721.4	2597.8	878.48	1918.0	2796.4	2.3851	4.0044	6.3895
2.00	212.42	0.001177	0.09963	906.42	1693.8	2600.3	908.77	1890.7	2799.5	2.4473	3.8935	6.3408
2.25	218.45	0.001187	0.08875	933.81	1668.2	2602.0	936.48	1865.2	2801.7	2.5034	3.7938	6.2971
2.50	223.99	0.001197	0.07998	959.09	1644.0	2603.1	962.09	1841.0	2803.1	2.5546	3.7028	6.2574
2.75	229.12	0.001207	0.07275	982.65	1621.2	2603.8	985.97	1817.9	2803.9	2.6018	3.6190	6.2208
3.00	233.90	0.001216	0.06668	1004.76	1599.3	2604.1	1008.41	1795.7	2804.1	2.6456	3.5412	6.1869
3.25	238.38	0.001226	0.06152	1025.62	1578.4	2604.0	1029.60	1774.4	2804.0	2.6866	3.4685	6.1551
3.50	242.60	0.001235	0.05707	1045.41	1558.3	2603.7	1049.73	1753.7	2803.4	2.7252	3.4000	6.1252
4.0	250.40	0.001252	0.049778	1082.28	1520.0	2602.3	1087.29	1714.1	2801.4	2.7963	3.2737	6.0700
5.0	263.99	0.001286	0.039441	1147.78	1449.3	2597.1	1154.21	1640.1	2794.3	2.9201	3.0532	5.9733
6.0	275.64	0.001319	0.032440	1205.41	1384.3	2589.7	1213.32	1571.0	2784.3	3.0266	2.8625	5.8891
7.0	285.88	0.001351	0.027370	1257.51	1323.0	2580.5	1266.97	1505.1	2772.1	3.1210	2.6922	5.8132
8.0	295.06	0.001384	0.023518	1305.54	1264.3	2569.8	1316.61	1441.3	2757.9	3.2067	2.5365	5.7431
9.0	303.40	0.001418	0.020484	1350.47	1207.3	2557.8	1363.23	1378.9	2742.1	3.2857	2.3915	5.6771
10.0	311.06	0.001452	0.018026	1393.00	1151.4	2544.4	1407.53	1317.1	2724.7	3.3595	2.2545	5.6140
11.0	318.15	0.001489	0.015987	1433.68	1096.1	2529.7	1450.05	1255.5	2705.6	3.4294	2.1233	5.5527
12.0	324.75	0.001527	0.014263	1472.92	1040.8	2513.7	1491.24	1193.6	2684.8	3.4961	1.9962	5.4923
13.0	330.93	0.001567	0.012780	1511.09	985.0	2496.1	1531.46	1130.8	2662.2	3.5604	1.8718	5.4323
14.0	336.75	0.001611	0.011485	1548.53	928.2	2476.8	1571.08	1066.5	2637.5	3.6231	1.7485	5.3716
15.0	342.24	0.001658	0.010338	1585.58	869.8	2455.4	1610.45	1000.0	2610.5	3.6847	1.6250	5.3097
16.0	347.43	0.001711	0.009306	1622.63	809.1	2431.7	1650.00	930.6	2580.6	3.7460	1.4995	5.2454
17.0	352.37	0.001770	0.008365	1660.16	744.8	2405.0	1690.25	856.9	2547.2	3.8078	1.3698	5.1776
18.0	357.06	0.001840	0.007490	1698.86	675.4	2374.3	1731.97	777.1	2509.1	3.8713	1.2330	5.1044
19.0	361.54	0.001924	0.006657	1739.87	598.2	2338.1	1776.43	688.1	2464.5	3.9387	1.0841	5.0227
20.0	365.81	0.002035	0.005834	1785.47	507.6	2293.1	1826.18	583.6	2409.7	4.0137	0.9132	4.9269

