

Appendix A

Physical and Critical Properties

See Tables A.1 and A.2.

Table A.1 Physical properties of various organic and inorganic substances [2, 3]

Compound	Formula	MW	Sp Gr	T_m K	T_b K	ΔH_v kJ/kg	ΔH_m kJ/kg
Air		28.97					
Ammonia	NH ₃	17.03	0.817	195.4	239.7	1374.0	322.4
Benzene	C ₆ H ₆	78.11	0.879	278.7	353.3	394.3	126.0
Benzyl alcohol	C ₇ H ₈ O	108.13	1.045	257.8	478.4		
Butane	n-C ₄ H ₁₀	58.12	0.579	134.8	272.7	383.6	80.3
Iso-Butane	i-C ₄ H ₁₀	58.12	0.557	113.6	261.4	366.4	105.7
Carbon dioxide	CO ₂	44.01	1.530				
Carbon disulfide	CS ₂	76.14	1.261	161.1	319.4	351.9	
Carbon monoxide	CO	28.01	0.968	68.1	81.7	214.2	
Cyclohexane	C ₆ H ₁₂	84.16	0.779	279.8	353.9	357.6	
Cyclopentane	C ₅ H ₁₀	70.13	0.745	179.7	322.4	389.2	
Diethyl ether	(C ₂ H ₅) ₂ O	74.12	0.708	156.9	307.8	352.1	
Ethane	C ₂ H ₆	30.07	1.049	89.9	184.5	488.8	
Ethanol	C ₂ H ₆ O	46.07	0.789	158.6	351.7	837.8	109.0
Ethylene glycol	C ₂ H ₆ O ₂	62.07	1.113	260.0	470.4	916.7	181.1
Glycerol	C ₃ H ₈ O ₃	92.09	1.260	291.4	563.2		200.6
Heptane	C ₇ H ₁₆	100.20	0.684	182.6	371.6	316.3	
Hexane	C ₆ H ₁₄	86.17	0.659	177.8	341.9	335.3	
Hydrogen	H ₂	2.02	0.069	14.0	20.4	445.5	59.5
Hydrogen chloride	HCl	36.47	1.268	158.9	188.1	444.2	
Hydrogen sulfide	H ₂ S	34.08	1.189	187.6	212.8	548.7	

(continued)

Table A.1 (continued)

Compound	Formula	<i>MW</i>	Sp Gr	<i>T_m</i> K	<i>T_b</i> K	ΔH_v kJ/kg	ΔH_m kJ/kg
Mercury	Hg	200.61	13.546				
Methane	CH ₄	16.04	0.554	90.7	111.7	511.2	58.4
Methanol	CH ₃ OH	32.04	0.792	175.3	337.9	1101.7	99.2
Nitric acid	HNO ₃	63.02	1.502	231.6	359.0	480.7	
Nitrogen	N ₂	28.02	0.9669	63.2	77.3	199.8	25.3
Nitrogen dioxide	NO ₂	46.01	1.448	263.9	294.5	319.4	
Nitrogen oxide	NO	30.01	1.037	109.5	121.4	459.8	
Nitrogen pentoxide	N ₂ O ₅	108.02	1.630	303.0	320.0		
Nitrous oxide	N ₂ O	44.02	1.53	182.1	184.4		
Oxygen	O ₂	32.00	1.105	54.4		212.5	13.7
n-Pentane	C ₅ H ₁₂	72.15	0.630	143.5	309.2	357.5	
Iso-pentane	i-C ₅ H ₁₂	72.15	0.621	113.1	300.9		
Propane	C ₃ H ₈	44.09	1.562	85.5	18.8		80.0
Propylene	C ₃ H ₆	1500	7.792	1.637	22.706	-6.915	
n-Propyl alcohol	C ₃ H ₈ O	60.09	0.804	146.0			
Iso-Propyl alcohol	C ₃ H ₈ O	60.09	0.785	183.5			
n-Propyl benzene	C ₉ H ₁₂	120.19	0.862	173.7	38.2		
Sodium hydroxide	NaOH	40.00	2.130	592.0	1663.0		
Sulfur dioxide	SO ₂	64.07	2.264	197.7	263.1	388.6	
Sulfur trioxide	SO ₃	80.07	2.750	290.0	316.5	522.0	
Sulfuric acid	H ₂ SO ₄	98.08	1.834	283.5			
Toluene	C ₆ H ₅ CH ₃	92.13	0.866	178.2	383.8	363.6	
Water	H ₂ O	18.02	1.000	273.2	373.2	2253.0	333.7

Table A.2 Critical properties [2, 3]

Species	<i>MW</i>	ω	<i>T_c</i> K	<i>P_c</i> atm	<i>V_c</i> cm ³ /mol
Air	28.97	0.035	132.5	37.2	88.3
H ₂	2.02	-0.216	33.3	12.8	65.0
Air	28.97	0.035	132.0	36.4	86.6
N ₂	28.01	0.038	126.2	33.5	90.1
O ₂	32.00	0.022	154.4	49.7	74.4
CO	28.01	0.048	132.9	34.5	93.1
CO ₂	44.01	0.224	304.2	72.8	94.1
NO	30.10	0.583	180.0	64.0	57.0
N ₂ O	44.01	0.141	309.7	71.7	96.3
SO ₂	64.06	0.245	430.7	77.8	122.0

(continued)

Table A.2 (continued)

Species	MW	ω	T_c K	P_c atm	V_c cm ³ /mol
Cl ₂	70.91	0.069	417.0	76.1	124.0
CH ₄	16.04	0.012	191.1	45.8	98.7
C ₂ H ₆	30.07	0.100	305.4	48.2	148.0
C ₃ H ₆	42.08	0.140	365.0	45.5	181.0
C ₃ H ₈	44.10	0.152	369.8	41.9	200.0
n-C ₄ H ₁₀	58.12	0.200	425.2	37.5	255.0
i-C ₄ H ₁₀	58.12	0.181	408.1	36.0	263.0
n-C ₅ H ₁₂	72.15	0.252	469.5	33.2	311.0
n-C ₆ H ₁₄	86.18	0.301	507.3	29.7	370.0
n-C ₇ H ₁₆	100.20	0.350	540.1	27.0	432.0
n-C ₈ H ₁₈	114.23	0.400	568.7	24.5	492.0
n-C ₉ H ₂₀	128.26	0.444	594.6	22.6	548.0
Cyclohexane	84.16	0.210	553.0	40.0	308.0
Benzene	78.11	0.210	562.6	48.6	260.0

Appendix B

Heat Capacities

See Tables B.1, B.2, B.3 and B.4.

Table B.1 Heat capacities in the ideal-gas state [1, 2]: $C_p^{ig}/R = A + BT + CT^2$ $T = 298$ K to T_{max} K

Chemical species	Formula	T_{max} K	C_p^{ig}/R 298 K	A	$10^3 B$	$10^6 C$
Methane	CH ₄	1500	4.217	1.702	9.081	-2.164
Ethane	C ₂ H ₆	1500	6.369	1.131	19.225	-5.561
Propane	C ₃ H ₈	1500	9.011	1.213	28.785	-8.824
Acetylene	C ₂ H ₂	26.04	0.906	191.7	191.7	672.0
Ethylene	C ₂ H ₄	28.05	0.975	104.0	169.5	481.2
n-Butane	C ₄ H ₁₀	1500	11.928	1.935	36.915	-11.402
n-Pentane	C ₅ H ₁₂	1500	14.731	2.464	45.351	-14.111
n-Hexane	C ₆ H ₁₄	1500	17.550	3.025	53.722	-16.791
n-Heptane	C ₇ H ₁₆	1500	20.361	3.570	62.127	-19.486
n-Octane	C ₈ H ₁₈	1500	23.174	4.108	70.567	-22.208
Benzene	C ₆ H ₆	1500	10.259	-0.206	39.064	-13.301
Cyclohexane	C ₆ H ₁₂	1500	13.121	-3.876	63.249	-20.928
Ethanol	C ₂ H ₆ O	1500	8.948	3.518	20.001	-6.002
Methanol	CH ₄ O	1500	5.547	2.211	12.216	-3.450
Toluene	C ₇ H ₈	1500	12.922	0.290	47.052	-15.716
Air		2000	3.509	3.355	0.575	.....
Ammonia	NH ₃	1800	4.269	3.578	3.020	.....
Carbon monoxide	CO	2500	3.507	3.376	0.557	.....
Carbon dioxide	CO ₂	2000	4.467	5.457	1.045	.....
Chlorine	Cl ₂	3000	4.082	4.442	0.089	.....
Hydrogen	H ₂	3000	3.468	3.249	0.422	.....
Nitrogen	N ₂	2000	3.502	3.280	0.593	.....
Nitrogen dioxide	NO ₂	2000	4.447	4.982	1.195	.....
Oxygen	O ₂	2000	3.535	3.639	0.506	.....
Sulfur dioxide	SO ₂	2000	4.796	5.699	0.801	.....
Sulfur trioxide	SO ₃	2000	6.094	8.060	1.056	.....
Water	H ₂ O	2000	4.038	3.470	1.450	.....

Table B.2 Heat capacities of liquids: constants for the equation [1, 2] $C_p/R = A + BT + CT^2$ (K); $T = 298$ K to T_{\max} K

Chemical species	$C_{p,298}$ K/R	A	$10^3 B$	$10^6 C$
Ammonia	9.718	22.626	-100.75	192.71
Aniline	23.070	15.819	29.03	-15.80
Benzene	16.157	-0.747	67.96	-37.78
Carbon tetrachloride	15.751	21.155	-48.28	101.14
Chlorobenzene	18.240	11.278	32.86	-31.90
Chloroform	13.806	19.215	-42.89	83.01
Cyclohexane	18.737	-9.048	141.38	-161.62
Ethanol	13.444	33.866	-172.60	349.17
Ethylene oxide	10.590	21.039	-86.41	172.28
Methanol	9.798	13.431	-51.28	131.13
n-Propanol	16.921	41.653	-210.32	427.20
Toluene	18.611	15.133	6.79	16.35
Water	9.069	8.712	1.25	-0.18

Table B.3 Heat capacities of solids⁺: constants for the equation [1, 2] $C_p/R = A + BT + CT^{-2}$: $T = 298$ K to T_{\max} K

Chemical species	T_{\max} K	$C_{p,298}/R$	A	$10^3 B$	$10^{-5} C$
CaO	2000	5.058	6.104	0.443	-1.047
CaCO ₃	1200	9.848	12.572	2.637	-3.120
CaCl ₂	1055	8.762	8.646	1.530	-0.302
C(graphite)	2000	1.026	1.771	0.771	-0.867
Cu	1357	2.959	2.677	0.815	0.035
CuO	1400	5.087	5.780	0.973	-0.874
Fe	1043	3.005	-0.111	6.111	1.150
FeS	411	6.573	2.612	13.286	
NH ₄ Cl	458	10.741	5.939	16.105	
NaOH	566	7.177	0.121	16.316	1.948
SiO ₂ (quartz)	847	5.345	4.871	5.365	-1.001

Table B.4 Ideal-gas specific heats of various common gases [1]

T K	C_p kJ/kg K	C_v kJ/kg K	γ	C_p kJ/kg K	C_v kJ/kg K	γ	C_p kJ/kg K	C_v kJ/kg K	γ	C_p kJ/kg K	C_v kJ/kg K	γ
Air												
250	1.003	0.716	1.401	0.791	0.602	1.314	1.039	0.743	1.400	1.039	0.743	1.400
300	1.005	0.718	1.400	0.846	0.657	1.288	1.040	0.744	1.399	1.040	0.744	1.399
350	1.008	0.721	1.398	0.895	0.706	1.268	1.043	0.746	1.398	1.043	0.746	1.398
400	1.013	0.726	1.395	0.939	0.750	1.252	1.047	0.751	1.395	1.047	0.751	1.395
450	1.020	0.733	1.391	0.978	0.790	1.239	1.054	0.757	1.392	1.054	0.757	1.392
500	1.029	0.742	1.387	1.014	0.825	1.229	1.063	0.767	1.387	1.063	0.767	1.387
550	1.040	0.753	1.381	1.046	0.857	1.220	1.075	0.778	1.382	1.075	0.778	1.382
600	1.051	0.764	1.376	1.075	0.886	1.213	1.087	0.790	1.376	1.087	0.790	1.376
650	1.063	0.776	1.370	1.102	0.913	1.207	1.100	0.803	1.370	1.100	0.803	1.370
700	1.075	0.788	1.364	1.126	0.937	1.202	1.113	0.816	1.364	1.113	0.816	1.364
750	1.087	0.800	1.359	1.148	0.959	1.197	1.126	0.829	1.358	1.126	0.829	1.358
800	1.099	0.812	1.354	1.169	0.980	1.193	1.139	0.842	1.353	1.139	0.842	1.353
900	1.121	0.834	1.344	1.204	1.015	1.186	1.163	0.866	1.343	1.163	0.866	1.343
1000	1.142	0.855	1.336	1.234	1.045	1.181	1.185	0.888	1.335	1.185	0.888	1.335
Hydrogen, H ₂												
Nitrogen, N ₂												
250	14.051	9.927	1.416	1.039	0.742	1.400	0.913	0.653	1.398	0.913	0.653	1.398
300	14.307	10.183	1.405	1.039	0.743	1.400	0.918	0.658	1.395	0.918	0.658	1.395
350	14.427	10.302	1.400	1.041	0.744	1.399	0.928	0.668	1.389	0.928	0.668	1.389
400	14.476	10.352	1.398	1.044	0.747	1.397	0.941	0.681	1.382	0.941	0.681	1.382
450	14.501	10.377	1.398	1.049	0.752	1.395	0.956	0.696	1.373	0.956	0.696	1.373
500	14.513	10.389	1.397	1.056	0.759	1.391	0.972	0.712	1.365	0.972	0.712	1.365
550	14.530	10.405	1.396	1.065	0.768	1.387	0.988	0.728	1.358	0.988	0.728	1.358
600	14.546	10.422	1.396	1.075	0.778	1.382	1.003	0.743	1.350	1.003	0.743	1.350

(continued)

Table B.4 (continued)

T K	C_p kJ/kg K	C_v kJ/kg K	γ	C_p kJ/kg K	C_v kJ/kg K	γ	C_p kJ/kg K	C_v kJ/kg K	γ
650	14.571	10.447	1.395	1.086	0.789	1.376	1.017	0.758	1.343
700	14.604	10.480	1.394	1.098	0.801	1.371	1.031	0.771	1.337
750	14.645	10.521	1.392	1.110	0.813	1.365	1.043	0.783	1.332
800	14.695	10.570	1.390	1.121	0.825	1.360	1.054	0.794	1.327
900	14.822	10.698	1.385	1.145	0.849	1.349	1.074	0.814	1.319
1000	14.983	10.859	1.380	1.167	0.870	1.341	1.090	0.830	1.313

Appendix C

Enthalpies and Gibbs Energies of Formation

See Table C.1.

Table C.1 Standard enthalpies and Gibbs energies of formation at 298.15 K [2, 3]

Chemical species	Formula	State	$\Delta H_{f,298}$ kJ/mol	$\Delta G_{f,298}$ kJ/mol
Methane	CH ₄	(g)	-74.520	-50.460
Ethane	C ₂ H ₆	(g)	-83.820	-31.855
Propane	C ₃ H ₈	(g)	-104.680	-24.290
n-Butane	C ₄ H ₁₀	(g)	-125.790	-16.570
n-Pentane	C ₅ H ₁₂	(g)	-146.760	-8.650
Benzene	C ₆ H ₆	(g)	82.930	129.665
Benzene	C ₆ H ₆	(l)	49.080	124.520
Cyclohexane	C ₆ H ₁₂	(g)	-123.140	31.920
Cyclohexane	C ₆ H ₁₂	(l)	-156.230	26.850
Ethanol	C ₂ H ₆ O	(g)	-235.100	-168.490
Ethanol	C ₂ H ₆ O	(l)	-277.690	-174.780
Methanol	CH ₄ O	(g)	-200.660	-161.960
Methanol	CH ₄ O	(l)	-238.660	-166.270
Toluene	C ₇ H ₈	(g)	50.170	122.050
Toluene	C ₇ H ₈	(l)	12.180	113.630
Ammonia	NH ₃	(g)	-46.110	-16.450
Calcium carbonate	CaCO ₃	(s)	-1206.920	-1128.790
Calcium oxide	CaO	(s)	-635.090	-604.030
Carbon dioxide	CO ₂	(g)	-393.509	-394.359
Carbon monoxide	CO	(g)	-110.525	-137.169
Hydrochloric acid	HCl	(g)	-92.307	-95.299
Hydrogen sulfide	H ₂ S	(g)	-20.630	-33.560
Iron oxide	FeO	(s)	-272.000	
Nitric acid	HNO ₃	(l)	-174.100	-80.710

(continued)

Table C.1 (continued)

Chemical species	Formula	State	$\Delta H_{f,298}$ kJ/mol	$\Delta G_{f,298}$ kJ/mol
Nitrogen oxides	NO	(g)	90.250	86.550
	NO ₂	(g)	33.180	51.310
Sodium carbonate	Na ₂ CO ₃	(s)	-1130.680	-1044.440
Sodium chloride	NaCl	(s)	-411.153	-384.138
Sodium hydroxide	NaOH	(s)	-425.609	-379.494
Sulfur dioxide	SO ₂	(g)	-296.830	-300.194
Sulfur trioxide	SO ₃	(g)	-395.720	-371.060
Sulfur trioxide	SO ₃	(l)	-441.040	
Water	H ₂ O	(g)	-241.818	-228.572
Water	H ₂ O	(l)	-285.830	-237.129

Appendix D

Ideal Gas Properties of Some Common Gases

See Tables D.1, D.2 and D.3.

Table D.1 Ideal-gas properties of air [1]

T K	H kJ/kg	P_r	U kJ/kg	V_r	S kJ/kg K
270	270.11	0.9590	192.60	808.0	1.596
280	280.13	1.0889	199.75	783.0	1.632
285	285.14	1.1584	203.33	706.1	1.650
290	290.16	1.2311	206.91	676.1	1.668
295	295.17	1.3068	210.49	647.9	1.685
300	300.19	1.3860	214.07	621.2	1.702
305	305.22	1.4686	217.67	596.0	1.718
310	310.24	1.5546	221.25	572.3	1.734
315	315.27	1.6442	224.85	549.8	1.751
320	320.29	1.7375	228.42	528.6	1.766
325	325.31	1.8345	232.02	508.4	1.782
330	330.34	1.9352	235.61	489.4	1.797
340	340.42	2.149	242.82	454.1	1.827
350	350.49	2.379	250.02	422.2	1.857
360	360.58	2.626	257.24	393.4	1.885
370	370.67	2.892	264.46	367.2	1.913
380	380.77	3.176	271.69	343.4	1.940
390	390.88	3.481	278.93	321.5	1.966
400	400.98	3.806	286.16	301.6	1.991
410	411.12	4.153	293.43	283.3	2.016
420	421.26	4.522	300.69	266.6	2.041
430	431.43	4.915	307.99	251.1	2.065
440	441.61	5.332	315.30	236.8	2.088
450	451.80	5.775	322.62	223.6	2.111
460	462.02	6.245	329.97	211.4	2.134
470	472.24	6.742	337.32	200.1	2.156

(continued)

Table D.1 (continued)

T K	H kJ/kg	P_r	U kJ/kg	V_r	S kJ/kg K
480	482.49	7.268	344.70	189.5	2.177
490	492.74	7.824	352.08	179.7	2.198
500	503.02	8.411	359.49	170.6	2.219
510	513.32	9.031	366.92	162.1	2.239
520	523.63	9.684	374.36	154.1	2.259
530	533.98	10.37	381.84	146.7	2.279
540	544.35	11.10	389.34	139.7	2.299
550	555.74	11.86	396.86	133.1	2.318
560	565.17	12.66	404.42	127.0	2.336
570	575.59	13.50	411.97	121.2	2.355
580	586.04	14.38	419.55	115.7	2.373
590	596.52	15.31	427.15	110.6	2.391
600	607.02	16.28	434.78	105.8	2.409
610	617.53	17.30	442.42	101.2	2.426
620	628.07	18.36	450.09	96.92	2.443
630	683.63	19.84	457.78	92.84	2.460
640	649.22	20.64	465.50	88.99	2.477
650	659.84	21.86	473.25	85.34	2.493
660	670.47	23.13	481.01	81.89	2.509
670	681.14	24.46	488.81	78.61	2.525
680	691.82	25.85	496.62	75.50	2.541
690	702.52	27.29	504.45	72.56	2.557
700	713.27	28.80	512.33	69.76	2.572
710	724.04	30.38	520.23	67.07	2.588
720	734.82	32.02	528.14	64.53	2.603
730	745.62	33.72	536.07	62.13	2.618
740	756.44	35.50	544.02	59.82	2.632
750	767.29	37.35	551.99	57.63	2.647
760	778.18	39.27	560.01	55.54	2.661
780	800.03	43.35	576.12	51.64	2.690
800	821.95	47.75	592.30	48.08	2.717
820	843.98	52.59	608.59	44.84	2.745
840	866.08	57.60	624.95	41.85	2.771
860	888.27	63.09	641.40	39.12	2.797
880	910.56	68.98	657.95	36.61	2.823
900	932.93	75.29	674.58	34.31	2.848
920	955.38	82.05	691.28	32.18	2.873
940	977.92	89.28	708.08	30.22	2.897
960	1000.55	97.00	725.02	28.40	2.921
980	1023.25	105.2	741.98	26.73	2.944

(continued)

Table D.1 (continued)

T K	H kJ/kg	P_r	U kJ/kg	V_r	S kJ/kg K
1000	1046.04	114.0	758.94	25.17	2.967
1020	1068.89	123.4	776.10	23.72	2.990
1040	1091.85	133.3	793.36	23.29	3.012
1060	1114.86	143.9	810.62	21.14	3.034
1080	1137.89	155.2	827.88	19.98	3.056
1100	1161.07	167.1	845.33	18.896	3.077
1120	1184.28	179.7	862.79	17.886	3.098
1140	1207.57	193.1	880.35	16.946	3.118
1160	1230.92	207.2	897.91	16.064	3.139
1180	1254.34	222.2	915.57	15.241	3.159
1200	1277.79	238.0	933.33	14.470	3.178
1220	1301.31	254.7	951.09	13.747	3.198
1240	1324.93	272.3	968.95	13.069	3.217
1260	1348.55	290.8	986.90	12.435	3.236
1280	1372.24	310.4	1004.76	11.835	3.255
1300	1395.97	330.9	1022.82	11.275	3.273
1320	1419.76	352.5	1040.88	10.747	3.291
1340	1443.60	375.3	1058.94	10.247	3.309
1360	1467.49	399.1	1077.10	9.780	3.327
1400	1515.42	450.5	1113.52	8.919	3.362
1460	1587.63	537.1	1168.49	7.801	3.412
1500	1635.97	601.9	1205.41	7.152	3.445
1560	1708.82	710.5	1260.99	6.301	3.492
1600	1757.57	791.2	1298.30	5.804	3.523
1640	1806.46	878.9	1335.72	5.355	3.553
1700	1880.1	1025	1392.7	4.761	3.597
1750	1941.6	1161	1439.8	4.328	3.633
1800	2003.3	1310	1487.2	3.994	3.668
1850	2065.3	1475	1534.9	3.601	3.702
1900	2127.4	1655	1582.6	3.295	3.735
1950	2189.7	1852	1630.6	3.022	3.767
2000	2252.1	2068	1678.8	2.776	3.799
2100	2377.7	2559	1775.3	2.356	3.860

Table D.2 Ideal-gas properties of carbon dioxide, CO₂ [1]

<i>T</i> K	<i>H</i> kJ/kmol	<i>U</i> kJ/kmol	<i>S</i> kJ/kmol K	<i>T</i> K	<i>H</i> kJ/kmol	<i>U</i> kJ/kmol	<i>S</i> kJ/kmol K
0	0,000	0,000	0.000	600	22,280	17,291	243.199
220	6,601	4,772	202.966	610	22,754	17,683	243.983
230	6,938	5,026	204.464	620	23,231	18,076	244.758
240	7,280	5,285	205.920	630	23,709	18,471	245.524
250	7,627	5,548	207.337	640	24,190	18,869	246.282
260	7,979	5,817	208.717	650	24,674	19,270	247.032
270	8,335	6,091	210.062	660	25,160	19,672	247.773
280	8,697	6,369	211.376	670	25,648	20,078	248.507
290	9,063	6,651	212.660	680	26,138	20,484	249.233
298	9,364	6,885	213.685	690	26,631	20,894	249.952
300	9,431	6,939	213.915	700	27,125	21,305	250.663
310	9,807	7,230	215.146	710	27,622	21,719	251.368
320	10,186	7,526	216.351	720	28,121	22,134	252.065
330	10,570	7,826	217.534	730	28,622	22,522	252.755
340	10,959	8,131	218.694	740	29,124	22,972	253.439
350	11,351	8,439	219.831	750	29,629	23,393	254.117
360	11,748	8,752	220.948	760	20,135	23,817	254.787
370	12,148	9,068	222.044	770	30,644	24,242	255.452
380	12,552	9,392	223.122	780	31,154	24,669	256.110
390	12,960	9,718	224.182	790	31,665	25,097	256.762
400	13,372	10,046	225.225	800	32,179	25,527	257.408
410	13,787	10,378	226.250	810	32,694	25,959	258.048
420	14,206	10,714	227.258	820	33,212	26,394	258.682
430	14,628	11,053	228.252	830	33,730	26,829	259.311
440	15,054	11,393	229.230	840	34,251	27,267	259.934
450	15,483	11,742	230.194	850	34,773	27,706	260.551
460	15,916	12,091	231.144	860	35,296	28,125	261.164
470	16,351	12,444	232.080	870	35,821	28,588	261.770
480	16,791	12,800	233.004	880	36,347	29,031	262.371
490	17,232	13,158	233.916	890	36,876	29,476	262.968
500	17,678	13,521	234.814	900	37,405	29,922	263.559
510	18,126	13,885	235.700	910	37,935	30,369	264.146
520	18,576	14,253	236.575	920	38,467	30,818	264.728
530	19,029	14,622	237.439	930	39,000	31,268	265.304
540	19,485	14,996	238.292	940	39,535	31,719	265.877
550	19,945	15,372	239.135	950	40,070	32,171	266.444
560	20,407	15,751	239.962	960	40,607	32,625	267.007
570	20,870	16,131	240.789	970	41,145	33,081	267.566
580	21,337	16,515	241.602	980	41,685	33,537	268.119
590	21,807	16,902	242.405	990	42,226	33,995	268.670

Table D.3 Ideal-gas properties of hydrogen, H₂ [1]

<i>T</i> K	<i>H</i> kJ/kmol	<i>U</i> kJ/kmol	<i>S</i> kJ/kmol K	<i>T</i> K	<i>H</i> kJ/kmol	<i>U</i> kJ/kmol	<i>S</i> kJ/kmol K
0	0,000	0,000	0.000	1440	42,808	30,835	177.410
260	7,370	5,209	126.636	1480	44,091	31,786	178.291
270	7,657	5,412	127.719	1520	45,384	32,746	179.153
280	7,945	5,617	128.765	1560	46,683	33,713	179.995
290	8,233	5,822	129.775	1600	47,990	34,687	180.820
298	8,468	5,989	130.574	1640	49,303	35,668	181.632
300	8,522	6,027	130.754	1680	50,622	36,654	182.428
320	9,100	6,440	132.621	1720	51,947	37,646	183.208
340	9,680	6,853	134.378	1760	53,279	38,645	183.973
360	10,262	7,268	136.039	1800	54,618	39,652	184.724
380	10,843	7,684	137.612	1840	55,962	40,663	185.463
400	11,426	8,100	139.106	1880	57,311	41,680	186.190
420	12,010	8,518	140.529	1920	58,668	42,705	186.904
440	12,594	8,936	141.888	1960	60,031	43,735	187.607
460	13,179	9,355	143.187	2000	61,400	44,771	188.297
480	13,764	9,773	144.432	2050	63,119	46,074	189.148
500	14,350	10,193	145.628	2100	64,847	47,386	189.979
520	14,935	10,611	146.775	2150	66,584	48,708	190.796
560	16,107	11,451	148.945	2200	68,328	50,037	191.598
600	17,280	12,291	150.968	2250	70,080	51,373	192.385
640	18,453	13,133	152.863	2300	71,839	52,716	193.159
680	19,630	13,976	154.645	2350	73,608	54,069	193.921
720	20,807	14,821	156.328	2400	75,383	55,429	194.669
760	21,988	15,669	157.923	2450	77,168	56,798	195.403
800	23,171	16,520	159.440	2500	78,960	58,175	196.125
840	24,359	17,375	160.891	2550	80,755	59,554	196.837
880	25,551	18,235	162.277	2600	82,558	60,941	197.539
920	26,747	19,098	163.607	2650	84,368	62,335	198.229
960	27,948	19,966	164.884	2700	86,186	63,737	198.907
1000	29,154	20,839	166.114	2750	88,008	65,144	199.575
1040	30,364	21,717	167.300	2800	89,838	66,558	200.234
1080	31,580	22,601	168.449	2850	91,671	67,976	200.885
1120	32,802	23,490	169.560	2900	93,512	69,401	201.527
1160	34,028	24,384	170.636	2950	95,358	70,831	202.157
1200	35,262	25,284	171.682	3000	97,211	72,268	202.778
1240	36,502	26,192	172.698	3050	99,065	73,707	203.391
1280	37,749	27,106	173.687	3100	100,926	75,152	203.995
1320	39,002	28,027	174.652	3150	102,793	76,604	204.592
1360	40,263	28,955	175.593	3200	104,667	78,061	205.181
1400	41,530	29,889	176.510	3250	106,545	79,523	205.765

Appendix E

Thermochemical Properties

See Tables E.1, E.2, E.3 and E.4.

Table E.1 Saturated refrigerant-134a [1]

T °F	P_{sat} psia	V ft ³ /lb		U Btu/lb		H Btu/lb		S Btu/lb R	
		V_l	V_g	U_l	U_g	H_l	H_g	S_l	S_g
-40	7.490	0.01130	5.7173	-0.02	87.90	0.00	95.82	0.0000	0.2283
-30	9.920	0.01143	4.3911	2.81	89.26	2.83	97.32	0.0067	0.2266
-20	12.949	0.01156	3.4173	5.69	90.62	5.71	98.81	0.0133	0.2250
-15	14.718	0.01163	3.0286	7.14	91.30	7.17	99.55	0.0166	0.2243
-10	16.674	0.01170	2.6918	8.61	91.98	8.65	100.29	0.0199	0.2236
-5	18.831	0.01178	2.3992	10.09	92.66	10.13	101.02	0.0231	0.2230
0	21.203	0.01185	2.1440	11.58	93.33	11.63	101.75	0.0264	0.2224
5	23.805	0.01193	1.9208	13.09	94.01	13.14	102.47	0.0296	0.2219
10	26.651	0.01200	1.7251	14.60	94.68	14.66	103.19	0.0329	0.2214
15	29.756	0.01208	1.5529	16.13	95.35	16.20	103.90	0.0361	0.2209
20	33.137	0.01216	1.4009	17.67	96.02	17.74	104.61	0.0393	0.2205
25	36.809	0.01225	1.2666	19.22	96.69	19.30	105.32	0.0426	0.2200
30	40.788	0.01233	1.1474	20.78	97.35	20.87	106.01	0.0458	0.2196
40	49.738	0.01251	0.9470	23.94	98.67	24.05	107.39	0.0522	0.2189
50	60.125	0.01270	0.7871	27.14	99.98	27.28	108.74	0.0585	0.2183
60	72.092	0.01290	0.6584	30.39	101.27	30.56	110.05	0.0648	0.2178
70	85.788	0.01311	0.5538	33.68	102.54	33.89	111.33	0.0711	0.2173
80	101.370	0.01334	0.4682	37.02	103.78	37.27	112.56	0.0774	0.2169
85	109.920	0.01346	0.4312	38.72	104.39	38.99	113.16	0.0805	0.2167

(continued)

Table E.1 (continued)

T °F	P_{sat} psia	V ft ³ /lb		U Btu/lb		H Btu/lb		S Btu/lb R	
		V_l	V_g	U_l	U_g	H_l	H_g	S_l	S_g
90	118.990	0.01358	0.3975	40.42	105.00	40.72	113.75	0.0836	0.2165
95	128.620	0.01371	0.3668	42.14	105.60	42.47	114.33	0.0867	0.2163
100	138.830	0.01385	0.3388	43.87	106.18	44.23	114.89	0.0898	0.2161
105	149.630	0.01399	0.3131	45.62	106.76	46.01	115.43	0.0930	0.2159
110	161.040	0.01414	0.2896	47.39	107.33	47.81	115.96	0.0961	0.2157
115	173.100	0.01429	0.2680	49.17	107.88	49.63	116.47	0.0992	0.2155
120	185.820	0.01445	0.2481	50.97	108.42	51.47	116.95	0.1023	0.2153
140	243.860	0.01520	0.1827	58.39	110.41	59.08	118.65	0.1150	0.2143
160	314.630	0.01617	0.1341	66.26	111.97	67.20	119.78	0.1280	0.2128
180	400.220	0.01758	0.0964	74.83	112.77	76.13	119.91	0.1417	0.2101
200	503.520	0.02014	0.0647	84.90	111.66	86.77	117.69	0.1575	0.2044
210	563.510	0.02329	0.0476	91.84	108.48	94.27	113.45	0.1684	0.1971

Table E.2 Superheated refrigerated R-134a [1]

T °F	P = 10 psia (T _{sat} = -29.7 °F)			P = 15 psia (T _{sat} = -14.3 °F)			P = 20 psia (T _{sat} = -9.7 °F)					
	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R
Sat	4.358	89.3	97.3	0.226	2.974	91.4	99.7	0.224	2.266	93.0	101.3	0.222
0	4.702	94.2	102.9	0.239	3.089	93.8	102.4	0.230	2.281	93.4	101.8	0.223
20	4.929	97.6	106.8	0.247	3.246	97.3	106.3	0.238	2.404	96.9	105.8	0.232
40	5.154	101.2	110.7	0.255	3.401	100.9	110.3	0.246	2.524	100.6	109.9	0.240
60	5.375	104.8	114.7	0.263	3.553	104.5	114.4	0.254	2.641	104.2	114.0	0.248
80	5.596	108.5	118.8	0.271	3.703	108.2	118.5	0.262	2.757	108.0	118.2	0.256
100	5.814	112.3	123.0	0.278	3.852	112.1	122.8	0.270	2.870	111.9	122.5	0.264
120	6.032	116.2	127.3	0.286	3.999	116.0	127.1	0.278	2.983	115.8	126.8	0.272
140	6.248	120.1	131.7	0.293	4.145	120.0	131.5	0.285	3.094	119.8	131.3	0.279
160	6.464	124.2	136.2	0.301	4.291	124.1	136.0	0.292	3.204	123.9	135.8	0.286
180	6.678	128.4	140.7	0.308	4.436	128.2	140.5	0.300	3.314	128.1	140.4	0.292
200	6.893	132.6	145.4	0.315	4.580	132.5	145.2	0.307	3.423	132.4	145.0	0.301
	P = 30 psia (T _{sat} = -29.7 °F)											
Sat	1.540	95.4	103.9	0.220	1.169	97.3	105.88	0.2197	0.942	98.71	107.4	0.218
40	1.646	99.9	109.1	0.231	1.206	99.3	108.26	0.2245				
60	1.729	103.7	113.3	0.239	1.272	103.2	112.62	0.2331	0.997	102.62	111.8	0.227
80	1.809	107.5	117.6	0.247	1.335	107.1	117.00	0.2414	1.050	106.62	116.3	0.236
100	1.888	111.4	121.9	0.255	1.397	111.0	121.42	0.2494	1.102	110.65	120.8	0.244
120	1.966	115.4	126.3	0.263	1.457	115.1	125.90	0.2573	1.152	114.74	125.3	0.252
140	2.042	119.5	130.8	0.271	1.516	119.2	130.43	0.2650	1.200	118.88	129.9	0.260
160	2.118	123.6	135.4	0.278	1.574	123.3	135.03	0.2725	1.284	123.08	134.6	0.267
180	2.192	127.8	140.0	0.285	1.631	127.6	139.70	0.2799	1.295	127.36	139.3	0.275
200	2.267	132.1	144.7	0.293	1.688	131.9	144.44	0.2872	1.341	131.71	144.1	0.282