TABLE B.3 Saturated Water:Solid–Vapor

T °C	P kPa, MPa	$\hat{v}_s$ m³/kg	$\hat{v}_v$ m³/kg	$\hat{u}_s$ kJ/kg	$\Delta\hat{u}_{sv}$ kJ/kg	$\hat{u}_v$ kJ/kg	$\hat{h}_s$ kJ/kg	$\Delta\hat{h}_{sv}$ kJ/kg	$\hat{h}_v$ kJ/kg	$\hat{s}_s$ kJ/kg K	$\Delta\hat{s}_{sv}$ kJ/kg K	$\hat{s}_v$ kJ/kg K
0.01	0.6113	1.0908	206.153	−333.40	2708.7	2375.3	−333.40	2834.7	2501.3	−1.2210	10.3772	9.1562
0	0.6108	1.0908	206.315	−333.42	2708.7	2375.3	−333.42	2834.8	2501.3	−1.2211	10.3776	9.1565
−2	0.5177	1.0905	241.663	−337.61	2710.2	2372.5	−337.61	2835.3	2497.6	−1.2369	10.4562	9.2193
−4	0.4376	1.0901	283.799	−341.78	2711.5	2369.8	−341.78	2835.7	2494.0	−1.2526	10.5358	9.2832
−6	0.3689	1.0898	334.139	−345.91	2712.9	2367.0	−345.91	2836.2	2490.3	−1.2683	10.6165	9.3482
−8	0.3102	1.0894	394.414	−350.02	2714.2	2364.2	−350.02	2836.6	2486.6	−1.2839	10.6982	9.4143
−10	0.2601	1.0891	466.757	−354.09	2715.5	2361.4	−354.09	2837.0	2482.9	−1.2995	10.7809	9.4815
−12	0.2176	1.0888	553.803	−358.14	2716.8	2358.7	−358.14	2837.3	2479.2	−1.3150	10.8648	9.5498
−14	0.1815	1.0884	658.824	−362.16	2718.0	2355.9	−362.16	2837.6	2475.5	−1.3306	10.9498	9.6192
−16	0.1510	1.0881	785.907	−366.14	2719.2	2353.1	−366.14	2837.9	2471.8	−1.3461	11.0359	9.6898
−18	0.12521	1.0878	940.183	−370.10	2720.4	2350.3	−370.10	2838.2	2468.1	−1.3617	11.1233	9.7616
−20	0.10355	1.0874	1128.113	−374.03	2721.6	2347.5	−374.03	2838.4	2464.3	−1.3772	11.2120	9.8348
−22	0.08535	1.0871	1357.864	−377.93	2722.7	2344.7	−377.93	2838.6	2460.6	−1.3928	11.3020	9.9093
−24	0.07012	1.0868	1639.753	−381.80	2723.7	2342.0	−381.80	2838.7	2456.9	−1.4083	11.3935	9.9852
−26	0.05741	1.0864	1986.776	−385.64	2724.8	2339.2	−385.64	2838.9	2453.2	−1.4239	11.4864	10.0625
−28	0.04684	1.0861	2415.201	−389.45	2725.8	2336.4	−389.45	2839.0	2449.5	−1.4394	11.5808	10.1413
−30	0.03810	1.0858	2945.228	−393.23	2726.8	2333.6	−393.23	2839.0	2445.8	−1.4550	11.6765	10.2215
−32	0.03090	1.0854	3601.823	−396.98	2727.8	2330.8	−396.98	2839.1	2442.1	−1.4705	11.7733	10.3028
−34	0.02499	1.0851	4416.253	−400.71	2728.7	2328.0	−400.71	2839.1	2438.4	−1.4860	11.8713	10.3853
−36	0.02016	1.0848	5430.116	−404.40	2729.6	2325.2	−404.40	2839.1	2434.7	−1.5014	11.9704	10.4690
−38	0.01618	1.0844	6707.022	−408.06	2730.5	2322.4	−408.06	2839.0	2431.0	−1.5168	12.0714	10.5546
−40	0.01286	1.0841	8366.396	−411.70	2731.3	2319.6	−411.70	2838.9	2427.2	−1.5321	12.1768	10.6447

TABLE B.4 Superheated Water Vapor

$P = 10$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	14.674	2437.9	2584.6	8.1501
50	14.869	2443.9	2592.6	8.1749
100	17.196	2515.5	2687.5	8.4479
150	19.513	2587.9	2783.0	8.6881
200	21.825	2661.3	2879.5	8.9037
250	24.136	2736.0	2977.3	9.1002
300	26.445	2812.1	3076.5	9.2812
400	31.063	2968.9	3279.5	9.6076
500	35.679	3132.3	3489.0	9.8977
600	40.295	3302.5	3705.4	10.1608
700	44.911	3479.6	3928.7	10.4028
800	49.526	3663.8	4159.1	10.6281
900	54.141	3855.0	4396.4	10.8395
1000	58.757	4053.0	4640.6	11.0392
1100	63.372	4257.5	4891.2	11.2287
1200	67.987	4467.9	5147.8	11.4090
1300	72.603	4683.7	5409.7	11.5810

$P = 50$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	3.240	2483.8	2645.9	7.5939
100	3.418	2511.6	2682.5	7.6947
150	3.889	2585.6	2780.1	7.9400
200	4.356	2659.8	2877.6	8.1579
250	4.821	2735.0	2976.0	8.3555
300	5.284	2811.3	3075.5	8.5372
400	6.209	2968.4	3278.9	8.8641
500	7.134	3131.9	3488.6	9.1545
600	8.058	3302.2	3705.1	9.4177
700	8.981	3479.5	3928.5	9.6599
800	9.904	3663.7	4158.9	9.8852
900	10.828	3854.9	4396.3	10.0967
1000	11.751	4052.9	4640.5	10.2964
1100	12.674	4257.4	4891.1	10.4858
1200	13.597	4467.8	5147.7	10.6662
1300	14.521	4683.6	5409.6	10.8382

$P = 100$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	1.6940	2506.1	2675.5	7.3593
100	1.6958	2506.6	2676.2	7.3614
150	1.9364	2582.7	2776.4	7.6133
200	2.1723	2658.0	2875.3	7.8342
250	2.4060	2733.7	2974.3	8.0332
300	2.6388	2810.4	3074.3	8.2157
400	3.1026	2967.8	3278.1	8.5434
500	3.5655	3131.5	3488.1	8.8341
600	4.0278	3301.9	3704.7	9.0975
700	4.4899	3479.2	3928.2	9.3398
800	4.9517	3663.5	4158.7	9.5652
900	5.4135	3854.8	4396.1	9.7767
1000	5.8753	4052.8	4640.3	9.9764
1100	6.3370	4257.3	4890.9	10.1658
1200	6.7986	4467.7	5147.6	10.3462
1300	7.2603	4683.5	5409.5	10.5182

$P = 200$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.88573	2529.5	2706.6	7.1271
150	0.95964	2576.9	2768.8	7.2795
200	1.08034	2654.4	2870.5	7.5066
250	1.19880	2731.2	2971.0	7.7085
300	1.31616	2808.6	3071.8	7.8926
400	1.54930	2966.7	3276.5	8.2217
500	1.78139	3130.7	3487.0	8.5132
600	2.01297	3301.4	3704.0	8.7769
700	2.24426	3478.8	3927.7	9.0194
800	2.47539	3663.2	4158.3	9.2450
900	2.70643	3854.5	4395.8	9.4565
1000	2.93740	4052.5	4640.0	9.6563
1100	3.16834	4257.0	4890.7	9.8458
1200	3.39927	4467.5	5147.3	10.0262
1300	3.63018	4683.2	5409.3	10.1982

$P = 300$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.60582	2543.6	2725.3	6.9918
150	0.63388	2570.8	2761.0	7.0778
200	0.71629	2650.7	2865.5	7.3115
250	0.79636	2728.7	2967.6	7.5165
300	0.87529	2806.7	3069.3	7.7022
400	1.03151	2965.5	3275.0	8.0329
500	1.18669	3130.0	3486.0	8.3250
600	1.34136	3300.8	3703.2	8.5892
700	1.49573	3478.4	3927.1	8.8319
800	1.64994	3662.9	4157.8	9.0575
900	1.80406	3854.2	4395.4	9.2691
1000	1.95812	4052.3	4639.7	9.4689
1100	2.11214	4256.8	4890.4	9.6585
1200	2.26614	4467.2	5147.1	9.8389
1300	2.42013	4683.0	5409.0	10.0109

$P = 400$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.46246	2553.6	2738.5	6.8958
150	0.47084	2564.5	2752.8	6.9299
200	0.53422	2646.8	2860.5	7.1706
250	0.59512	2726.1	2964.2	7.3788
300	0.65484	2804.8	3066.7	7.5661
400	0.77262	2964.4	3273.4	7.8984
500	0.88934	3129.2	3484.9	8.1912
600	1.00555	3300.2	3702.4	8.4557
700	1.12147	3477.9	3926.5	8.6987
800	1.23722	3662.5	4157.4	8.9244
900	1.35288	3853.9	4395.1	9.1361
1000	1.46847	4052.0	4639.4	9.3360
1100	1.58404	4256.5	4890.1	9.5255
1200	1.69958	4467.0	5146.8	9.7059
1300	1.81511	4682.8	5408.8	9.8780

TABLE B.4 Continued

$P = 500$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.37489	2561.2	2748.7	6.8212
200	0.42492	2642.9	2855.4	7.0592
250	0.47436	2723.5	2960.7	7.2708
300	0.52256	2802.9	3064.2	7.4598
350	0.57012	2882.6	3167.6	7.6328
400	0.61728	2963.2	3271.8	7.7937
500	0.71093	3128.4	3483.8	8.0872
600	0.80406	3299.6	3701.7	8.3521
700	0.89691	3477.5	3926.0	8.5952
800	0.98959	3662.2	4157.0	8.8211
900	1.08217	3853.6	4394.7	9.0329
1000	1.17469	4051.8	4639.1	9.2328
1100	1.26718	4256.3	4889.9	9.4224
1200	1.35964	4466.8	5146.6	9.6028
1300	1.45210	4682.5	5408.6	9.7749

$P = 600$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.31567	2567.4	2756.8	6.7600
200	0.35202	2638.9	2850.1	6.9665
250	0.39383	2720.9	2957.2	7.1816
300	0.43437	2801.0	3061.6	7.3723
350	0.47424	2881.1	3165.7	7.5463
400	0.51372	2962.0	3270.2	7.7078
500	0.59199	3127.6	3482.7	8.0020
600	0.66974	3299.1	3700.9	8.2673
700	0.74720	3477.1	3925.4	8.5107
800	0.82450	3661.8	4156.5	8.7367
900	0.90169	3853.3	4394.4	8.9485
1000	0.97883	4051.5	4638.8	9.1484
1100	1.05594	4256.1	4889.6	9.3381
1200	1.13302	4466.5	5146.3	9.5185
1300	1.21009	4682.3	5408.3	9.6906

$P = 800$ kPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.24043	2576.8	2769.1	6.6627
200	0.26080	2630.6	2839.2	6.8158
250	0.29314	2715.5	2950.0	7.0384
300	0.32411	2797.1	3056.4	7.2327
350	0.35439	2878.2	3161.7	7.4088
400	0.38426	2959.7	3267.1	7.5715
500	0.44331	3125.9	3480.6	7.8672
600	0.50184	3297.9	3699.4	8.1332
700	0.56007	3476.2	3924.3	8.3770
800	0.61813	3661.1	4155.7	8.6033
900	0.67610	3852.8	4393.6	8.8153
1000	0.73401	4051.0	4638.2	9.0153
1100	0.79188	4255.6	4889.1	9.2049
1200	0.84974	4466.1	5145.8	9.3854
1300	0.90758	4681.8	5407.9	9.5575

$P = 1$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.19444	2583.6	2778.1	6.5864
200	0.20596	2621.9	2827.9	6.6939
250	0.23268	2709.9	2942.6	6.9246
300	0.25794	2793.2	3051.2	7.1228
350	0.28247	2875.2	3157.7	7.3010
400	0.30659	2957.3	3263.9	7.4650
500	0.35411	3124.3	3478.4	7.7621
600	0.40109	3296.8	3697.9	8.0289
700	0.44779	3475.4	3923.1	8.2731
800	0.49432	3660.5	4154.8	8.4996
900	0.54075	3852.2	4392.9	8.7118
1000	0.58712	4050.5	4637.6	8.9119
1100	0.63345	4255.1	4888.5	9.1016
1200	0.67977	4465.6	5145.4	9.2821
1300	0.72608	4681.3	5407.4	9.4542