(continued)

Table E.2 (continued)

T °F	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R
220	2.340	136.5	149.5	0.300	1.744	136.3	149.25	0.2944	1.387	136.12	148.9	0.289
240					1.800	140.8	154.14	0.3015	1.432	140.61	153.8	0.296
260					1.856	145.3	159.10	0.3085	1.477	145.18	158.8	0.303
280					1.911	149.9	164.13	0.3154	1.522	149.82	163.9	0.310
$P = 60$ psia ($T_{\text{sat}} = 49.9$ °F)												
Sat	0.788	100.0	108.7	0.218	0.677	101.0	109.83	0.2179	0.593	102.02	110.8	0.217
60	0.813	102.0	111.0	0.222	0.681	101.4	110.23	0.2186				
80	0.860	106.1	115.6	0.231	0.723	105.5	114.96	0.2276	0.621	105.03	114.2	0.223
100	0.905	110.2	120.2	0.239	0.764	109.7	119.66	0.2361	0.657	109.30	119.0	0.232
120	0.948	114.3	124.8	0.248	0.802	113.9	124.36	0.2444	0.692	113.56	123.8	0.241
140	0.990	118.5	129.5	0.255	0.839	118.2	129.07	0.2524	0.726	117.85	128.6	0.249
160	1.030	122.7	134.2	0.263	0.875	122.4	133.82	0.2601	0.758	122.18	133.4	0.257
180	1.070	127.1	138.9	0.271	0.910	126.8	138.62	0.2678	0.789	126.55	138.2	0.264
200	1.110	131.4	143.7	0.278	0.944	131.2	143.46	0.2752	0.820	130.98	143.1	0.272
220	1.148	135.9	148.6	0.285	0.978	135.6	148.36	0.2825	0.850	135.47	148.0	0.279
240	1.187	140.4	153.6	0.293	1.011	140.2	153.33	0.2897	0.880	140.02	153.0	0.286
260	1.225	145.0	158.6	0.300	1.044	144.8	158.35	0.2968	0.909	144.63	158.1	0.294
280	1.262	149.6	163.6	0.307	1.077	149.4	163.44	0.3038	0.938	149.32	163.2	0.301
300	1.300	154.3	168.8	0.313	1.109	154.2	168.60	0.3107	0.967	154.06	168.3	0.307
$P = 90$ psia ($T_{\text{sat}} = 72.8$ °F)												
Sat	0.527	102.8	111.6	0.217	0.474	103.6	112.46	0.2169	0.394	105.06	113.8	0.216
80	0.540	104.4	113.4	0.220	0.476	103.8	112.68	0.2173				
100	0.575	108.8	118.3	0.229	0.508	108.3	117.73	0.2265	0.408	107.26	116.3	0.221
120	0.607	113.1	123.2	0.238	0.538	112.7	122.70	0.2352	0.435	111.84	121.5	0.230

(continued)

Table E.2 (continued)

T °F	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R
140	0.638	117.5	128.1	0.246	0.567	117.1	127.63	0.2436	0.461	116.37	126.6	0.238
160	0.667	121.8	132.9	0.254	0.594	121.5	132.55	0.2517	0.482	120.89	131.6	0.247
180	0.696	126.2	137.8	0.262	0.621	125.9	137.49	0.2595	0.508	125.42	136.7	0.255
200	0.723	130.7	142.7	0.269	0.646	130.4	142.45	0.2671	0.530	129.97	141.7	0.262
220	0.751	135.2	147.7	0.277	0.671	135.0	147.45	0.2746	0.552	134.56	146.8	0.270
240	0.777	139.8	152.7	0.284	0.696	139.6	152.49	0.2819	0.573	139.20	151.9	0.277
260	0.804	144.4	157.8	0.291	0.720	144.2	157.59	0.2891	0.593	143.89	157.0	0.285
280	0.830	149.1	162.9	0.298	0.743	148.9	162.74	0.2962	0.614	148.63	162.2	0.292
300	0.856	153.9	168.1	0.305	0.767	153.7	167.95	0.3031	0.633	153.43	167.5	0.299
320	0.881	158.7	173.4	0.312	0.790	158.5	173.21	0.3099	0.653	158.29	172.8	0.306
$P = 140$ psia ($T_{\text{sat}} = 100.6$ °F)												
Sat	0.335	106.2	114.9	0.216	0.291	107.2	115.91	0.2157	0.256	108.18	116.7	0.215
120	0.361	110.9	120.2	0.225	0.304	109.8	118.89	0.2209	0.259	108.77	117.4	0.216
140	0.384	115.5	125.2	0.234	0.326	114.7	124.41	0.2303	0.281	113.83	123.2	0.226
160	0.406	120.2	130.7	0.242	0.347	119.4	129.78	0.2391	0.301	118.74	128.7	0.235
180	0.427	124.8	135.8	0.251	0.366	124.2	135.06	0.2475	0.319	123.56	134.1	0.244
200	0.447	129.4	141.0	0.259	0.384	128.9	140.29	0.2555	0.336	128.34	139.5	0.252
220	0.466	134.0	146.1	0.266	0.402	133.6	145.52	0.2633	0.352	133.11	144.8	0.260
240	0.485	138.7	151.3	0.274	0.419	138.3	150.75	0.2709	0.367	137.90	150.1	0.268
260	0.503	143.5	156.5	0.281	0.435	143.1	156.00	0.2783	0.382	142.71	155.4	0.275
280	0.521	148.2	161.7	0.288	0.451	147.9	161.29	0.2856	0.397	147.55	160.7	0.282
300	0.538	153.1	167.0	0.295	0.467	152.7	166.61	0.2927	0.411	152.44	166.1	0.289
320	0.555	157.9	172.3	0.302	0.482	157.6	171.98	0.2996	0.425	157.38	171.5	0.296
340	0.573	162.9	177.7	0.309	0.497	162.6	177.39	0.3065	0.439	162.36	177.0	0.303

(continued)

Table E.2 (continued)

T °F	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R
360	0.589	167.9	183.2	0.316	0.512	167.6	182.85	0.3132	0.452	167.40	182.4	0.310
	$P = 200$ psia ($T_{\text{sat}} = 125.3$ °F)											
Sat	0.228	108.9	117.4	0.215	0.142	111.7	119.62	0.2132	0.096	112.77	119.9	0.210
160	0.263	117.9	127.7	0.232	0.146	112.9	121.07	0.2155				
180	0.280	122.8	133.2	0.241	0.163	118.9	128.00	0.2265	0.096	112.79	119.9	0.210
200	0.297	127.7	138.7	0.249	0.177	124.4	134.34	0.2363	0.114	120.14	128.6	0.223
220	0.312	132.6	144.1	0.257	0.190	129.7	140.36	0.2453	0.127	126.35	135.7	0.234
240	0.326	137.4	149.5	0.265	0.202	134.9	146.21	0.2537	0.138	132.12	142.3	0.243
260	0.340	142.3	154.9	0.272	0.213	140.1	151.95	0.2618	0.148	137.65	148.6	0.252
280	0.354	147.1	160.2	0.280	0.223	145.2	157.63	0.2696	0.157	143.06	154.7	0.261
300	0.367	152.1	165.6	0.287	0.233	150.3	163.28	0.2772	0.166	148.39	160.6	0.268
320	0.379	157.0	171.1	0.294	0.242	155.4	168.92	0.2845	0.174	153.69	166.5	0.276
340	0.392	162.0	176.6	0.301	0.252	160.5	174.56	0.2916	0.181	158.97	172.4	0.284
360	0.405	167.1	182.1	0.308	0.261	165.7	180.23	0.2986	0.189	164.26	178.2	0.291

Table E.3 Saturated propane [1]

T °F	P_{sat} psia	V ft ³ /lb		U Btu/lb		H Btu/lb		S Btu/lb R	
		V_l	V_g	U_l	U_g	H_l	H_g	S_l	S_g
-140	0.6	0.02505	128.0000	-51.33	139.22	-51.33	153.6	-0.139	0.501
-120	1.4	0.02551	58.8800	-41.44	143.95	-41.43	159.1	-0.109	0.481
-100	2.9	0.02601	29.9300	-31.34	148.80	-31.33	164.8	-0.080	0.465
-80	5.5	0.02653	16.5200	-21.16	153.73	-21.13	170.5	-0.053	0.452
-60	9.7	0.02708	9.7500	-10.73	158.74	-10.68	176.2	-0.026	0.441
-40	16.1	0.02767	6.0800	-0.08	163.80	0.00	181.9	0.000	0.433
-20	25.4	0.02831	3.9800	10.81	168.88	10.94	187.6	0.025	0.427
0	38.4	0.02901	2.7000	21.98	174.01	22.19	193.2	0.050	0.422
10	46.5	0.02939	2.2500	27.69	176.61	27.94	196.0	0.063	0.420
20	55.8	0.02978	1.8900	33.47	179.15	33.78	198.7	0.074	0.418
30	66.5	0.03020	1.5980	39.34	181.71	39.71	201.4	0.087	0.417
40	78.6	0.03063	1.3590	45.30	184.30	45.75	204.1	0.099	0.415
50	92.3	0.03110	1.1610	51.36	186.74	51.89	206.6	0.111	0.414
60	107.7	0.03160	0.9969	57.53	189.30	58.16	209.2	0.123	0.413
70	124.9	0.03213	0.8593	63.81	191.71	64.55	211.6	0.135	0.412
80	144.0	0.03270	0.7433	70.20	194.16	71.07	214.0	0.147	0.411
90	165.2	0.03332	0.6447	76.72	196.46	77.74	216.2	0.159	0.410
100	188.6	0.03399	0.5605	83.38	198.71	84.56	218.3	0.171	0.410
110	214.3	0.03473	0.4881	90.19	200.91	91.56	220.3	0.183	0.409
120	242.5	0.03555	0.4254	97.16	202.98	98.76	222.1	0.195	0.408
130	273.3	0.03646	0.3707	104.33	204.92	106.17	223.7	0.207	0.406
140	306.9	0.03749	0.3228	111.70	206.64	113.83	225.0	0.220	0.405
150	343.5	0.03867	0.2804	119.33	208.05	121.79	225.9	0.233	0.403
160	383.3	0.04006	0.2426	127.27	209.16	130.11	226.4	0.246	0.401
170	426.5	0.04176	0.2085	135.60	209.81	138.90	226.3	0.259	0.398
180	473.4	0.04392	0.1771	144.50	209.76	148.35	225.3	0.273	0.394
190	524.3	0.04696	0.1470	154.38	208.51	158.94	222.8	0.289	0.387
200	579.7	0.05246	0.1148	166.65	204.16	172.28	216.5	0.309	0.376
206.1	616.1	0.07265	0.0726	186.99	186.99	195.27	195.3	0.343	0.343

Table E.4 Superheated propane [1]

T °F	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R
	$P = 0.75$ psia ($T_{\text{sat}} = -135.1$ °F)				$P = 1.5$ psia ($T_{\text{sat}} = -118.1$ °F)			
Sat	104.8	140.4	154.9	0.496	54.99	144.4	159.7	0.479
-110	113.1	146.6	162.3	0.518	56.33	146.5	162.1	0.486
-90	119.6	151.8	168.4	0.535	59.63	151.7	168.2	0.503
-70	126.1	157.2	174.7	0.551	62.92	157.1	174.5	0.520
-50	132.7	162.7	181.2	0.568	66.20	162.6	181.0	0.536
-30	139.2	168.6	187.9	0.584	69.47	168.4	187.7	0.552
-10	145.7	174.4	194.7	0.599	72.74	174.4	194.6	0.568
10	152.2	180.7	201.9	0.615	76.01	180.7	201.8	0.583
30	158.7	187.1	209.2	0.630	79.27	187.1	209.1	0.599
50	165.2	193.8	216.8	0.645	82.53	193.8	216.7	0.614
70	171.7	200.7	224.6	0.660	85.79	200.7	224.5	0.629
90	178.2	207.8	232.6	0.675	89.04	207.8	232.5	0.644
	$P = 5.0$ psia ($T_{\text{sat}} = -83.0$ °F)				$P = 10.0$ psia ($T_{\text{sat}} = -58.8$ °F)			
Sat	18.00	153.0	169.6	0.454	9.47	159.0	176.6	0.441
-40	20.17	165.1	183.8	0.489	9.96	80.9	99.3	1.388
-20	21.17	171.1	190.7	0.505	10.47	86.9	106.3	1.405
0	22.17	172.2	197.7	0.521	10.98	93.1	113.4	1.421
20	23.16	183.5	205.0	0.536	11.49	99.5	120.8	1.436
40	24.15	190.1	212.5	0.552	11.99	106.1	128.3	1.452
60	25.14	196.9	220.2	0.567	12.49	113.0	136.1	1.467
80	26.13	204.0	228.2	0.582	12.99	120.0	144.1	1.482
100	27.11	211.3	236.4	0.597	13.49	127.3	152.3	1.497
120	28.09	218.8	244.8	0.611	13.99	134.9	160.7	1.512
140	29.07	226.5	253.4	0.626	14.48	142.6	169.4	1.526
	$P = 20.0$ psia ($T_{\text{sat}} = -30.7$ °F)				$P = 40.0$ psia ($T_{\text{sat}} = 2.1$ °F)			
Sat	4.971	166.2	184.6	0.430	2.594	174.6	193.8	0.422
20	5.648	182.4	203.3	0.471	2.723	180.6	200.8	0.436
40	5.909	189.1	211.0	0.487	2.864	187.6	208.8	0.453
60	6.167	195.9	218.8	0.502	3.002	194.6	216.9	0.469
80	6.424	203.1	226.9	0.518	3.137	201.8	225.1	0.484
100	6.678	210.5	235.2	0.533	3.271	209.4	233.6	0.500
120	6.932	218.0	243.7	0.548	3.403	217.0	242.2	0.515
140	7.184	225.8	252.4	0.562	3.534	224.9	251.1	0.530
160	7.435	233.9	261.4	0.577	3.664	232.9	260.1	0.545
180	7.685	242.1	270.6	0.592	3.793	241.3	269.4	0.559
200	7.935	250.6	280.0	0.606	3.921	249.8	278.9	0.574

(continued)

Table E.4 (continued)

T °F	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /kg	U Btu/lb	H Btu/lb	S Btu/lb R
	$P = 60.0$ psia ($T_{\text{sat}} = 24.1$ °F)				$P = 80.0$ psia ($T_{\text{sat}} = 41.1$ °F)			
Sat	1.764	180.2	199.8	0.418	1.336	184.6	204.3	0.415
50	1.894	189.5	210.6	0.400	1.372	187.9	208.2	0.423
70	1.992	196.9	219.0	0.417	1.450	195.4	216.9	0.440
90	2.087	204.4	227.6	0.432	1.526	203.1	225.7	0.456
110	2.179	212.1	236.3	0.448	1.599	210.9	234.6	0.472
130	2.271	220.0	245.2	0.463	1.671	218.8	243.6	0.487
150	2.361	228.0	254.2	0.478	1.741	227.0	252.8	0.503
170	2.450	236.3	263.5	0.493	1.810	235.4	262.2	0.518
190	2.539	244.8	273.0	0.508	1.879	244.0	271.8	0.533
210	2.626	253.5	282.7	0.523	1.946	252.7	281.5	0.548
230	2.713	262.3	292.5	0.537	2.013	261.7	291.5	0.562
250	2.800	271.6	302.7	0.552	2.079	270.9	301.7	0.577
	$P = 100$ psia ($T_{\text{sat}} = 55.1$ °F)				$P = 120$ psia ($T_{\text{sat}} = 67.2$ °F)			
Sat	1.073	188.1	207.9	0.414	0.895	191.1	210.9	0.412
80	1.156	197.8	219.2	0.435	0.932	196.2	216.9	0.424
100	1.219	205.7	228.3	0.452	0.989	204.3	226.3	0.441
120	1.280	213.7	237.4	0.468	1.043	212.5	235.7	0.457
140	1.340	221.9	246.7	0.483	1.094	220.8	245.1	0.473
160	1.398	230.2	256.1	0.499	1.145	229.2	254.7	0.489
180	1.454	238.8	265.7	0.514	1.194	237.9	264.4	0.504
200	1.510	247.5	275.5	0.529	1.242	246.7	274.3	0.520
220	1.566	256.4	285.4	0.544	1.289	255.6	284.3	0.534
240	1.620	265.6	295.6	0.559	1.336	264.8	294.5	0.549
260	1.674	274.9	305.9	0.573	1.382	274.2	304.9	0.564
280	1.728	284.4	316.4	0.588	1.427	283.8	315.5	0.579
	$P = 140$ psia ($T_{\text{sat}} = 78.0$ °F)				$P = 160$ psia ($T_{\text{sat}} = 87.6$ °F)			
Sat	0.765	193.7	213.5	0.412	0.667	196.0	215.7	0.411
100	0.823	222.9	224.2	0.431	0.697	201.2	221.9	0.422
120	0.872	232.4	233.8	0.448	0.743	209.9	231.9	0.439
140	0.919	242.1	243.5	0.464	0.786	218.4	241.7	0.456
160	0.964	251.7	253.2	0.480	0.827	227.2	251.7	0.472
180	1.007	261.4	263.0	0.496	0.867	235.9	261.6	0.488
200	1.050	271.4	273.0	0.511	0.905	244.9	271.7	0.504
220	1.091	281.5	283.2	0.526	0.943	254.0	282.0	0.519
240	1.132	291.7	293.5	0.541	0.980	263.4	292.4	0.534
260	1.173	302.1	303.9	0.556	1.016	272.8	302.9	0.549
280	1.213	312.7	314.6	0.571	1.051	282.6	313.7	0.564
300	1.252	323.6	325.5	0.585	1.087	292.4	324.6	0.578

Appendix F

Steam Tables

See Tables F.1, F.2, F.3 and F.4.

Table F.1 Saturated steam table in english units

T °F	P^{sat} psia	Spec. vol. V ft ³ /lbm		U Btu/lb		Enthalpy H Btu/lb		Entropy S Btu/lb R	
		V_l	V_g	U_l	U_g	H_l	H_g	S_l	S_g
32	0.0886	0.01602	3304.6	-0.02	1021.3	-0.02	1075.5	0.0000	2.1873
34	0.0960	0.01602	3061.9	2.00	1022.0	2.00	1076.4	0.0041	2.1802
36	0.1040	0.01602	2839.0	4.01	1022.6	4.01	1077.2	0.0081	2.1732
38	0.1125	0.01602	2634.2	6.02	1023.3	6.02	1078.1	0.0122	2.1663
40	0.1216	0.01602	2445.8	8.03	1023.9	8.03	1079.0	0.0162	2.1594
42	0.1314	0.01602	2272.4	10.03	1024.6	10.03	1079.9	0.0202	2.1527
44	0.1419	0.01602	2112.8	12.04	1025.2	12.04	1080.7	0.0242	2.1459
46	0.1531	0.01602	1965.7	14.05	1025.9	14.05	1081.6	0.0282	2.1393
48	0.1651	0.01602	1830.0	16.05	1026.6	16.05	1082.5	0.0321	2.1327
50	0.1780	0.01602	1704.8	18.05	1027.2	18.05	1083.4	0.0361	2.1262
52	0.1916	0.01602	1589.2	20.06	1027.9	20.06	1084.2	0.0400	2.1197
54	0.2063	0.01603	1482.4	22.06	1028.5	22.06	1085.1	0.0439	2.1134
56	0.2218	0.01603	1383.6	24.06	1029.2	24.06	1086.0	0.0478	2.1070
58	0.2384	0.01603	1292.2	26.06	1029.8	26.06	1086.9	0.0516	2.1008
60	0.2561	0.01603	1207.6	28.06	1030.5	28.06	1087.7	0.0555	2.0946
62	0.2749	0.01604	1129.2	30.06	1031.2	30.06	1088.6	0.0593	2.0885
64	0.2950	0.01604	1056.5	32.06	1031.8	32.06	1089.5	0.0632	2.0824
66	0.3163	0.01604	989.1	34.06	1032.5	34.06	1090.4	0.0670	2.0764
68	0.3389	0.01605	926.5	36.05	1033.1	36.05	1091.2	0.0708	2.0704
70	0.3629	0.01605	868.4	38.05	1033.8	38.05	1092.1	0.0745	2.0645
72	0.3884	0.01605	814.3	40.05	1034.4	40.05	1093.0	0.0783	2.0587
74	0.4155	0.01606	764.1	42.05	1035.1	42.05	1093.8	0.0821	2.0529
76	0.4442	0.01606	717.4	44.04	1035.7	44.04	1094.7	0.0858	2.0472
78	0.4746	0.01607	673.9	46.04	1036.4	46.04	1095.6	0.0895	2.0415

(continued)

Table F.1 (continued)

T °F	P ^{sat} psia	Spec. vol. V ft ³ /lbm		U Btu/lb		Enthalpy H Btu/lb		Entropy S Btu/lb R	
		V _l	V _g	U _l	U _g	H _l	H _g	S _l	S _g
80	0.5068	0.01607	633.3	48.03	1037.0	48.04	1096.4	0.0932	2.0359
82	0.5409	0.01608	595.6	50.03	1037.7	50.03	1097.3	0.0969	2.0303
84	0.5770	0.01608	560.3	52.03	1038.3	52.03	1098.2	0.1006	2.0248
86	0.6152	0.01609	527.5	54.02	1039.0	54.03	1099.0	0.1043	2.0193
88	0.6555	0.01609	496.8	56.02	1039.6	56.02	1099.9	0.1079	2.0139
90	0.6981	0.01610	468.1	58.02	1040.3	58.02	1100.8	0.1115	2.0086
92	0.7431	0.01610	441.3	60.01	1040.9	60.01	1101.6	0.1152	2.0033
94	0.7906	0.01611	416.3	62.01	1041.6	62.01	1102.5	0.1188	1.9980
96	0.8407	0.01612	392.9	64.00	1042.2	64.01	1103.3	0.1224	1.9928
98	0.8936	0.01612	370.9	66.00	1042.9	66.00	1104.2	0.1260	1.9876
100	0.9492	0.01613	350.4	68.00	1043.5	68.00	1105.1	0.1295	1.9825
102	1.0079	0.01614	331.1	69.99	1044.2	70.00	1105.9	0.1331	1.9775
104	1.0697	0.01614	313.1	71.99	1044.8	71.99	1106.8	0.1366	1.9725
106	1.1347	0.01615	296.2	73.98	1045.4	73.99	1107.6	0.1402	1.9675
108	1.2030	0.01616	280.3	75.98	1046.1	75.98	1108.5	0.1437	1.9626
110	1.2750	0.01617	265.4	77.98	1046.7	77.98	1109.3	0.1472	1.9577
112	1.3510	0.01617	251.4	79.97	1047.4	79.98	1110.2	0.1507	1.9528
114	1.4300	0.01618	238.2	81.97	1048.0	81.97	1111.0	0.1542	1.9480
116	1.5130	0.01619	225.9	83.97	1048.6	83.97	1111.9	0.1577	1.9433
118	1.6010	0.01620	214.2	85.96	1049.3	85.97	1112.7	0.1611	1.9386
120	1.6930	0.01620	203.3	87.96	1049.9	87.97	1113.6	0.1646	1.9339
122	1.7890	0.01621	193.0	89.96	1050.6	89.96	1114.4	0.1680	1.9293
124	1.8900	0.01622	183.2	91.96	1051.2	91.96	1115.3	0.1715	1.9247
126	1.9960	0.01623	174.1	93.95	1051.8	93.96	1116.1	0.1749	1.9202
128	2.1070	0.01624	165.5	95.95	1052.4	95.96	1117.0	0.1783	1.9157
130	2.2230	0.01625	157.3	97.95	1053.1	97.96	1117.8	0.1817	1.9112
132	2.345	0.01626	149.66	99.95	1053.7	99.95	1118.6	0.1851	1.9068
134	2.472	0.01626	142.41	101.94	1054.3	101.95	1119.5	0.1884	1.9024
136	2.605	0.01627	135.57	103.94	1055.0	103.95	1120.3	0.1918	1.8980
138	2.744	0.01628	129.11	105.94	1055.6	105.95	1121.1	0.1951	1.8937
140	2.889	0.01629	123.00	107.94	1056.2	107.95	1122.0	0.1985	1.8895
142	3.041	0.01630	117.22	109.94	1056.8	109.95	1122.8	0.2018	1.8852
144	3.200	0.01631	111.76	111.94	1057.5	111.95	1123.6	0.2051	1.8810
146	3.365	0.01632	106.59	113.94	1058.1	113.95	1124.5	0.2084	1.8769
148	3.538	0.01633	101.70	115.94	1058.7	115.95	1125.3	0.2117	1.8727
150	3.718	0.01634	97.07	117.94	1059.3	117.95	1126.1	0.2150	1.8686
152	3.906	0.01635	92.68	119.94	1059.9	119.95	1126.9	0.2183	1.8646
154	4.102	0.01636	88.52	121.94	1060.5	121.95	1127.7	0.2216	1.8606

(continued)

Table F.1 (continued)

T °F	P ^{sat} psia	Spec. vol. V ft ³ /lbm		U Btu/lb		Enthalpy H Btu/lb		Entropy S Btu/lb R	
		V _l	V _g	U _l	U _g	H _l	H _g	S _l	S _g
156	4.307	0.01637	84.57	123.94	1061.2	123.95	1128.6	0.2248	1.8566
158	4.520	0.01638	80.83	125.94	1061.8	125.96	1129.4	0.2281	1.8526
160	4.741	0.01640	77.29	127.94	1062.4	127.96	1130.2	0.2313	1.8487
162	4.972	0.01641	73.92	129.95	1063.0	129.96	1131.0	0.2345	1.8448
164	5.212	0.01642	70.72	131.95	1063.6	131.96	1131.8	0.2377	1.8409
166	5.462	0.01643	67.68	133.95	1064.2	133.97	1132.6	0.2409	1.8371
168	5.722	0.01644	64.80	135.95	1064.8	135.97	1133.4	0.2441	1.8333
170	5.993	0.01645	62.06	137.96	1065.4	137.97	1134.2	0.2473	1.8295
172	6.274	0.01646	59.45	139.96	1066.0	139.98	1135.0	0.2505	1.8258
174	6.566	0.01647	56.97	141.96	1066.6	141.98	1135.8	0.2537	1.8221
176	6.869	0.01649	54.61	143.97	1067.2	143.99	1136.6	0.2568	1.8184
178	7.184	0.01650	52.36	145.97	1067.8	145.99	1137.4	0.2600	1.8147
180	7.511	0.01651	50.22	147.98	1068.4	148.00	1138.2	0.2631	1.8111
182	7.850	0.01652	48.19	149.98	1069.0	150.01	1139.0	0.2662	1.8075
184	8.203	0.01653	46.25	151.99	1069.6	152.01	1139.8	0.2694	1.8040
186	8.568	0.01655	44.40	153.99	1070.2	154.02	1140.5	0.2725	1.8004
188	8.947	0.01656	42.64	156.00	1070.7	156.03	1141.3	0.2756	1.7969
190	9.340	0.01657	40.96	158.01	1071.3	158.04	1142.1	0.2787	1.7934
192	9.747	0.01658	39.35	160.02	1071.9	160.05	1142.9	0.2818	1.7900
194	10.168	0.01660	37.82	162.02	1072.5	162.05	1143.7	0.2848	1.7865
196	10.605	0.01661	36.36	164.03	1073.1	164.06	1144.4	0.2879	1.7831
198	11.058	0.01662	34.97	166.04	1073.6	166.08	1145.2	0.2910	1.7798
200	11.526	0.01664	33.64	168.05	1074.2	168.09	1146.0	0.2940	1.7764
202	12.011	0.01665	32.37	170.06	1074.8	170.10	1146.7	0.2971	1.7731
204	12.512	0.01666	31.15	172.07	1075.3	172.11	1147.5	0.3001	1.7698
206	13.031	0.01668	29.99	174.08	1075.9	174.12	1148.2	0.3031	1.7665
208	13.568	0.01669	28.88	176.09	1076.5	176.14	1149.0	0.3061	1.7632
210	14.123	0.01670	27.82	178.11	1077.0	178.15	1149.7	0.3091	1.7600
212	14.696	0.01672	26.80	180.12	1077.6	180.17	1150.5	0.3121	1.7568
215	15.592	0.01674	25.36	183.14	1078.4	183.19	1151.6	0.3166	1.7520
220	17.186	0.01678	23.15	188.18	1079.8	188.23	1153.4	0.3241	1.7442
225	18.912	0.01681	21.17	193.22	1081.2	193.28	1155.3	0.3315	1.7365
230	20.780	0.01685	19.38	196.27	1082.5	198.33	1157.1	0.3388	1.7290
235	22.790	0.01689	17.77	203.32	1083.9	203.39	1158.8	0.3461	1.7215
240	24.970	0.01693	16.32	208.37	1085.2	208.45	1160.6	0.3533	1.7142
245	27.310	0.01697	15.01	213.43	1086.5	213.52	1162.3	0.3606	1.7070
250	29.820	0.01701	13.82	218.50	1087.8	218.59	1164.0	0.3677	1.7000