$P = 1.2$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.16333	2588.8	2784.8	6.5233
200	0.16930	2612.7	2815.9	6.5898
250	0.19235	2704.2	2935.0	6.8293
300	0.21382	2789.2	3045.8	7.0316
350	0.23452	2872.2	3153.6	7.2120
400	0.25480	2954.9	3260.7	7.3773
500	0.29463	3122.7	3476.3	7.6758
600	0.33393	3295.6	3696.3	7.9434
700	0.37294	3474.5	3922.0	8.1881
800	0.41177	3659.8	4153.9	8.4149
900	0.45051	3851.6	4392.2	8.6272
1000	0.48919	4050.0	4637.0	8.8274
1100	0.52783	4254.6	4888.0	9.0171
1200	0.56646	4465.1	5144.9	9.1977
1300	0.60507	4680.9	5406.9	9.3698

$P = 1.4$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.14084	2592.8	2790.0	6.4692
200	0.14302	2603.1	2803.3	6.4975
250	0.16350	2698.3	2927.2	6.7467
300	0.18228	2785.2	3040.4	6.9533
350	0.20026	2869.1	3149.5	7.1359
400	0.21780	2952.5	3257.4	7.3025
500	0.25215	3121.1	3474.1	7.6026
600	0.28596	3294.4	3694.8	7.8710
700	0.31947	3473.6	3920.9	8.1160
800	0.35281	3659.1	4153.0	8.3431
900	0.38606	3851.0	4391.5	8.5555
1000	0.41924	4049.5	4636.4	8.7558
1100	0.45239	4254.1	4887.5	8.9456
1200	0.48552	4464.6	5144.4	9.1262
1300	0.51864	4680.4	5406.5	9.2983

TABLE B.4 Continued

$P = 1.6$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.12380	2595.9	2794.0	6.4217
225	0.13287	2644.6	2857.2	6.5518
250	0.14184	2692.3	2919.2	6.6732
300	0.15862	2781.0	3034.8	6.8844
350	0.17456	2866.0	3145.4	7.0693
400	0.19005	2950.1	3254.2	7.2373
500	0.22029	3119.5	3471.9	7.5389
600	0.24998	3293.3	3693.2	7.8080
700	0.27937	3472.7	3919.7	8.0535
800	0.30859	3658.4	4152.1	8.2808
900	0.33772	3850.5	4390.8	8.4934
1000	0.36678	4049.0	4635.8	8.6938
1100	0.39581	4253.7	4887.0	8.8837
1200	0.42482	4464.2	5143.9	9.0642
1300	0.45382	4679.9	5406.0	9.2364

$P = 1.8$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.11042	2598.4	2797.1	6.3793
225	0.11673	2636.6	2846.7	6.4807
250	0.12497	2686.0	2911.0	6.6066
300	0.14021	2776.8	3029.2	6.8226
350	0.15457	2862.9	3141.2	7.0099
400	0.16847	2947.7	3250.9	7.1793
500	0.19550	3117.8	3469.7	7.4824
600	0.22199	3292.1	3691.7	7.7523
700	0.24818	3471.9	3918.6	7.9983
800	0.27420	3657.7	4151.3	8.2258
900	0.30012	3849.9	4390.1	8.4386
1000	0.32598	4048.4	4635.2	8.6390
1100	0.35180	4253.2	4886.4	8.8290
1200	0.37761	4463.7	5143.4	9.0096
1300	0.40340	4679.4	5405.6	9.1817

$P = 2$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.09963	2600.3	2799.5	6.3408
225	0.10377	2628.3	2835.8	6.4146
250	0.11144	2679.6	2902.5	6.5452
300	0.12547	2772.6	3023.5	6.7663
350	0.13857	2859.8	3137.0	6.9562
400	0.15120	2945.2	3247.6	7.1270
500	0.17568	3116.2	3467.6	7.4316
600	0.19960	3290.9	3690.1	7.7023
700	0.22323	3471.0	3917.5	7.9487
800	0.24668	3657.0	4150.4	8.1766
900	0.27004	3849.3	4389.4	8.3895
1000	0.29333	4047.9	4634.6	8.5900
1100	0.31659	4252.7	4885.9	8.7800
1200	0.33984	4463.2	5142.9	8.9606
1300	0.36306	4679.0	5405.1	9.1328

$P = 2.5$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.07998	2603.1	2803.1	6.2574
225	0.08027	2605.6	2806.3	6.2638
250	0.08700	2662.5	2880.1	6.4084
300	0.09890	2761.6	3008.8	6.6437
350	0.10976	2851.8	3126.2	6.8402
400	0.12010	2939.0	3239.3	7.0147
450	0.13014	3025.4	3350.8	7.1745
500	0.13998	3112.1	3462.0	7.3233
600	0.15930	3288.0	3686.2	7.5960
700	0.17832	3468.8	3914.6	7.8435
800	0.19716	3655.3	4148.2	8.0720
900	0.21590	3847.9	4387.6	8.2853
1000	0.23458	4046.7	4633.1	8.4860
1100	0.25322	4251.5	4884.6	8.6761
1200	0.27185	4462.1	5141.7	8.8569
1300	0.29046	4677.8	5404.0	9.0291

$P = 3$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.06668	2604.1	2804.1	6.1869
250	0.07058	2644.0	2855.8	6.2871
300	0.08114	2750.0	2993.5	6.5389
350	0.09053	2843.7	3115.3	6.7427
400	0.09936	2932.7	3230.8	6.9211
450	0.10787	3020.4	3344.0	7.0833
500	0.11619	3107.9	3456.5	7.2337
600	0.13243	3285.0	3682.3	7.5084
700	0.14838	3466.6	3911.7	7.7571
800	0.16414	3653.6	4146.0	7.9862
900	0.17980	3846.5	4385.9	8.1999
1000	0.19541	4045.4	4631.6	8.4009
1100	0.21098	4250.3	4883.3	8.5911
1200	0.22652	4460.9	5140.5	8.7719
1300	0.24206	4676.6	5402.8	8.9442

$P = 3.5$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.05707	2603.7	2803.4	6.1252
250	0.05873	2623.7	2829.2	6.1748
300	0.06842	2738.0	2977.5	6.4460
350	0.07678	2835.3	3104.0	6.6578
400	0.08453	2926.4	3222.2	6.8404
450	0.09196	3015.3	3337.2	7.0051
500	0.09918	3103.7	3450.9	7.1571
600	0.11324	3282.1	3678.4	7.4338
700	0.12699	3464.4	3908.8	7.6837
800	0.14056	3651.8	4143.8	7.9135
900	0.15402	3845.0	4384.1	8.1275
1000	0.16743	4044.1	4630.1	8.3288
1100	0.18080	4249.1	4881.9	8.5191
1200	0.19415	4459.8	5139.3	8.7000
1300	0.20749	4675.5	5401.7	8.8723

TABLE B.4 Continued

$P = 4$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.04978	2602.3	2801.4	6.0700
275	0.05457	2667.9	2886.2	6.2284
300	0.05884	2725.3	2960.7	6.3614
350	0.06645	2826.6	3092.4	6.5820
400	0.07341	2919.9	3213.5	6.7689
450	0.08003	3010.1	3330.2	6.9362
500	0.08643	3099.5	3445.2	7.0900
600	0.09885	3279.1	3674.4	7.3688
700	0.11095	3462.1	3905.9	7.6198
800	0.12287	3650.1	4141.6	7.8502
900	0.13469	3843.6	4382.3	8.0647
1000	0.14645	4042.9	4628.7	8.2661
1100	0.15817	4248.0	4880.6	8.4566
1200	0.16987	4458.6	5138.1	8.6376
1300	0.18156	4674.3	5400.5	8.8099

$P = 4.5$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.04406	2600.0	2798.3	6.0198
275	0.04730	2650.3	2863.1	6.1401
300	0.05135	2712.0	2943.1	6.2827
350	0.05840	2817.8	3080.6	6.5130
400	0.06475	2913.3	3204.7	6.7046
450	0.07074	3004.9	3323.2	6.8745
500	0.07651	3095.2	3439.5	7.0300
600	0.08765	3276.0	3670.5	7.3109
700	0.09847	3459.9	3903.0	7.5631
800	0.10911	3648.4	4139.4	7.7942
900	0.11965	3842.1	4380.6	8.0091
1000	0.13013	4041.6	4627.2	8.2108
1100	0.14056	4246.8	4879.3	8.4014
1200	0.15098	4457.4	5136.9	8.5824
1300	0.16139	4673.1	5399.4	8.7548

$P = 5$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.03944	2597.1	2794.3	5.9733
275	0.04141	2631.2	2838.3	6.0543
300	0.04532	2697.9	2924.5	6.2083
350	0.05194	2808.7	3068.4	6.4492
400	0.05781	2906.6	3195.6	6.6458
450	0.06330	2999.6	3316.1	6.8185
500	0.06857	3090.9	3433.8	6.9758
600	0.07869	3273.0	3666.5	7.2588
700	0.08849	3457.7	3900.1	7.5122
800	0.09811	3646.6	4137.2	7.7440
900	0.10762	3840.7	4378.8	7.9593
1000	0.11707	4040.3	4625.7	8.1612
1100	0.12648	4245.6	4878.0	8.3519
1200	0.13587	4456.3	5135.7	8.5330
1300	0.14526	4672.0	5398.2	8.7055

$P = 6$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.03244	2589.7	2784.3	5.8891
300	0.03616	2667.2	2884.2	6.0673
350	0.04223	2789.6	3043.0	6.3334
400	0.04739	2892.8	3177.2	6.5407
450	0.05214	2988.9	3301.8	6.7192
500	0.05665	3082.2	3422.1	6.8802
550	0.06101	3174.6	3540.6	7.0287
600	0.06525	3266.9	3658.4	7.1676
700	0.07352	3453.2	3894.3	7.4234
800	0.08160	3643.1	4132.7	7.6566
900	0.08958	3837.8	4375.3	7.8727
1000	0.09749	4037.8	4622.7	8.0751
1100	0.10536	4243.3	4875.4	8.2661
1200	0.11321	4454.0	5133.3	8.4473
1300	0.12106	4669.6	5396.0	8.6199

$P = 7$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.02737	2580.5	2772.1	5.8132
300	0.02947	2632.1	2838.4	5.9304
350	0.03524	2769.3	3016.0	6.2282
400	0.03993	2878.6	3158.1	6.4477
450	0.04416	2077.9	3287.0	6.6326
500	0.04814	3073.3	3410.3	6.7974
550	0.05195	3167.2	3530.9	6.9486
600	0.05565	3260.7	3650.3	7.0894
700	0.06283	3448.6	3888.4	7.3476
800	0.06981	3639.6	4128.3	7.5822
900	0.07669	3835.0	4371.8	7.7991
1000	0.08350	4035.3	4619.8	8.0020
1100	0.09027	4240.9	4872.8	8.1933
1200	0.09703	4451.7	5130.9	8.3747
1300	0.10377	4667.3	5393.7	8.5472