Table F.2 Superheated steam tables in english units

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
$P = 1$ psia, $T^{\text{sat}} = 101.74$ °F												
Sat liq.	0.016	69.7	69.7	0.1326	0.016	130.2	130.2	0.2349				
Sat vap	333.6	1044.1	1105.8	1.9781	73.53	1063.1	1131.1	1.8443				
200	392.5	1077.5	1150.2	2.0509	78.14	1076.3	1148.6	1.8716				
250	422.4	1094.7	1172.9	2.0841	84.21	1093.8	1171.7	1.9054				
300	452.3	1112.0	1195.7	2.1152	90.24	1111.3	1194.8	1.9369				
350	452.3	1129.5	1218.7	2.1445	96.25	1128.9	1218.0	1.9664				
400	511.9	1147.1	1241.8	2.1722	102.20	1146.7	1241.3	1.9943				
450	541.7	1164.9	1265.1	2.1985	108.20	1164.5	1264.7	2.0208				
500	571.5	1182.8	1288.6	2.2237	114.20	1182.6	1288.2	2.0460				
600	631.1	1219.3	1336.1	2.2708	126.10	1219.2	1335.9	2.0932				
700	690.7	1256.7	1384.5	2.3144	138.10	1256.5	1384.3	2.1369				
800	750.3	1294.9	1433.7	2.3551	150.00	1294.8	1433.6	2.1776				
900	809.9	1334.0	1483.8	2.3934	161.90	1333.9	1483.7	2.2159				
1000	869.5	1374.0	1534.9	2.4296	173.90	1373.9	1534.7	2.2521				
1100	929.0	1414.9	1586.8	2.4640	185.80	1414.8	1586.7	2.2866				
1200	988.6	1456.7	1639.7	2.4969	197.70	1456.7	1639.6	2.3194				
$P = 10$ psia, $T^{\text{sat}} = 193.21$ °F												
Sat liq.	0.017	161.2	161.3	0.2836	0.017	180.1	180.2	0.3121				
Sat vap	38.42	1072.3	1143.3	1.7879	26.80	1077.6	1150.5	1.7568				
200	38.84	1074.7	1146.6	1.7928	.....	.....	.....	.....
250	41.93	1092.6	1170.2	1.8273	28.42	1091.5	1168.8	1.7833				
300	44.98	1110.4	1193.7	1.8593	30.52	1109.6	1192.6	1.8158				
350	48.02	1128.3	1217.1	1.8892	32.60	1127.6	1216.3	1.8460				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
400	51.03	1146.1	1240.6	1.9173	34.67	1145.7	1239.9	1.8743				
450	54.04	1164.1	1264.1	1.9439	36.72	1163.7	1263.6	1.9010				
500	57.04	1182.2	1287.8	1.9692	38.77	1181.9	1287.4	1.9265				
600	63.03	1218.9	1335.5	2.0166	42.86	1218.7	1335.2	1.9739				
700	69.00	1256.4	1384.0	2.0603	46.93	1256.2	1383.8	2.0177				
800	74.98	1294.6	1433.4	2.1011	51.00	1294.5	1433.2	2.0585				
900	80.94	1333.7	1483.5	2.1394	55.06	1333.6	1483.4	2.0969				
1000	86.91	1373.8	1534.6	2.1757	59.13	1373.7	1534.5	2.1331				
1100	92.87	1414.7	1586.6	2.2101	63.19	1414.6	1586.5	2.1676				
1200	98.84	1456.6	1639.5	2.2430	67.25	1456.5	1639.4	2.2005				
	$P = 15$ psia, $T^{\text{sat}} = 213.03^\circ\text{F}$											
Sat liq.	0.017	181.2	181.2	0.3137	0.017	196.2	196.3	0.3358				
Sat vap	26.29	1077.9	1150.9	1.7552	20.09	1082.0	1156.3	1.7320				
250	27.84	1091.4	1168.7	1.7809	20.79	1090.2	1167.1	1.7475				
300	29.90	1109.5	1192.5	1.8134	22.36	1108.6	1191.4	1.7805				
350	31.94	1127.6	1216.2	1.8436	23.90	1126.9	1215.4	1.8111				
400	33.96	1145.6	1239.9	1.8720	25.43	1145.1	1239.2	1.8397				
450	35.98	1163.7	1263.6	1.8988	26.95	1163.3	1263.0	1.8666				
500	37.98	1181.9	1287.3	1.9242	28.46	1181.6	1286.9	1.8921				
600	41.99	1218.7	1335.2	1.9717	31.47	1218.4	1334.9	1.9397				
700	45.98	1256.2	1383.8	2.0155	34.46	1256.0	1383.5	1.9836				
800	49.96	1294.5	1433.2	2.0563	37.46	1294.3	1432.9	2.0244				
900	53.95	1333.6	1483.4	2.0946	40.45	1333.5	1483.2	2.0628				
1000	57.93	1373.7	1534.5	2.1309	43.43	1373.6	1534.3	2.0991				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
1100	61.90	1414.6	1586.5	2.1653	46.42	1414.5	1586.3	2.1336	49.40	1456.4	1639.3	2.1665
1200	65.88	1456.5	1639.4	2.1982	$P = 30$ psia, $T^{\text{sat}} = 250.34$ °F							
Sat liq.	0.017	208.4	208.5	0.3535	0.017	218.8	218.9	0.3692				
Sat vap	16.30	1085.2	1160.6	1.7141	13.74	1087.9	1164.1	1.6995				
250	16.56	1089.0	1165.6	1.7212	.....	.....	.....	.....
300	17.83	1107.7	1190.2	1.7547	14.81	1106.8	1189.0	1.7334				
350	19.08	1126.2	1214.5	1.7856	15.86	1125.5	1213.6	1.7647				
400	20.31	1144.6	1238.5	1.8145	16.89	1144.0	1237.8	1.7937				
450	21.53	1162.9	1262.5	1.8415	17.91	1162.5	1261.9	1.8210				
500	22.74	1181.2	1286.4	1.8672	18.93	1180.9	1286.0	1.8467				
600	25.15	1218.2	1334.6	1.9149	20.95	1218.0	1334.2	1.8946				
700	27.56	1255.8	1383.3	1.9588	22.95	1255.6	1383.0	1.9386				
800	29.95	1294.2	1432.7	1.9997	24.95	1294.0	1432.5	1.9795				
900	32.35	1333.4	1483.0	2.0381	26.95	1333.2	1482.8	2.0179				
1000	34.74	1373.5	1534.2	2.0744	28.94	1373.3	1534.0	2.0543				
1100	37.13	1414.4	1586.2	2.1089	30.94	1414.3	1586.1	2.0888				
1200	39.52	1456.3	1639.2	2.1418	32.93	1456.3	1639.0	2.1217				
$P = 35$ psia, $T^{\text{sat}} = 259.29$ °F												
Sat liq.	0.017	227.9	228.0	0.3809	0.017	236.0	236.1	0.3921				
Sat vap	11.90	1090.1	1167.1	1.6872	10.50	1092.1	1169.8	1.6765				
300	12.65	1105.9	1187.8	1.7152	11.04	1104.9	1186.6	1.6992				
350	13.56	1124.8	1212.7	1.7468	11.84	1124.1	1211.7	1.7312				
400	14.45	1143.5	1237.1	1.7761	12.62	1142.9	1236.4	1.7608				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
450	15.33	1162.0	1261.3	1.8035	13.40	1161.6	1260.8	1.7883				
500	16.21	1180.5	1285.5	1.8294	14.16	1180.2	1285.0	1.8143				
600	17.94	1217.7	1333.9	1.8774	15.68	1217.5	1333.6	1.8624				
700	19.66	1255.4	1382.8	1.9214	17.19	1255.3	1382.5	1.9065				
800	21.38	1293.9	1432.3	1.9624	18.70	1293.7	1432.1	1.9476				
900	23.09	1333.1	1482.7	2.0009	20.20	1333.0	1482.5	1.9860				
1000	24.80	1373.2	1533.9	2.0372	21.70	1373.1	1533.7	2.0224				
1100	26.51	1414.3	1586.0	2.0717	23.19	1414.2	1585.8	2.0569				
1200	28.22	1456.2	1638.9	2.1046	24.69	1456.1	1638.8	2.0899				
$P = 45$ psia, $T^{\text{sat}} = 274.44$ °F												
Sat liq.	0.017	243.3	243.5	0.4021	0.017	250.1	250.2	0.4112				
Sat vap	9.40	1093.8	1172.0	1.6671	8.51	1095.3	1174.1	1.6586				
300	9.78	1104.0	1185.4	1.6849	8.77	1103.0	1184.1	1.6720				
350	10.50	1123.4	1210.8	1.7173	9.42	1122.7	1209.9	1.7048				
400	11.20	1142.4	1235.7	1.7471	10.06	1141.8	1234.9	1.7349				
450	11.89	1161.2	1260.2	1.7749	10.69	1160.7	1259.6	1.7628				
500	12.58	1179.8	1284.6	1.8009	11.31	1179.5	1284.1	1.7890				
600	13.93	1217.2	1333.3	1.8492	12.53	1217.0	1332.9	1.8374				
700	15.28	1255.1	1382.3	1.8934	13.74	1254.9	1382.0	1.8816				
800	16.61	1293.6	1431.9	1.9345	14.95	1293.4	1431.7	1.9227				
900	17.95	1332.9	1482.3	1.9730	16.15	1332.7	1482.2	1.9613				
1000	19.28	1373.0	1533.6	2.0093	17.35	1372.9	1533.4	1.9977				
1100	20.61	1414.1	1585.7	2.0439	18.55	1414.0	1585.6	2.0322				
1200	21.94	1456.0	1638.7	2.0768	19.75	1455.9	1638.6	2.0652				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	U Btu/lb	H Btu/lb	S Btu/lb R
$P = 55$ psia, $T^{\text{sat}} = 287.08$ °F											
Sat liq.					0.017	262.0	262.2		0.017	262.0	262.2
Sat vap	7.79	1096.7	1175.9	1.6510	7.174	1098.0	1177.6	1.6440	7.174	1098.0	1177.6
300	7.95	1102.0	1182.8	1.6601	7.257	1101.0	1181.6	1.6492	7.257	1101.0	1181.6
350	8.55	1121.9	1208.9	1.6934	7.815	1121.2	1208.0	1.6829	7.815	1121.2	1208.0
400	9.13	1141.3	1234.2	1.7237	8.354	1140.7	1233.5	1.7134	8.354	1140.7	1233.5
450	9.70	1160.3	1259.1	1.7518	8.881	1159.9	1258.5	1.7417	8.881	1159.9	1258.5
500	10.27	1179.1	1283.6	1.7781	9.400	1178.8	1283.2	1.7681	9.400	1178.8	1283.2
600	11.38	1216.8	1332.6	1.8266	10.420	1216.5	1332.3	1.8168	10.420	1216.5	1332.3
700	12.48	1254.7	1381.8	1.8710	11.440	1254.5	1381.5	1.8612	11.440	1254.5	1381.5
800	13.58	1293.3	1431.5	1.9121	12.450	1293.1	1431.3	1.9024	12.450	1293.1	1431.3
900	14.68	1332.6	1482.0	1.9507	13.450	1332.5	1481.8	1.9410	13.450	1332.5	1481.8
1000	15.77	1372.8	1533.3	1.9871	14.450	1372.7	1533.2	1.9774	14.450	1372.7	1533.2
1100	16.86	1413.9	1585.5	2.0216	15.450	1413.8	1585.3	2.0120	15.450	1413.8	1585.3
1200	17.95	1455.8	1638.5	2.0546	16.450	1455.8	1638.4	2.0450	16.450	1455.8	1638.4
$P = 65$ psia, $T^{\text{sat}} = 297.98$ °F											
Sat liq.	0.02	267.4	267.6	0.4344	0.018	272.5	272.7		0.018	272.5	272.7
Sat vap	6.65	1099.1	1179.1	1.6375	6.205	1100.2	1180.6	1.6316	6.205	1100.2	1180.6
300	6.68	1100.0	1180.3	1.6390	.....	.....	.....	.....	.....	.....	.....
350	7.20	1120.4	1207.0	1.6731	6.664	1119.7	1206.0	1.6640	6.664	1119.7	1206.0
400	7.70	1140.2	1232.7	1.7040	7.133	1139.6	1232.0	1.6951	7.133	1139.6	1232.0
450	8.19	1159.4	1257.9	1.7324	7.590	1159.0	1257.3	1.7237	7.590	1159.0	1257.3
500	8.67	1178.4	1282.7	1.7589	8.039	1178.1	1282.2	1.7504	8.039	1178.1	1282.2
600	9.62	1216.3	1331.9	1.8077	8.922	1216.0	1331.6	1.7993	8.922	1216.0	1331.6

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
700	10.55	1254.3	1381.3	1.8522	9.793	1254.1	1381.0	1.8439				
800	11.48	1293.0	1431.1	1.8935	10.660	1292.8	1430.9	1.8852				
900	12.41	1332.4	1481.6	1.9321	11.520	1332.2	1481.5	1.9238				
1000	13.34	1372.6	1533.0	1.9685	12.380	1372.5	1532.9	1.9603				
1100	14.26	1413.7	1585.2	2.0031	13.240	1413.6	1585.1	1.9949				
1200	15.18	1455.7	1638.3	2.0361	14.100	1455.6	1638.2	2.0279				
$P = 75$ psia, $T^{\text{sat}} = 307.61$ °F												
Sat liq.	0.02	277.3	277.6	0.4474								
Sat vap	5.81	1101.2	1181.9	1.6260								
350	6.20	1118.9	1205.0	1.6554								
400	6.65	1139.0	1231.2	1.6868								
450	7.08	1158.5	1256.7	1.7156								
500	7.49	1177.7	1281.7	1.7424								
600	8.32	1215.8	1331.3	1.7915								
700	9.14	1254.0	1380.7	1.8361								
800	9.95	1292.7	1430.7	1.8774								
900	10.75	1332.1	1481.3	1.9161								
1000	11.55	1372.4	1532.7	1.9526								
1100	12.35	1413.5	1585.0	1.9872								
1200	13.15	1455.5	1638.1	2.0202								
$P = 80$ psia, $T^{\text{sat}} = 312.04$												
Sat liq.	0.018	281.9	282.2	0.4534	0.018	286.2	286.5	0.4590				
Sat vap	5.471	1102.1	1183.1	1.6208	5.167	1102.9	1184.2	1.6159				
340	5.715	1114.0	1198.6	1.6405	5.364	1113.1	1197.5	1.6328				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
360	5.885	1122.3	1209.4	1.6539	5.525	1121.5	1208.4	1.6463				
380	6.053	1130.4	1220.0	1.6667	5.684	1129.7	1219.1	1.6592				
400	6.218	1138.4	1230.5	1.6790	5.840	1137.8	1229.7	1.6716				
420	6.381	1146.3	1240.8	1.6909	5.995	1145.8	1240.1	1.6836				
450	6.622	1158.1	1256.1	1.7080	6.223	1157.6	1255.5	1.7008				
500	7.018	1177.4	1281.3	1.7349	6.597	1177.0	1280.8	1.7279				
600	7.794	1215.5	1330.9	1.7842	7.330	1215.3	1330.6	1.7772				
700	8.560	1253.8	1380.5	1.8289	8.052	1253.6	1380.2	1.8220				
800	9.319	1292.5	1430.5	1.8702	8.768	1292.4	1430.3	1.8634				
900	10.080	1332.0	1481.1	1.9089	9.480	1331.9	1481.0	1.9021				
1000	10.830	1372.3	1532.6	1.9454	10.190	1372.2	1532.4	1.9386				
1100	11.580	1413.4	1584.9	1.9800	10.900	1413.3	1584.7	1.9733				
1200	12.330	1455.4	1638.0	2.0131	11.600	1455.4	1637.9	2.0630				
	$P = 90$ psia, $T^{\text{sat}} = 320.28$ °F											
Sat liq.	0.018	290.4	290.7	0.4643	0.018	294.4	294.7	0.4694				
Sat vap	4.895	1103.7	1185.3	1.6113	4.651	1104.5	1186.2	1.6069				
340	5.051	1112.3	1196.4	1.6254	4.771	1111.4	1195.3	1.6184				
360	5.205	1120.8	1207.5	1.6391	4.919	1120.0	1206.5	1.6322				
380	5.356	1129.1	1218.3	1.6521	5.063	1128.4	1217.4	1.6453				
400	5.505	1137.2	1228.9	1.6646	5.205	1136.6	1228.1	1.6580				
420	5.652	1145.3	1239.4	1.6767	5.345	1144.7	1238.7	1.6701				
450	5.869	1157.2	1254.9	1.6940	5.551	1156.7	1254.3	1.6876				
500	6.223	1176.7	1280.3	1.7212	5.889	1176.3	1279.8	1.7149				
600	6.917	1215.0	1330.2	1.7707	6.548	1214.8	1329.9	1.7645				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
700	7.600	1253.4	1380.0	1.8156	7.196	1253.2	1379.7	1.8094				
800	8.277	1292.2	1430.1	1.8570	7.838	1292.1	1429.9	1.8509				
900	8.950	1331.7	1480.8	1.8957	8.477	1331.6	1480.6	1.8897				
1000	9.621	1372.0	1532.3	1.9323	9.113	1371.9	1532.1	1.9262				
1100	10.290	1413.2	1584.6	1.9669	9.747	1413.1	1584.5	1.9609				
1200	10.960	1455.3	1637.8	2.0000	10.380	1455.2	1637.7	1.9940				
$P = 100$ psia, $T^{\text{sat}} = 327.82$ °F												
Sat liq.	0.018	298.2	298.5	0.4743	0.018	301.9	302.2	0.4790				
Sat vap	4.431	1105.2	1187.2	1.6027	4.231	1105.8	1188.0	1.5988				
340	4.519	1110.6	1194.2	1.6116	4.291	1109.7	1193.1	1.6051				
360	4.660	1119.2	1205.5	1.6255	4.427	1118.5	1204.5	1.6192				
380	4.799	1127.7	1216.5	1.6389	4.560	1127.0	1215.6	1.6326				
400	4.935	1136.0	1227.4	1.6516	4.690	1135.4	1226.6	1.6455				
420	5.068	1144.2	1238.0	1.6638	4.818	1143.7	1237.3	1.6578				
450	5.266	1156.3	1253.7	1.6814	5.007	1155.8	1253.1	1.6755				
500	5.588	1175.9	1279.3	1.7088	5.315	1175.6	1278.8	1.7031				
600	6.216	1214.5	1329.6	1.7586	5.915	1214.3	1329.2	1.7530				
700	6.833	1253.0	1379.5	1.8036	6.504	1252.8	1379.2	1.7981				
800	7.443	1291.9	1429.7	1.8451	7.086	1291.8	1429.4	1.8396				
900	8.050	1331.5	1480.4	1.8839	7.665	1331.3	1480.3	1.8785				
1000	8.655	1371.8	1532.0	1.9205	8.241	1371.7	1531.8	1.9151				
1100	9.258	1413.0	1584.4	1.9552	8.816	1412.9	1584.2	1.9498				
1200	9.860	1455.1	1637.6	1.9883	9.389	1455.0	1637.5	1.9828				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
$P = 110$ psia, $T^{\text{sat}} = 334.79$ °F												
Sat liq.	0.018	305.4	305.8	0.4834	0.018	308.9	309.3	0.4877				
Sat vap	4.048	1106.5	1188.9	1.5950	3.881	1107.0	1189.6	1.5913				
340	4.083	1108.8	1191.9	1.5988	3.894	1107.9	1190.8	1.5928				
360	4.214	1117.7	1203.5	1.6131	4.020	1116.9	1202.5	1.6072				
380	4.343	1126.4	1214.7	1.6267	4.144	1125.7	1213.8	1.6209				
400	4.468	1134.8	1225.8	1.6396	4.265	1134.2	1225.0	1.6340				
420	4.591	1143.1	1236.6	1.6521	4.383	1142.6	1235.8	1.6465				
450	4.772	1155.3	1252.5	1.6698	4.558	1154.8	1251.8	1.6644				
500	5.068	1175.2	1278.3	1.6975	4.841	1174.8	1277.9	1.6922				
600	5.642	1214.0	1328.9	1.7476	5.392	1213.8	1328.6	1.7425				
700	6.205	1252.7	1378.9	1.7928	5.932	1252.5	1378.7	1.7877				
800	6.761	1291.6	1429.2	1.8344	6.465	1291.5	1429.0	1.8294				
900	7.314	1331.2	1480.1	1.8732	6.994	1331.1	1479.9	1.8682				
1000	7.865	1371.6	1531.7	1.9099	7.521	1371.5	1531.6	1.9049				
1100	8.413	1412.8	1584.1	1.9446	8.046	1412.8	1584.0	1.9396				
1200	8.961	1455.0	1637.4	1.9777	8.570	1454.9	1637.2	1.9727				
$P = 120$ psia, $T^{\text{sat}} = 341.27$ °F												
Sat liq.	0.018	312.2	312.6	0.4919	0.018	315.4	315.8	0.4959				
Sat vap	3.728	1107.6	1190.4	1.5879	3.586	1108.1	1191.1	1.5845				
360	3.842	1116.1	1201.4	1.6015	3.679	1115.3	1200.4	1.5960				
380	3.962	1124.9	1212.9	1.6154	3.794	1124.2	1212.0	1.6100				
400	4.079	1133.6	1224.1	1.6286	3.907	1132.9	1223.3	1.6233				
420	4.193	1142.0	1235.1	1.6412	4.018	1141.4	1234.4	1.6360				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
450	4.361	1154.4	1251.2	1.6592	4.180	1153.9	1250.6	1.6541	4.180	1153.9	1250.6	1.6541
500	4.634	1174.5	1277.4	1.6872	4.443	1174.1	1276.9	1.6823	4.443	1174.1	1276.9	1.6823
600	5.164	1213.5	1328.2	1.7376	4.953	1213.3	1327.9	1.7328	4.953	1213.3	1327.9	1.7328
700	5.681	1252.3	1378.4	1.7829	5.451	1252.1	1378.2	1.7782	5.451	1252.1	1378.2	1.7782
800	6.193	1291.3	1428.8	1.8246	5.943	1291.2	1428.6	1.8199	5.943	1291.2	1428.6	1.8199
900	6.701	1331.0	1479.8	1.8635	6.431	1330.8	1479.6	1.8589	6.431	1330.8	1479.6	1.8589
1000	7.206	1371.4	1531.4	1.9001	6.916	1371.3	1531.3	1.8955	6.916	1371.3	1531.3	1.8955
1100	7.710	1412.7	1583.9	1.9349	7.400	1412.6	1583.7	1.9303	7.400	1412.6	1583.7	1.9303
1200	8.212	1454.8	1637.1	1.9680	7.882	1454.7	1637.0	1.9634	7.882	1454.7	1637.0	1.9634
$P = 130$ psia, $T^{\text{sat}} = 347.33$ °F												
Sat liq.	0.018	318.5	319.0	0.4998	0.018	321.6	322.0	0.5035	0.018	321.6	322.0	0.5035
Sat vap	3.454	1108.6	1191.7	1.5813	3.332	1109.1	1192.4	1.5782	3.332	1109.1	1192.4	1.5782
360	3.527	1114.5	1199.4	1.5907	3.387	1113.7	1198.3	1.5855	3.387	1113.7	1198.3	1.5855
380	3.639	1123.5	1211.1	1.6048	3.496	1122.8	1210.1	1.5997	3.496	1122.8	1210.1	1.5997
400	3.749	1132.3	1222.5	1.6182	3.602	1131.7	1221.6	1.6133	3.602	1131.7	1221.6	1.6133
420	3.856	1140.9	1233.6	1.6310	3.706	1140.3	1232.9	1.6262	3.706	1140.3	1232.9	1.6262
450	4.013	1153.4	1249.9	1.6493	3.858	1152.9	1249.3	1.6446	3.858	1152.9	1249.3	1.6446
500	4.267	1173.7	1276.4	1.6775	4.104	1173.3	1275.8	1.6730	4.104	1173.3	1275.8	1.6730
600	4.759	1213.0	1327.5	1.7283	4.579	1212.8	1327.2	1.7239	4.579	1212.8	1327.2	1.7239
700	5.238	1251.9	1377.9	1.7737	5.042	1251.7	1377.7	1.7694	5.042	1251.7	1377.7	1.7694
800	5.712	1291.0	1428.4	1.8155	5.498	1290.9	1428.2	1.8112	5.498	1290.9	1428.2	1.8112
900	6.181	1330.7	1479.4	1.8545	5.951	1330.6	1479.2	1.8502	5.951	1330.6	1479.2	1.8502
1000	6.649	1371.2	1531.1	1.8911	6.401	1371.1	1531.0	1.8869	6.401	1371.1	1531.0	1.8869
1100	7.114	1412.5	1583.6	1.9259	6.849	1412.4	1583.5	1.9217	6.849	1412.4	1583.5	1.9217
1200	7.578	1454.6	1636.9	1.9591	7.296	1454.5	1636.8	1.9548	7.296	1454.5	1636.8	1.9548

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
$P = 140$ psia, $T^{\text{sat}} = 353.04$ °F												
Sat liq.	0.018	324.5	325.0	0.5071	0.018	327.4	327.8	0.5107				
Sat vap	3.219	1109.6	1193.0	1.5752	3.113	1110.0	1193.5	1.5723				
360	3.257	1112.9	1197.2	1.5804	3.135	1112.0	1196.1	1.5755				
380	3.363	1122.1	1209.2	1.5948	3.239	1121.3	1208.2	1.5901				
400	3.466	1131.0	1220.8	1.6085	3.339	1130.4	1220.0	1.6039				
420	3.567	1139.7	1232.1	1.6215	3.437	1139.1	1231.4	1.6170				
450	3.714	1152.4	1248.7	1.6400	3.580	1151.9	1248.0	1.6356				
500	3.953	1172.9	1275.3	1.6686	3.812	1172.6	1274.8	1.6643				
600	4.412	1212.5	1326.8	1.7196	4.256	1212.3	1326.5	1.7155				
700	4.859	1251.5	1377.4	1.7652	4.689	1251.3	1377.1	1.7612				
800	5.299	1290.7	1428.0	1.8071	5.115	1290.6	1427.8	1.8031				
900	5.736	1330.5	1479.1	1.8461	5.537	1330.3	1478.9	1.8421				
1000	6.171	1371.0	1530.8	1.8828	5.957	1370.9	1530.7	1.8789				
1100	6.604	1412.3	1583.4	1.9176	6.375	1412.2	1583.2	1.9137				
1200	7.035	1454.5	1636.7	1.9508	6.791	1454.4	1636.6	1.9469				
$P = 155$ psia, $T^{\text{sat}} = 361.02$ °F												
Sat liq.	0.018	330.2	330.7	0.5141	0.018	332.9	333.4	0.5174				
Sat vap	3.014	1110.4	1194.1	1.5695	2.921	1110.8	1194.6	1.5668				
360	3.022	1111.2	1195.1	1.5707	.....	.....	.....	.....
380	3.123	1120.6	1207.3	1.5854	3.014	1119.8	1206.3	1.5809				
400	3.221	1129.7	1219.1	1.5993	3.110	1129.0	1218.2	1.5949				
420	3.316	1138.6	1230.6	1.6126	3.203	1138.0	1229.8	1.6083				
450	3.455	1151.4	1247.4	1.6313	3.339	1150.9	1246.7	1.6271				
500	3.680	1172.2	1274.3	1.6602	3.557	1171.8	1273.8	1.6561				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
600	4.111	1212.0	1326.1	1.7115	3.975	1211.8	1325.8	1.7077				
700	4.530	1251.1	1376.9	1.7573	4.381	1251.0	1376.6	1.7535				
800	4.942	1290.4	1427.6	1.7992	4.781	1290.3	1427.4	1.7955				
900	5.351	1330.2	1478.7	1.8383	5.177	1330.1	1478.6	1.8346				
1000	5.757	1370.7	1530.5	1.8751	5.570	1370.6	1530.4	1.8714				
1100	6.161	1412.1	1583.1	1.9099	5.961	1412.0	1583.0	1.9062				
1200	6.564	1454.3	1636.5	1.9431	6.352	1454.2	1636.4	1.9394				
$P = 160$ psia, $T^{\text{sat}} = 363.55$ °F												
Sat liq.	0.018	335.5	336.1	0.5206								
Sat vap	2.834	1111.2	1195.1	1.5641								
380	2.913	1119.1	1205.3	1.5764								
400	3.006	1128.4	1217.4	1.5906								
420	3.097	1137.4	1229.1	1.6041								
450	3.229	1150.4	1246.0	1.6231								
500	3.441	1171.4	1273.3	1.6522								
600	3.848	1211.5	1325.4	1.7039								
700	4.242	1250.8	1376.4	1.7499								
800	4.629	1290.1	1427.2	1.7919								
900	5.013	1330.0	1478.4	1.8310								
1000	5.395	1370.5	1530.3	1.8678								
1100	5.774	1411.9	1582.9	1.9027								
1200	6.152	1454.1	1636.3	1.9359								
$P = 165$ psia, $T^{\text{sat}} = 366.02$ °F												
Sat liq.	0.018	338.1	338.7	0.5238	0.018	340.7	341.2	0.5269				
Sat vap	2.751	1111.6	1195.6	1.5616	2.674	1111.9	1196.0	1.5591				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
400	2.908	1127.7	1216.5	1.5864	2.816	1127.0	1215.6	1.5823				
420	2.997	1136.8	1228.3	1.6000	2.903	1136.2	1227.5	1.5960				
440	3.083	1145.6	1239.7	1.6129	2.987	1145.1	1239.0	1.6090				
460	3.168	1154.2	1251.0	1.6252	3.070	1153.7	1250.3	1.6214				
480	3.251	1162.7	1261.9	1.6370	3.151	1162.3	1261.4	1.6333				
500	3.333	1171.0	1272.8	1.6484	3.231	1170.6	1272.2	1.6447				
550	3.533	1191.3	1299.2	1.6753	3.425	1191.0	1298.8	1.6717				
600	3.728	1211.3	1325.1	1.7003	3.616	1211.0	1324.7	1.6968				
700	4.111	1250.6	1376.1	1.7463	3.988	1250.4	1375.8	1.7428				
800	4.487	1289.9	1427.0	1.7884	4.354	1289.8	1426.8	1.7850				
900	4.860	1329.8	1478.2	1.8275	4.715	1329.7	1478.0	1.8241				
1000	5.230	1370.4	1530.1	1.8643	5.075	1370.3	1530.0	1.8610				
1100	5.598	1411.8	1582.7	1.8992	5.432	1411.7	1582.6	1.8959				
1200	5.965	1454.1	1636.2	1.9324	5.789	1454.0	1636.1	1.9291				
	$P = 175$ psia, $T^{\text{sat}} = 370.77$ °F											
Sat liq.	0.018	343.2	343.7	0.5299	0.018	345.6	346.2	0.5328	$P = 180$ psia, $T^{\text{sat}} = 373.08$ °F			
Sat vap	2.601	1112.2	1196.4	1.5567	2.531	1112.5	1196.9	1.5543				
400	2.729	1126.3	1214.7	1.5783	2.647	1125.6	1213.8	1.5743				
420	2.814	1135.6	1226.7	1.5921	2.730	1134.9	1225.9	1.5882				
440	2.897	1144.5	1238.3	1.6051	2.811	1144.0	1237.6	1.6014				
460	2.977	1153.3	1249.7	1.6176	2.890	1152.8	1249.0	1.6140				
480	3.056	1161.8	1260.8	1.6296	2.967	1161.4	1260.2	1.6260				
500	3.134	1170.2	1271.7	1.6411	3.043	1169.8	1271.2	1.6376				
550	3.224	1190.7	1298.4	1.6882	3.229	1190.4	1297.9	1.6647				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
600	3.510	1210.7	1324.4	1.6933	3.409	1210.5	1324.0	1.6900	3.409	1210.5	1324.0	1.6900
700	3.872	1250.2	1375.6	1.7395	3.762	1250.0	1375.3	1.7362	3.762	1250.0	1375.3	1.7362
800	4.227	1289.6	1426.5	1.7816	4.108	1289.5	1426.3	1.7784	4.108	1289.5	1426.3	1.7784
900	4.579	1329.6	1477.9	1.8208	4.451	1329.4	1477.7	1.8176	4.451	1329.4	1477.7	1.8176
1000	4.929	1370.2	1529.8	1.8577	4.791	1370.1	1529.7	1.8545	4.791	1370.1	1529.7	1.8545
1100	5.276	1411.6	1582.5	1.8926	5.129	1411.5	1582.4	1.8894	5.129	1411.5	1582.4	1.8894
1200	5.623	1453.9	1636.0	1.9258	5.466	1453.8	1635.9	1.9227	5.466	1453.8	1635.9	1.9227
$P = 185 \text{ psia}, T^{\text{sat}} = 375.33 \text{ }^\circ\text{F}$												
Sat liq.	0.018	348.0	348.6	0.5356	0.018	350.3	350.94	0.5384	$P = 190 \text{ psia}, T^{\text{sat}} = 377.53 \text{ }^\circ\text{F}$			
Sat vap	2.465	1112.8	1197.2	1.5520	2.403	1113.1	1197.6	1.5498	2.403	1113.1	1197.6	1.5498
400	2.570	1124.9	1212.9	1.5705	2.496	1124.2	1212.0	1.5667	2.496	1124.2	1212.0	1.5667
420	2.651	1134.3	1225.1	1.5845	2.576	1133.7	1224.3	1.5808	2.576	1133.7	1224.3	1.5808
440	2.730	1143.4	1236.9	1.5978	2.654	1142.9	1236.2	1.5942	2.654	1142.9	1236.2	1.5942
460	2.807	1152.3	1248.4	1.6104	2.729	1151.8	1247.7	1.6069	2.729	1151.8	1247.7	1.6069
480	2.883	1160.9	1259.6	1.6225	2.803	1160.5	1259.0	1.6191	2.803	1160.5	1259.0	1.6191
500	2.957	1169.4	1270.7	1.6341	2.876	1169.0	1270.1	1.6307	2.876	1169.0	1270.1	1.6307
550	3.138	1190.1	1297.5	1.6614	3.052	1189.8	1297.1	1.6581	3.052	1189.8	1297.1	1.6581
600	3.314	1210.2	1323.7	1.6867	3.225	1209.9	1323.3	1.6835	3.225	1209.9	1323.3	1.6835
700	3.658	1249.8	1375.1	1.7330	3.560	1249.6	1374.8	1.7299	3.560	1249.6	1374.8	1.7299
800	3.996	1289.3	1426.1	1.7753	3.889	1289.2	1425.9	1.7722	3.889	1289.2	1425.9	1.7722
900	4.329	1329.3	1477.5	1.8145	4.214	1329.2	1477.4	1.8115	4.214	1329.2	1477.4	1.8115
1000	4.660	1370.0	1529.5	1.8514	4.536	1369.9	1529.4	1.8484	4.536	1369.9	1529.4	1.8484
1100	4.989	1411.4	1582.3	1.8864	4.857	1411.3	1582.1	1.8834	4.857	1411.3	1582.1	1.8834
1200	5.317	1453.7	1635.8	1.9196	5.177	1453.7	1635.7	1.9166	5.177	1453.7	1635.7	1.9166

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
	$P = 195$ psia, $T^{\text{sat}} = 379.69$ °F				$P = 200$ psia, $T^{\text{sat}} = 381.80$ °F				$P = 210$ psia, $T^{\text{sat}} = 385.92$ °F			
Sat liq.	0.018	352.6	353.2	0.5412	0.018	354.8	355.5	0.5438	0.018	357.0	357.7	0.5465
Sat vap	2.344	1113.4	1198.0	1.5476	2.287	1113.7	1198.3	1.5454	2.182	1114.2	1199.0	1.5413
400	2.426	1123.5	1211.1	1.5630	2.360	1122.8	1210.1	1.5593	2.236	1121.3	1208.2	1.5522
420	2.505	1133.1	1223.4	1.5772	2.437	1132.4	1222.6	1.5737	2.311	1131.2	1221.0	1.5668
440	2.581	1142.3	1235.4	1.5907	2.511	1141.7	1234.7	1.5872	2.383	1140.6	1233.2	1.5806
460	2.655	1151.3	1247.1	1.6035	2.584	1150.8	1246.4	1.6001	2.453	1149.8	1245.1	1.5936
480	2.727	1160.0	1258.4	1.6157	2.655	1159.6	1257.9	1.6124				
500	2.798	1168.6	1269.6	1.6274	2.725	1168.2	1269.0	1.6242				
550	2.971	1189.4	1296.6	1.6549	2.894	1189.1	1296.2	1.6518				
600	3.139	1209.7	1323.0	1.6804	3.058	1209.4	1322.6	1.6773				
700	3.467	1249.4	1374.5	1.7269	3.378	1249.2	1374.3	1.7329				
800	3.788	1289.0	1425.7	1.7692	3.691	1288.9	1425.5	1.7663				
900	4.105	1329.1	1477.2	1.8085	4.001	1328.9	1477.0	1.8057				
1000	4.419	1369.8	1529.2	1.8455	4.308	1369.7	1529.1	1.8426				
1100	4.732	1411.3	1582.0	1.8804	4.613	1411.2	1581.9	1.8776				
1200	5.043	1453.6	1635.6	1.9137	4.916	1453.5	1635.4	1.9109				
	$P = 205$ psia, $T^{\text{sat}} = 383.88$ °F				$P = 210$ psia, $T^{\text{sat}} = 385.92$ °F				$P = 210$ psia, $T^{\text{sat}} = 385.92$ °F			
Sat liq.	0.018	357.0	357.7	0.5465	0.018	359.2	359.9	0.5490	0.018	359.2	359.9	0.5490
Sat vap	2.233	1113.9	1198.7	1.5434	2.182	1114.2	1199.0	1.5413	2.182	1114.2	1199.0	1.5413
400	2.297	1122.1	1209.2	1.5557	2.236	1121.3	1208.2	1.5522	2.236	1121.3	1208.2	1.5522
420	2.372	1131.8	1221.8	1.5702	2.311	1131.2	1221.0	1.5668	2.311	1131.2	1221.0	1.5668
440	2.446	1141.2	1234.0	1.5839	2.383	1140.6	1233.2	1.5806	2.383	1140.6	1233.2	1.5806
460	2.517	1150.3	1245.8	1.5969	2.453	1149.8	1245.1	1.5936	2.453	1149.8	1245.1	1.5936