$P = 8$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.02352	2569.8	2757.9	5.7431
300	0.02426	2590.9	2785.0	5.7905
350	0.02995	2747.7	2987.3	6.1300
400	0.03432	2863.8	3138.3	6.3633
450	0.03817	2966.7	3272.0	6.5550
500	0.04175	3064.3	3398.3	6.7239
550	0.04516	3159.8	3521.0	6.8778
600	0.04845	3254.4	3642.0	7.0205
700	0.05481	3444.0	3882.5	7.2812
800	0.06097	3636.1	4123.8	7.5173
900	0.06702	3832.1	4368.3	7.7350
1000	0.07301	4032.8	4616.9	7.9384
1100	0.07896	4238.6	4870.3	8.1299
1200	0.08489	4449.4	5128.5	8.3115
1300	0.09080	4665.0	5391.5	8.4842

TABLE B.4 Continued

$P = 9$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.02048	2557.8	2742.1	5.6771
325	0.02327	2646.5	2855.9	5.8711
350	0.02580	2724.4	2956.5	6.0361
400	0.02993	2848.4	3117.8	6.2853
450	0.03350	2955.1	3256.6	6.4843
500	0.03677	3055.1	3386.1	6.6575
550	0.03987	3152.2	3511.0	6.8141
600	0.04285	3248.1	3633.7	6.9588
650	0.04574	3343.7	3755.3	7.0943
700	0.04857	3439.4	3876.5	7.2221
800	0.05409	3632.5	4119.4	7.4597
900	0.05950	3829.2	4364.7	7.6782
1000	0.06485	4030.3	4613.9	7.8821
1100	0.07016	4236.3	4867.7	8.0739
1200	0.07544	4447.2	5126.2	8.2556
1300	0.08072	4662.7	5389.2	8.4283

$P = 10$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.01803	2544.4	2724.7	5.6140
325	0.01986	2610.4	2809.0	5.7568
350	0.02242	2699.2	2923.4	5.9442
400	0.02641	2832.4	3096.5	6.2119
450	0.02975	2943.3	3240.8	6.4189
500	0.03279	3045.8	3373.6	6.5965
550	0.03564	3144.5	3500.9	6.7561
600	0.03837	3241.7	3625.3	6.9028
650	0.04101	3338.2	3748.3	7.0397
700	0.04358	3434.7	3870.5	7.1687
800	0.04859	3629.0	4114.9	7.4077
900	0.05349	3826.3	4361.2	7.6272
1000	0.05832	4027.8	4611.0	7.8315
1100	0.06312	4234.0	4865.1	8.0236
1200	0.06789	4444.9	5123.8	8.2054
1300	0.07265	4660.4	5387.0	8.3783

$P = 12.5$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	0.01350	2505.1	2673.8	5.4623
350	0.01613	2624.6	2826.2	5.7117
400	0.02000	2789.3	3039.3	6.0416
450	0.02299	2912.4	3199.8	6.2718
500	0.02560	3021.7	3341.7	6.4617
550	0.02801	3124.9	3475.1	6.6289
600	0.03029	3225.4	3604.0	6.7810
650	0.03248	3324.4	3730.4	6.9218
700	0.03460	3422.9	3855.4	7.0536
800	0.03869	3620.0	4103.7	7.2965
900	0.04267	3819.1	4352.5	7.5181
1000	0.04658	4021.6	4603.8	7.7237
1100	0.05045	4228.2	4858.8	7.9165
1200	0.05430	4439.3	5118.0	8.0987
1300	0.05813	4654.8	5381.4	8.2717

$P = 15$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	.010338	2455.4	2610.5	5.3097
350	.011470	2520.4	2692.4	5.4420
400	.015649	2740.7	2975.4	5.8810
450	.018446	2879.5	3156.2	6.1403
500	.020800	2996.5	3308.5	6.3442
550	.022927	3104.7	3448.6	6.5198
600	.024911	3208.6	3582.3	6.6775
650	.026797	3310.4	3712.3	6.8223
700	.028612	3410.9	3840.1	6.9572
800	.032096	3611.0	4092.4	7.2040
900	.035457	3811.9	4343.8	7.4279
1000	.038748	4015.4	4596.6	7.6347
1100	.042001	4222.6	4852.6	7.8282
1200	.045233	4433.8	5112.3	8.0108
1300	.048455	4649.1	5375.9	8.1839

$P = 17.5$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	.0079204	2390.2	2528.8	5.1418
400	.0124477	2685.0	2902.8	5.7212
450	.0151740	2844.2	3109.7	6.0182
500	.0173585	2970.3	3274.0	6.2382
550	.0192877	3083.8	3421.4	6.4229
600	.0210640	3191.5	3560.1	6.5866
650	.0227372	3296.0	3693.9	6.7356
700	.0243365	3398.8	3824.7	6.8736
800	.0273849	3601.9	4081.1	7.1245
900	.0303071	3804.7	4335.1	7.3507
1000	.0331580	4009.3	4589.5	7.5588
1100	.0359695	4216.9	4846.4	7.7530
1200	.0387605	4428.3	5106.6	7.9359
1300	.0415417	4643.5	5370.5	8.1093