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
480	2.587	1159.1	1257.3	1.6092	2.521	1158.7	1256.7	1.6061				
500	2.655	1167.8	1268.5	1.6211	2.588	1167.4	1268.0	1.6180				
550	2.820	1188.8	1295.8	1.6488	2.750	1188.5	1295.3	1.6458				
600	2.981	1209.2	1322.3	1.6744	2.908	1208.9	1321.9	1.6715				
700	3.294	1249.0	1374.0	1.7210	3.214	1248.8	1373.7	1.7182				
800	3.600	1288.7	1425.3	1.7635	3.513	1288.6	1425.1	1.7607				
900	3.902	1328.8	1476.8	1.8028	3.808	1328.7	1476.7	1.8001				
1000	4.202	1369.6	1528.9	1.8398	4.101	1369.4	1528.8	1.8371				
1100	4.499	1411.1	1581.8	1.8748	4.392	1411.0	1581.6	1.8721				
1200	4.796	1453.4	1635.3	1.9081	4.681	1453.3	1635.2	1.9054				
$P = 215$ psia, $T^{\text{sat}} = 387.91$ °F												
Sat liq.	0.019	361.3	362.1	0.5515	0.019	363.4	364.2	0.5540				
Sat vap	2.133	1114.4	1199.3	1.5393	2.086	1114.6	1199.6	1.5374				
400	2.179	1120.6	1207.3	1.5487	2.124	1119.9	1206.3	1.5453				
420	2.252	1130.5	1220.1	1.5634	2.196	1129.9	1219.3	1.5601				
440	2.323	1140.0	1232.5	1.5773	2.266	1139.5	1231.7	1.5741				
460	2.392	1149.3	1244.4	1.5905	2.333	1148.7	1243.7	1.5873				
480	2.459	1158.2	1256.0	1.6030	2.399	1157.8	1255.4	1.5999				
500	2.524	1167.0	1267.4	1.6149	2.464	1166.6	1266.9	1.6120				
550	2.684	1188.1	1294.9	1.6429	2.620	1187.8	1294.5	1.6400				
600	2.838	1208.6	1321.5	1.6686	2.771	1208.4	1321.2	1.6658				
700	3.137	1248.7	1373.5	1.7155	3.064	1248.5	1373.2	1.7128				
800	3.430	1288.4	1424.9	1.7580	3.350	1288.3	1424.7	1.7553				
900	3.718	1328.6	1476.5	1.7974	3.633	1328.4	1476.3	1.7948				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
1000	4.004	1369.3	1528.7	1.8344	3.912	1369.2	1528.5	1.8318				
1100	4.289	1410.9	1581.5	1.8694	4.190	1410.8	1581.4	1.8668				
1200	4.572	1453.2	1635.1	1.9028	4.467	1453.2	1635.0	1.9002				
$P = 225$ psia, $T^{\text{sat}} = 391.80$ °F												
Sat liq.	0.019	365.5	366.2	0.5564	0.019	367.5	368.3	0.5588				
Sat vap	2.041	1114.9	1199.9	1.5354	1.999	1115.1	1200.1	1.5336				
400	2.071	1119.1	1205.4	1.5419	2.021	1118.4	1204.4	1.5385				
420	2.143	1129.2	1218.4	1.5569	2.091	1128.5	1217.5	1.5537				
440	2.211	1138.9	1230.9	1.5710	2.159	1138.3	1230.2	1.5679				
460	2.278	1148.2	1243.1	1.5843	2.224	1147.7	1242.4	1.5813				
480	2.342	1157.3	1254.8	1.5969	2.288	1156.8	1254.2	1.5940				
500	2.406	1166.1	1266.3	1.6090	2.350	1165.7	1265.7	1.6062				
550	2.559	1187.5	1294.0	1.6372	2.501	1187.2	1293.6	1.6344				
600	2.707	1208.1	1320.8	1.6631	2.646	1207.8	1320.4	1.6604				
700	2.994	1248.3	1372.9	1.7101	2.928	1248.1	1372.7	1.7075				
800	3.275	1288.1	1424.5	1.7527	3.202	1288.0	1424.2	1.7502				
900	3.551	1328.3	1476.1	1.7922	3.473	1328.2	1476.0	1.7897				
1000	3.825	1369.1	1528.4	1.8293	3.741	1369.0	1528.2	1.8268				
1100	4.097	1410.7	1581.3	1.8643	4.007	1410.6	1581.1	1.8618				
1200	4.367	1453.1	1634.9	1.8977	4.272	1453.0	1634.8	1.8952				
$P = 235$ psia, $T^{\text{sat}} = 395.56$ °F												
Sat liq.	0.019	369.5	370.3	0.5611	0.019	371.5	372.3	0.5634				
Sat vap	1.957	1115.3	1200.4	1.5317	1.918	1115.5	1200.6	1.5299				
400	1.973	1117.6	1203.4	1.5353	1.927	1116.8	1202.4	1.5320				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
420	2.042	1127.9	1216.7	1.5505	1.995	1127.2	1215.8	1.5474				
440	2.109	1137.7	1229.4	1.5648	2.061	1137.1	1228.6	1.5618				
460	2.173	1147.2	1241.7	1.5783	2.124	1146.6	1241.0	1.5754				
480	2.236	1156.4	1253.6	1.5911	2.186	1155.9	1253.0	1.5883				
500	2.297	1165.3	1265.2	1.6033	2.246	1164.9	1264.6	1.6006				
550	2.445	1186.8	1293.1	1.6317	2.391	1186.5	1292.7	1.6291				
600	2.588	1207.6	1320.1	1.6578	2.532	1207.3	1319.7	1.6552				
700	2.864	1247.9	1372.4	1.7050	2.802	1247.7	1372.1	1.7025				
800	3.133	1287.8	1424.0	1.7477	3.066	1287.7	1423.8	1.7452				
900	3.398	1328.0	1475.8	1.7872	3.326	1327.9	1475.6	1.7848				
1000	3.660	1368.9	1528.1	1.8243	3.583	1368.8	1527.9	1.8219				
1100	3.921	1410.5	1581.0	1.8594	3.839	1410.4	1580.9	1.8570				
1200	4.180	1452.9	1634.7	1.8928	4.093	1452.8	1634.6	1.8904				
$P = 245$ psia, $T^{\text{sat}} = 399.19$ °F												
Sat liq.	0.019	373.4	374.2	0.5657								
Sat vap	1.880	1115.6	1200.9	1.5281								
400	1.882	1116.1	1201.4	1.5288								
420	1.950	1126.5	1214.9	1.5443								
440	2.015	1136.5	1227.8	1.5588								
460	2.077	1146.1	1240.3	1.5725								
480	2.138	1155.4	1252.3	1.5855								
500	2.197	1164.4	1264.1	1.5978								
550	2.340	1186.2	1292.3	1.6265								
600	2.478	1207.0	1319.4	1.6527								

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
700	2.744	1247.5	1371.9	1.7000				
800	3.002	1287.5	1423.6	1.7428				
900	3.257	1327.8	1475.5	1.7824				
1000	3.509	1368.7	1527.8	1.8196				
1100	3.760	1410.3	1580.8	1.8547				
1200	4.009	1452.8	1634.5	1.8881				
$P = 250$ psia, $T^{\text{sat}} = 400.97$ °F								
Sat liq.	0.019	375.3	376.1	0.5679	0.019	377.2	378.0	0.5701
Sat vap	1.843	1115.8	1201.1	1.5264	1.808	1116.0	1201.3	1.5247
420	1.907	1125.8	1214.0	1.5413	1.865	1125.1	1213.1	1.5383
440	1.970	1135.9	1227.1	1.5559	1.928	1135.3	1226.3	1.5530
460	2.032	1145.6	1239.6	1.5697	1.989	1145.0	1238.9	1.5669
480	2.092	1154.9	1251.7	1.5827	2.048	1154.5	1251.1	1.5800
500	2.150	1164.0	1263.5	1.5951	2.105	1163.6	1262.9	1.5925
520	2.207	1172.9	1275.0	1.6070	2.161	1172.5	1274.5	1.6044
550	2.291	1185.8	1291.8	1.6239	2.244	1185.5	1291.4	1.6214
600	2.426	1206.7	1319.0	1.6502	2.377	1206.5	1318.6	1.6477
700	2.687	1247.3	1371.6	1.6976	2.633	1247.1	1371.3	1.6953
800	2.941	1287.3	1423.4	1.7405	2.882	1287.2	1423.2	1.7382
900	3.191	1327.7	1475.3	1.7801	3.127	1327.5	1475.1	1.7778
1000	3.438	1368.6	1527.6	1.8173	3.370	1368.5	1527.5	1.8150
1100	3.684	1410.2	1580.6	1.8524	3.611	1410.1	1580.5	1.8502
1200	3.928	1452.7	1634.4	1.8858	3.850	1452.6	1634.3	1.8836

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
$P = 260$ psia, $T^{\text{sat}} = 404.44$												
Sat liq.	0.019	379.0	379.9	0.5722	0.019	380.8	381.7	0.5743				
Sat vap	1.774	1116.2	1201.5	1.5230	1.742	1116.3	1201.7	1.5214				
420	1.825	1124.5	1212.2	1.5353	1.786	1123.8	1211.3	1.5324				
440	1.887	1134.7	1225.5	1.5502	1.848	1134.1	1224.7	1.5474				
460	1.947	1144.5	1238.2	1.5642	1.907	1144.0	1237.5	1.5614				
480	2.005	1154.0	1250.4	1.5774	1.964	1153.5	1249.8	1.5747				
500	2.062	1153.1	1262.4	1.5899	2.020	1162.7	1261.8	1.5873				
520	2.117	1172.1	1274.0	1.6019	2.075	1171.7	1273.4	1.5993				
550	2.198	1185.1	1290.9	1.6189	2.154	1184.8	1290.4	1.6165				
600	2.329	1206.2	1318.2	1.6453	2.283	1205.9	1317.9	1.6430				
700	2.581	1246.9	1371.1	1.6930	2.531	1246.7	1370.8	1.6907				
800	2.826	1287.0	1423.0	1.7359	2.771	1286.9	1422.8	1.7337				
900	3.066	1327.4	1474.9	1.7756	3.007	1327.3	1474.8	1.7734				
1000	3.304	1368.4	1527.3	1.8128	3.241	1368.2	1527.2	1.8106				
1100	3.541	1410.0	1580.4	1.8480	3.473	1409.9	1580.3	1.8458				
1200	3.776	1452.5	1634.2	1.8814	3.704	1452.4	1634.1	1.8792				
$P = 270$ psia, $T^{\text{sat}} = 407.80$ °F												
Sat liq.	0.019	382.6	383.6	0.5764	0.019	384.4	385.4	0.5784				
Sat vap	1.710	1116.5	1201.9	1.5197	1.680	1116.6	1202.1	1.5181				
420	1.749	1123.1	1210.4	1.5295	1.713	1122.3	1209.5	1.5266				
440	1.810	1133.5	1223.9	1.5446	1.773	1132.8	1223.1	1.5419				
460	1.868	1143.4	1236.7	1.5588	1.831	1142.9	1236.0	1.5561				
480	1.925	1153.0	1249.2	1.5721	1.887	1152.5	1248.5	1.5696				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
500	1.980	1152.3	1261.2	1.5848	1.941	1161.8	1260.6	1.5823	1.941	1161.8	1260.6	1.5823
520	2.034	1171.3	1272.9	1.5969	1.994	1170.9	1272.4	1.5944	1.994	1170.9	1272.4	1.5944
550	2.112	1184.5	1290.0	1.6140	2.071	1184.1	1289.5	1.6117	2.071	1184.1	1289.5	1.6117
600	2.239	1205.6	1317.5	1.6406	2.196	1206.4	1317.1	1.6384	2.196	1206.4	1317.1	1.6384
700	2.482	1246.5	1370.5	1.6885	2.436	1246.3	1370.3	1.6863	2.436	1246.3	1370.3	1.6863
800	2.719	1286.7	1422.6	1.7315	2.668	1286.6	1422.4	1.7294	2.668	1286.6	1422.4	1.7294
900	2.951	1327.2	1474.6	1.7713	2.896	1327.0	1474.4	1.7691	2.896	1327.0	1474.4	1.7691
1000	3.181	1368.1	1527.0	1.8085	3.122	1368.0	1526.9	1.8064	3.122	1368.0	1526.9	1.8064
1100	3.408	1409.8	1580.1	1.8437	3.346	1409.8	1580.0	1.8416	3.346	1409.8	1580.0	1.8416
1200	3.635	1452.3	1634.0	1.8771	3.568	1452.3	1633.9	1.8750	3.568	1452.3	1633.9	1.8750
$P = 280$ psia, $T^{\text{sat}} = 411.07$ °F												
Sat liq.	0.019	386.2	387.1	0.5805	0.019	387.9	388.9	0.5824	0.019	387.9	388.9	0.5824
Sat vap	1.651	1116.7	1202.3	1.5166	1.622	1116.9	1202.4	1.5150	1.622	1116.9	1202.4	1.5150
420	1.678	1121.6	1208.6	1.5238	1.645	1120.9	1207.6	1.5210	1.645	1120.9	1207.6	1.5210
440	1.738	1132.2	1222.2	1.5391	1.704	1131.6	1221.4	1.5365	1.704	1131.6	1221.4	1.5365
460	1.795	1142.3	1235.3	1.5535	1.760	1141.7	1234.6	1.5509	1.760	1141.7	1234.6	1.5509
480	1.850	1152.0	1247.9	1.5670	1.815	1151.5	1247.2	1.5645	1.815	1151.5	1247.2	1.5645
500	1.904	1161.4	1260.0	1.5798	1.868	1160.9	1259.4	1.5774	1.868	1160.9	1259.4	1.5774
520	1.956	1170.5	1271.9	1.5920	1.919	1170.1	1271.3	1.5897	1.919	1170.1	1271.3	1.5897
550	2.032	1183.8	1289.1	1.6093	1.994	1183.4	1288.6	1.6070	1.994	1183.4	1288.6	1.6070
600	2.155	1205.1	1316.8	1.6361	2.115	1204.8	1316.4	1.6339	2.115	1204.8	1316.4	1.6339
700	2.391	1246.1	1370.0	1.6841	2.348	1245.9	1369.7	1.6820	2.348	1245.9	1369.7	1.6820
800	2.619	1286.4	1422.1	1.7273	2.572	1286.3	1421.9	1.7252	2.572	1286.3	1421.9	1.7252
900	2.844	1326.9	1474.2	1.7671	2.793	1326.8	1474.1	1.7650	2.793	1326.8	1474.1	1.7650

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
1000	3.066	1367.9	1526.8	1.8043	3.011	1367.8	1526.6	1.8023				
1100	3.286	1409.7	1579.9	1.8395	3.227	1409.6	1579.8	1.8375				
1200	3.504	1452.2	1633.8	1.8730	3.442	1452.1	1633.6	1.8710				
$P = 290$ psia, $T^{\text{sat}} = 414.25$ °F												
Sat liq.	0.019	389.6	390.6	0.5844	0.019	391.3	392.3	0.5863				
Sat vap	1.595	1117.0	1202.6	1.5135	1.568	1117.1	1202.7	1.5120				
420	1.612	1120.2	1206.7	1.5182	1.581	1119.5	1205.8	1.5155				
440	1.671	1130.9	1220.6	1.5338	1.639	1130.3	1219.7	1.5312				
460	1.727	1141.2	1233.8	1.5484	1.694	1140.6	1233.1	1.5458				
480	1.780	1151.0	1246.6	1.5621	1.747	1150.5	1245.9	1.5596				
500	1.833	1160.5	1258.9	1.5750	1.799	1160.0	1258.3	1.5726				
520	1.884	1169.7	1270.8	1.5873	1.849	1169.3	1270.2	1.5850				
550	1.958	1183.1	1288.1	1.6048	1.922	1182.7	1287.7	1.6025				
600	2.077	1204.5	1316.0	1.6317	2.040	1204.3	1315.6	1.6295				
700	2.306	1245.7	1369.5	1.6799	2.265	1245.5	1369.2	1.6779				
800	2.527	1286.1	1421.7	1.7232	2.483	1286.0	1421.5	1.7211				
900	2.744	1326.6	1473.9	1.7630	2.697	1326.5	1473.7	1.7610				
1000	2.958	1367.7	1526.5	1.8003	2.908	1367.6	1526.3	1.7984				
1100	3.171	1409.5	1579.6	1.8356	3.117	1409.4	1579.5	1.8336				
1200	3.382	1452.0	1633.5	1.8690	3.325	1451.9	1633.4	1.8671				
$P = 300$ psia, $T^{\text{sat}} = 394.17, 359.19$ °F												
Sat liq.	0.019	392.9	394.0	0.5882	0.019	396.2	397.3	0.5920				
Sat vap	1.543	1117.2	1202.9	1.5105	1.494	1117.5	1203.2	1.5076				
420	1.551	1118.7	1204.8	1.5127	.....	.....	.....	.....