$P = 20$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
sat	.0058342	2293.1	2409.7	4.9269
400	.0099423	2619.2	2818.1	5.5539
450	.0126953	2806.2	3060.1	5.9016
500	.0147683	2942.8	3238.2	6.1400
550	.0165553	3062.3	3393.5	6.3347
600	.0181781	3174.0	3537.6	6.5048
650	.0196929	3281.5	3675.3	6.6582
700	.0211311	3386.5	3809.1	6.7993
800	.0238532	3592.7	4069.8	7.0544
900	.0264463	3797.4	4326.4	7.2830
1000	.0289666	4003.1	4582.5	7.4925
1100	.0314471	4211.3	4840.2	7.6874
1200	.0339071	4422.8	5101.0	7.8706
1300	.0363574	4638.0	5365.1	8.0441

TABLE B.4 Continued

$P = 25$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
375	.001973	1798.6	1847.9	4.0319
400	.006004	2430.1	2580.2	5.1418
450	.009162	2720.7	2949.7	5.6743
500	.011124	2884.3	3162.4	5.9592
550	.012724	3017.5	3335.6	6.1764
600	.014138	3137.9	3491.4	6.3602
650	.015433	3251.6	3637.5	6.5229
700	.016647	3361.4	3777.6	6.6707
800	.018913	3574.3	4047.1	6.9345
900	.021045	3783.0	4309.1	7.1679
1000	.023102	3990.9	4568.5	7.3801
1100	.025119	4200.2	4828.2	7.5765
1200	.027115	4412.0	5089.9	7.7604
1300	.029101	4626.9	5354.4	7.9342

$P = 30$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
375	.001789	1737.8	1791.4	3.9303
400	.002790	2067.3	2151.0	4.4728
450	.006735	2619.3	2821.4	5.4423
500	.008679	2820.7	3081.0	5.7904
550	.010168	2970.3	3275.4	6.0342
600	.011446	3100.5	3443.9	6.2330
650	.012596	3221.0	3598.9	6.4057
700	.013661	3335.8	3745.7	6.5606
800	.015623	3555.6	4024.3	6.8332
900	.017448	3768.5	4291.9	7.0717
1000	.019196	3978.8	4554.7	7.2867
1100	.020903	4189.2	4816.3	7.4845
1200	.022589	4401.3	5079.0	7.6691
1300	.024266	4616.0	5344.0	7.8432

$P = 35$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
375	.001700	1702.9	1762.4	3.8721
400	.002100	1914.0	1987.5	4.2124
450	.004962	2498.7	2672.4	5.1962
500	.006927	2751.9	2994.3	5.6281
550	.008345	2920.9	3213.0	5.9025
600	.009527	3062.0	3395.5	6.1178
650	.010575	3189.8	3559.9	6.3010
700	.011533	3309.9	3713.5	6.4631
800	.013278	3536.8	4001.5	6.7450
900	.014883	3754.0	4274.9	6.9886
1000	.016410	3966.7	4541.1	7.2063
1100	.017895	4178.3	4804.6	7.4056
1200	.019360	4390.7	5068.4	7.5910
1300	.020815	4605.1	5333.6	7.7652

$P = 40$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
375	.0016406	1677.1	1742.7	3.8289
400	.0019017	1854.5	1930.8	4.1134
450	.0036931	2365.1	2512.8	4.9459
500	.0056225	2678.4	2903.3	5.4699
600	.0080943	3022.6	3346.4	6.0113
700	.0099415	3283.6	3681.3	6.3750
800	.0115228	3517.9	3978.8	6.6662
900	.0129626	3739.4	4257.9	6.9150
1000	.0143238	3954.6	4527.6	7.1356
1100	.0156426	4167.4	4793.1	7.3364
1200	.0169403	4380.1	5057.7	7.5224
1300	.0182292	4594.3	5323.5	7.6969

$P = 50$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
375	.0015593	1638.6	1716.5	3.7638
400	.0017309	1788.0	1874.6	4.0030
450	.0024862	2159.6	2283.9	4.5883
500	.0038924	2525.5	2720.1	5.1725
600	.0061123	2942.0	3247.6	5.8177
700	.0077274	3230.5	3616.9	6.2189
800	.0090761	3479.8	3933.6	6.5290
900	.0102831	3710.3	4224.4	6.7882
1000	.0114113	3930.5	4501.1	7.0146
1100	.0124966	4145.7	4770.6	7.2183
1200	.0135606	4359.1	5037.2	7.4058
1300	.0146159	4572.8	5303.6	7.5807

$P = 60$ MPa				
T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
375	.0015027	1609.3	1699.5	3.7140
400	.0016335	1745.3	1843.4	3.9317
450	.0020850	2053.9	2179.0	4.4119
500	.0029557	2390.5	2567.9	4.9320
600	.0048345	2861.1	3151.2	5.6451
700	.0062719	3177.3	3553.6	6.0824
800	.0074588	3441.6	3889.1	6.4110
900	.0085083	3681.0	4191.5	6.6805
1000	.0094800	3906.4	4475.2	6.9126
1100	.0104091	4124.1	4748.6	7.1194
1200	.0113167	4338.2	5017.2	7.3082
1300	.0122155	4551.4	5284.3	7.4837

TABLE B.5 Subcooled Liquid Water

$P = 5$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
0	.0009977	0.03	5.02	0.0001
20	.0009995	83.64	88.64	0.2955
40	.0010056	166.93	171.95	0.5705
60	.0010149	250.21	255.28	0.8284
80	.0010268	333.69	338.83	1.0719
100	.0010410	417.50	422.71	1.3030
120	.0010576	501.79	507.07	1.5232
140	.0010768	586.74	592.13	1.7342
160	.0010988	672.61	678.10	1.9374
180	.0011240	759.62	765.24	2.1341
200	.0011530	848.08	853.85	2.3254
220	.0011866	938.43	944.36	2.5128
240	.0012264	1031.34	1037.47	2.6978
260	.0012748	1127.92	1134.30	2.8829

$P = 10$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
0	.0009952	0.10	10.05	0.0003
20	.0009972	83.35	93.32	0.2945
40	.0010034	166.33	176.36	0.5685
60	.0010127	249.34	259.47	0.8258
80	.0010245	332.56	342.81	1.0687
100	.0010385	416.09	426.48	1.2992
120	.0010549	500.07	510.61	1.5188
140	.0010737	584.67	595.40	1.7291
160	.0010953	670.11	681.07	1.9316
180	.0011199	756.63	767.83	2.1274
200	.0011480	844.49.	855.97	2.3178
220	.0011805	934.07	945.88	2.5038
240	.0012187	1025.94	1038.13	2.6872
260	.0012645	1121.03	1133.68	2.8698
280	.0013216	1220.90	1234.11	3.0547
300	.0013972	1328.34	1342.31	3.2468

$P = 15$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
0	.0009928	0.15	15.04	0.0004
20	.0009950	83.05	97.97	0.2934
40	.0010013	165.73	180.75	0.5665
60	.0010105	248.49	263.65	0.8231
80	.0010222	331.46	346.79	1.0655
100	.0010361	414.72	430.26	1.2954
120	.0010522	498.39	514.17	1.5144
140	.0010707	582.64	598.70	1.7241
160	.0010918	667.69	684.07	1.9259
180	.0011159	753.74	770.48	2.1209
200	.0011433	841.04	858.18	2.3103
220	.0011748	929.89	947.52	2.4952
240	.0012114	1020.82	1038.99	2.6770
260	.0012550	1114.59	1133.41	2.8575
280	.0013084	1212.47	1232.09	3.0392
300	.0013770	1316.58	1337.23	3.2259
320	.0014724	1431.05	1453.13	3.4246
340	.0016311	1567.42	1591.88	3.6545

$P = 20$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
0	.0009904	0.20	20.00	0.0004
20	.0009928	82.75	102.61	0.2922
40	.0009992	165.15	185.14	0.5646
60	.0010084	247.66	267.82	0.8205
80	.0010199	330.38	350.78	1.0623
100	.0010337	413.37	434.04	1.2917
120	.0010496	496.75	517.74	1.5101
140	.0010678	580.67	602.03	1.7192
160	.0010885	665.34	687.11	1.9203
180	.0011120	750.94	773.18	2.1146
200	.0011387	837.70	860.47	2.3031
220	.0011693	925.89	949.27	2.4869
240	.0012046	1015.94	1040.04	2.6673
260	.0012462	1108.53	1133.45	2.8459
280	.0012965	1204.69	1230.62	3.0248
300	.0013596	1306.10	1333.29	3.2071
320	.0014437	1415.66	1444.53	3.3978
340	.0015683	1539.64	1571.01	3.6074
360	.0018226	1702.78	1739.23	3.8770

$P = 30$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
0	.0009856	0.25	29.82	0.0001
20	.0009886	82.16	111.82	0.2898
40	.0009951	164.01	193.87	0.5606
60	.0010042	246.03	276.16	0.8153
80	.0010156	328.28	358.75	1.0561
100	.0010290	410.76	441.63	1.2844
120	.0010445	493.58	524.91	1.5017
140	.0010621	576.86	608.73	1.7097
160	.0010821	660.81	693.27	1.9095
180	.0011047	745.57	778.71	2.1024
200	.0011302	831.34	865.24	2.2892
220	.0011590	918.32	953.09	2.4710
240	.0011920	1006.84	1042.60	2.6489
260	.0012303	1097.38	1134.29	2.8242
280	.0012755	1190.69	1228.96	2.9985
300	.0013304	1287.89	1327.80	3.1740
320	.0013997	1390.64	1432.63	3.3538
340	.0014919	1501.71	1546.47	3.5425
360	.0016265	1626.57	1675.36	3.7492
380	.0018691	1781.35	1837.43	4.0010

$P = 50$ MPa

T °C	$\hat{v}$ m³/kg	$\hat{u}$ kJ/kg	$\hat{h}$ kJ/kg	$\hat{s}$ kJ/kg K
0	.0009766	0.20	49.03	−0.0014
20	.0009804	80.98	130.00	0.2847
40	.0009872	161.84	211.20	0.5526
60	.0009962	242.96	292.77	0.8051
80	.0010073	324.32	374.68	1.0439
100	.0010201	405.86	456.87	1.2703
120	.0010348	487.63	539.37	1.4857
140	.0010515	569.76	622.33	1.6915
160	.0010703	652.39	705.91	1.8890
180	.0010912	735.68	790.24	2.0793
200	.0011146	819.73	875.46	2.2634
220	.0011408	904.67	961.71	2.4419
240	.0011702	990.69	1049.20	2.6158
260	.0012034	1078.06	1138.23	2.7860
280	.0012415	1167.19	1229.26	2.9536
300	.0012860	1258.66	1322.95	3.1200
320	.0013388	1353.23	1420.17	3.2867
340	.0014032	1451.91	1522.07	3.4556
360	.0014838	1555.97	1630.16	3.6290
380	.0015883	1667.13	1746.54	3.8100

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