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
440	1.608	1129.6	1218.9	1.5286	1.549	1128.3	1217.2	1.5234				
460	1.663	1140.0	1232.3	1.5433	1.603	1138.9	1230.8	1.5384				
480	1.715	1150.0	1245.2	1.5572	1.655	1149.0	1243.9	1.5525				
500	1.766	1159.6	1257.7	1.5703	1.704	1158.7	1256.5	1.5657				
520	1.816	1168.9	1269.7	1.5827	1.753	1168.1	1268.6	1.5782				
550	1.888	1182.4	1287.2	1.6003	1.823	1181.7	1286.3	1.5960				
600	2.004	1204.0	1315.2	1.6274	1.936	1203.4	1314.5	1.6233				
700	2.226	1245.3	1368.9	1.6758	2.152	1244.9	1368.4	1.6719				
800	2.441	1285.8	1421.3	1.7192	2.360	1285.5	1420.9	1.7153				
900	2.651	1326.4	1473.6	1.7591	2.564	1326.1	1473.2	1.7553				
1000	2.859	1367.5	1526.2	1.7964	2.765	1367.3	1525.9	1.7927				
1100	3.064	1409.3	1579.4	1.8317	2.964	1409.1	1579.2	1.8280				
1200	3.269	1451.9	1633.3	1.8652	3.162	1451.7	1633.1	1.8615				
	$P = 320$ psia, $T^{\text{sat}} = 423.31$ °F											
Sat liq.	0.019	399.4	400.5	0.5956	0.019	402.5	403.7	0.5991	$P = 330$ psia, $T^{\text{sat}} = 426.18$ °F			
Sat vap	1.448	1117.7	1203.4	1.5048	1.405	1117.8	1203.6	1.5021				
440	1.494	1127.0	1215.5	1.5184	1.442	1125.7	1213.8	1.5134				
460	1.547	1137.7	1229.3	1.5336	1.494	1136.6	1227.8	1.5289				
480	1.597	1147.9	1242.5	1.5478	1.544	1146.9	1241.2	1.5433				
500	1.646	1157.8	1255.2	1.5612	1.591	1156.8	1254.0	1.5568				
520	1.694	1167.2	1267.5	1.5739	1.638	1166.4	1266.4	1.5696				
550	1.762	1181.0	1285.3	1.5918	1.705	1180.2	1284.4	1.5876				
600	1.873	1202.8	1313.7	1.6192	1.813	1202.3	1313.0	1.6153				
700	2.082	1244.5	1367.8	1.6680	2.017	1244.1	1367.3	1.6643				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
800	2.284	1285.2	1420.4	1.7116	2.213	1284.9	1420.0	1.7079				
900	2.482	1325.9	1472.9	1.7516	2.405	1325.6	1472.5	1.7480				
1000	2.677	1367.0	1525.6	1.7890	2.595	1366.8	1525.3	1.7855				
1100	2.871	1408.9	1578.9	1.8243	2.783	1408.7	1578.7	1.8208				
1200	3.063	1451.5	1632.9	1.8579	2.969	1451.4	1632.7	1.8544				
$P = 340$ psia, $T^{\text{sat}} = 428.98$ °F												
Sat liq.	0.019	405.6	406.8	0.6026	0.019	408.6	409.8	0.6059				
Sat vap	1.364	1118.0	1203.8	1.4994	1.326	1118.1	1204.0	1.4968				
440	1.393	1124.3	1212.0	1.5086	1.347	1123.0	1210.2	1.5038				
460	1.444	1135.4	1226.2	1.5242	1.397	1134.2	1224.7	1.5197				
480	1.493	1145.8	1239.8	1.5388	1.445	1144.8	1238.4	1.5344				
500	1.540	1155.9	1252.8	1.5525	1.491	1154.9	1251.5	1.5483				
520	1.585	1165.6	1265.3	1.5654	1.536	1164.7	1264.2	1.5613				
550	1.651	1179.5	1283.4	1.5836	1.600	1178.8	1282.4	1.5797				
600	1.756	1201.7	1312.2	1.6114	1.703	1201.1	1311.4	1.6077				
700	1.955	1243.7	1366.7	1.6606	1.897	1243.3	1366.2	1.6571				
800	2.146	1284.6	1419.6	1.7044	2.083	1284.2	1419.2	1.7009				
900	2.333	1325.4	1472.2	1.7445	2.265	1325.1	1471.8	1.7411				
1000	2.518	1366.6	1525.0	1.7820	2.444	1366.4	1524.7	1.7787				
1100	2.700	1408.5	1578.4	1.8174	2.622	1408.3	1578.2	1.8141				
1200	2.881	1451.2	1632.5	1.8510	2.798	1451.0	1632.3	1.8477				
$P = 360$ psia, $T^{\text{sat}} = 434.41$ °F												
Sat liq.	0.019	411.5	412.8	0.6092								
Sat vap	1.289	1118.3	1204.1	1.4943								

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	
440	1.303	1121.6	1208.4	1.4990					
460	1.353	1132.9	1223.1	1.5152					
480	1.400	1143.7	1237.0	1.5301					
500	1.445	1154.0	1250.3	1.5441					
520	1.489	1163.9	1263.1	1.5573					
550	1.552	1178.1	1281.5	1.5758					
600	1.652	1200.5	1310.6	1.6040					
700	1.842	1242.9	1365.6	1.6536					
800	2.024	1283.9	1418.7	1.6976					
900	2.201	1324.8	1471.5	1.7379					
1000	2.375	1366.2	1524.4	1.7754					
1100	2.548	1408.2	1577.9	1.8109					
1200	2.720	1450.9	1632.1	1.8445					
		$P = 370$ psia, $T^{\text{sat}} = 437.04$ °F							
Sat liq.	0.019	414.4	415.7	0.6130	0.019	417.2	418.6	0.6156	
Sat vap	1.255	1118.4	1204.3	1.4918	1.222	1118.5	1204.4	1.4894	
460	1.311	1131.7	1221.4	1.5107	1.271	1130.4	1219.8	1.5063	
480	1.357	1142.6	1235.5	1.5259	1.317	1141.5	1234.1	1.5217	
500	1.402	1153.0	1249.0	1.5401	1.361	1152.0	1247.7	1.5360	
520	1.445	1163.0	1261.9	1.5534	1.403	1162.1	1260.8	1.5495	
540	1.486	1172.6	1274.4	1.5660	1.444	1171.8	1273.3	1.5622	
560	1.527	1182.0	1286.5	1.5780	1.483	1181.2	1285.5	1.5743	
580	1.566	1191.0	1298.3	1.5894	1.522	1190.4	1297.4	1.5858	
600	1.605	1199.9	1309.8	1.6004	1.560	1199.3	1309.0	1.5669	

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
700	1.790	1242.5	1365.1	1.6503	1.741	1242.1	1364.5	1.6470	1.741	1242.1	1364.5	1.6470
800	1.967	1283.6	1418.3	1.6943	1.914	1283.3	1417.9	1.6911	1.914	1283.3	1417.9	1.6911
900	2.140	1324.6	1471.1	1.7346	2.082	1324.3	1470.8	1.7315	2.082	1324.3	1470.8	1.7315
1000	2.310	1366.0	1524.1	1.7723	2.248	1365.7	1523.8	1.7692	2.248	1365.7	1523.8	1.7692
1100	2.478	1408.0	1577.7	1.8077	2.412	1407.8	1577.4	1.8047	2.412	1407.8	1577.4	1.8047
1200	2.645	1450.7	1631.8	1.8414	2.575	1450.6	1631.6	1.8384	2.575	1450.6	1631.6	1.8384
$P = 390$ psia, $T^{\text{sat}} = 442.13$ °F												
Sat liq.	0.019	420.0	421.4	0.6187	0.019	422.7	424.2	0.6217	0.019	422.7	424.2	0.6217
Sat vap	1.191	1118.6	1204.5	1.4870	1.161	1118.7	1204.6	1.4847	1.161	1118.7	1204.6	1.4847
460	1.233	1129.2	1218.2	1.5020	1.197	1127.9	1216.5	1.4978	1.197	1127.9	1216.5	1.4978
480	1.278	1140.4	1232.6	1.5176	1.242	1139.3	1231.2	1.5136	1.242	1139.3	1231.2	1.5136
500	1.321	1151.0	1246.4	1.5321	1.284	1150.0	1245.1	1.5282	1.284	1150.0	1245.1	1.5282
520	1.363	1161.2	1259.6	1.5457	1.325	1160.3	1258.4	1.5420	1.325	1160.3	1258.4	1.5420
540	1.403	1171.0	1272.3	1.5585	1.364	1170.2	1271.2	1.5549	1.364	1170.2	1271.2	1.5549
560	1.442	1180.5	1284.6	1.5707	1.403	1179.8	1283.6	1.5672	1.403	1179.8	1283.6	1.5672
580	1.480	1189.7	1296.5	1.5823	1.440	1189.1	1295.7	1.5789	1.440	1189.1	1295.7	1.5789
600	1.517	1198.8	1308.2	1.5935	1.476	1198.2	1307.4	1.5901	1.476	1198.2	1307.4	1.5901
700	1.694	1241.7	1364.0	1.6437	1.650	1241.3	1363.4	1.6406	1.650	1241.3	1363.4	1.6406
800	1.863	1283.0	1417.5	1.6880	1.815	1282.7	1417.0	1.6850	1.815	1282.7	1417.0	1.6850
900	2.028	1324.1	1470.4	1.7285	1.976	1323.8	1470.1	1.7255	1.976	1323.8	1470.1	1.7255
1000	2.190	1365.5	1523.5	1.7662	2.134	1365.3	1523.3	1.7632	2.134	1365.3	1523.3	1.7632
1100	2.350	1407.6	1577.2	1.8017	2.290	1407.4	1576.9	1.7988	2.290	1407.4	1576.9	1.7988
1200	2.508	1450.4	1631.4	1.8354	2.445	1450.2	1631.2	1.8325	2.445	1450.2	1631.2	1.8325

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
$P = 410$ psia, $T^{\text{sat}} = 447.02$ °F												
Sat liq.	0.019	425.4	426.9	0.6247	0.019	428.1	429.6	0.6276				
Sat vap	1.133	1118.7	1204.7	1.4825	1.106	1118.8	1204.7	1.4802				
460	1.163	1126.6	1214.8	1.4936	1.130	1125.3	1213.1	1.4894				
480	1.207	1138.1	1229.7	1.5096	1.173	1137.0	1228.2	1.5056				
500	1.249	1149.0	1243.8	1.5244	1.215	1148.0	1242.4	1.5206				
520	1.289	1159.4	1257.2	1.5383	1.254	1158.5	1256.0	1.5347				
540	1.328	1169.4	1270.2	1.5514	1.293	1168.6	1289.1	1.5479				
560	1.365	1179.1	1282.7	1.5637	1.330	1178.3	1281.7	1.5603				
580	1.402	1188.4	1294.8	1.5755	1.366	1187.8	1293.9	1.5722				
600	1.438	1197.6	1306.6	1.5868	1.401	1196.9	1305.8	1.5835				
700	1.608	1240.8	1362.8	1.6375	1.568	1240.4	1362.3	1.6345				
800	1.769	1282.4	1416.6	1.6820	1.726	1282.0	1416.2	1.6791				
900	1.926	1323.6	1469.7	1.7226	1.879	1323.3	1469.4	1.7197				
1000	2.081	1365.1	1523.0	1.7603	2.030	1364.9	1522.7	1.7575				
1100	2.233	1407.2	1576.7	1.7959	2.180	1407.0	1576.4	1.7932				
1200	2.385	1450.1	1631.0	1.8297	2.327	1449.9	1630.8	1.8269				
$P = 430$ psia, $T^{\text{sat}} = 451.74$ °F												
Sat liq.	0.020	430.6	432.2	0.6304	0.020	433.2	434.8	0.6332				
Sat vap	1.080	1118.8	1204.8	1.4781	1.055	1118.8	1204.8	1.4759				
460	1.099	1123.9	1211.4	1.4853	1.069	1122.6	1209.6	1.4812				
480	1.142	1135.8	1226.6	1.5017	1.111	1134.6	1225.1	1.4979				
500	1.183	1147.0	1241.1	1.5169	1.152	1145.9	1239.7	1.5132				
520	1.222	1157.6	1254.8	1.5311	1.190	1156.7	1253.6	1.5276				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
540	1.259	1167.8	1268.0	1.5444	1.227	1167.0	1266.9	1.5410	1.227	1167.0	1266.9	1.5410
560	1.296	1177.6	1280.7	1.5570	1.263	1176.9	1279.7	1.5537	1.263	1176.9	1279.7	1.5537
580	1.331	1187.1	1293.0	1.5689	1.298	1186.4	1292.1	1.5657	1.298	1186.4	1292.1	1.5657
600	1.366	1196.3	1305.0	1.5804	1.332	1195.7	1304.2	1.5772	1.332	1195.7	1304.2	1.5772
700	1.529	1240.0	1361.7	1.6315	1.493	1239.6	1361.1	1.6286	1.493	1239.6	1361.1	1.6286
800	1.684	1281.7	1415.7	1.6762	1.644	1281.4	1415.3	1.6734	1.644	1281.4	1415.3	1.6734
900	1.835	1323.0	1469.0	1.7169	1.792	1322.8	1468.7	1.7142	1.792	1322.8	1468.7	1.7142
1000	1.982	1364.6	1522.4	1.7548	1.936	1364.4	1522.1	1.7521	1.936	1364.4	1522.1	1.7521
1100	2.128	1406.8	1576.2	1.7904	2.079	1406.6	1575.9	1.7878	2.079	1406.6	1575.9	1.7878
1200	2.273	1449.7	1630.6	1.8242	2.220	1449.6	1630.4	1.8216	2.220	1449.6	1630.4	1.8216
$P = 450$ psia, $T^{\text{sat}} = 456.28$ °F												
Sat liq.	0.020	435.7	437.3	0.6360	0.020	438.2	439.8	0.6387	0.020	438.2	439.8	0.6387
Sat vap	1.032	1118.9	1204.8	1.4738	1.009	1118.9	1204.8	1.4718	1.009	1118.9	1204.8	1.4718
460	1.040	1121.2	1207.8	1.4771	1.012	1119.8	1206.0	1.4731	1.012	1119.8	1206.0	1.4731
480	1.082	1133.4	1223.5	1.4940	1.054	1132.2	1222.0	1.4903	1.054	1132.2	1222.0	1.4903
500	1.122	1144.9	1238.3	1.5096	1.094	1143.8	1236.9	1.5060	1.094	1143.8	1236.9	1.5060
520	1.160	1155.8	1252.4	1.5241	1.132	1154.8	1251.1	1.5207	1.132	1154.8	1251.1	1.5207
540	1.197	1166.1	1265.8	1.5377	1.168	1165.3	1264.7	1.5344	1.168	1165.3	1264.7	1.5344
560	1.232	1176.1	1278.7	1.5505	1.203	1175.4	1277.7	1.5473	1.203	1175.4	1277.7	1.5473
580	1.266	1185.7	1291.2	1.5626	1.236	1185.1	1290.3	1.5595	1.236	1185.1	1290.3	1.5595
600	1.300	1195.1	1303.3	1.5742	1.269	1194.5	1302.5	1.5711	1.269	1194.5	1302.5	1.5711
700	1.458	1239.2	1360.6	1.6258	1.424	1238.8	1360.0	1.6230	1.424	1238.8	1360.0	1.6230
800	1.607	1281.1	1414.9	1.6707	1.570	1280.8	1414.4	1.6680	1.570	1280.8	1414.4	1.6680
900	1.751	1322.5	1468.3	1.7115	1.712	1322.3	1468.0	1.7089	1.712	1322.3	1468.0	1.7089

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
1000	1.892	1364.2	1521.8	1.7495	1.850	1364.0	1521.5	1.7469				
1100	2.032	1406.5	1575.7	1.7852	1.987	1406.3	1575.4	1.7826				
1200	2.170	1449.4	1630.1	1.8190	2.123	1449.3	1629.9	1.8165				
$P = 470$ psia, $T^{\text{sat}} = 460.68$ °F												
Sat liq.	0.020	440.6	442.3	0.6413	0.020	443.0	444.8	0.6439				
Sat vap	0.988	1118.9	1204.8	1.5697	0.967	1118.9	1204.8	1.4677				
480	1.028	1131.0	1220.4	1.4865	1.002	1129.8	1218.8	1.4828				
500	1.067	1142.8	1235.5	1.5025	1.041	1141.7	1234.1	1.4990				
520	1.104	1153.9	1249.9	1.5173	1.078	1152.9	1248.6	1.5139				
540	1.140	1164.5	1263.6	1.5311	1.113	1163.6	1262.4	1.5279				
560	1.174	1174.6	1276.7	1.5441	1.147	1173.8	1275.7	1.5410				
580	1.207	1184.4	1289.4	1.5564	1.180	1183.7	1288.5	1.5534				
600	1.240	1193.9	1301.7	1.5681	1.211	1193.2	1300.8	1.5652				
700	1.392	1238.3	1359.4	1.6202	1.361	1237.9	1358.8	1.6176				
800	1.536	1280.4	1414.0	1.6654	1.502	1280.1	1413.6	1.6628				
900	1.674	1322.0	1467.6	1.7064	1.638	1321.7	1467.3	1.7038				
1000	1.810	1363.8	1521.2	1.7444	1.772	1363.5	1520.9	1.7419				
1100	1.944	1406.1	1575.2	1.7802	1.903	1405.9	1574.9	1.7777				
1200	2.077	1449.1	1629.7	1.8141	2.033	1448.9	1629.5	1.8116				
$P = 490$ psia, $T^{\text{sat}} = 464.93$ °F												
Sat liq.	0.020	445.4	447.2	0.6465	0.020	447.7	449.5	0.6490				
Sat vap	0.947	1118.9	1204.7	1.4658	0.928	1118.8	1204.7	1.4639				
480	0.977	1128.5	1217.1	1.4791	0.954	1127.2	1215.5	1.4755				
500	1.016	1140.6	1232.7	1.4955	0.992	1139.5	1231.2	1.4921				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
520	1.052	1151.9	1247.4	1.5106	1.028	1151.0	1246.1	1.5074	1.028	1151.0	1246.1	1.5074
540	1.087	1162.7	1261.3	1.5247	1.062	1161.9	1260.2	1.5216	1.062	1161.9	1260.2	1.5216
560	1.121	1173.1	1274.7	1.5380	1.095	1172.3	1273.6	1.5349	1.095	1172.3	1273.6	1.5349
580	1.153	1183.0	1287.5	1.5504	1.127	1182.3	1286.6	1.5475	1.127	1182.3	1286.6	1.5475
600	1.184	1192.6	1300.0	1.5623	1.158	1192.0	1299.1	1.5595	1.158	1192.0	1299.1	1.5595
700	1.332	1237.5	1358.3	1.6149	1.304	1237.1	1357.7	1.6123	1.304	1237.1	1357.7	1.6123
800	1.470	1279.8	1413.1	1.6603	1.440	1279.5	1412.7	1.6578	1.440	1279.5	1412.7	1.6578
900	1.604	1321.5	1466.9	1.7014	1.571	1321.2	1466.6	1.6990	1.571	1321.2	1466.6	1.6990
1000	1.735	1363.3	1520.6	1.7395	1.699	1363.1	1520.3	1.7371	1.699	1363.1	1520.3	1.7371
1100	1.864	1405.7	1574.7	1.7753	1.826	1405.5	1574.4	1.7730	1.826	1405.5	1574.4	1.7730
1200	1.991	1448.8	1629.3	1.8093	1.951	1448.6	1629.1	1.8069	1.951	1448.6	1629.1	1.8069
$P = 510$ psia, $T^{\text{sat}} = 469.05$ °F												
Sat liq.	0.020	450.0	451.9	0.6515	0.020	452.3	454.2	0.6539	$P = 520$ psia, $T^{\text{sat}} = 471.07$ °F			
Sat vap	0.909	1118.8	1204.6	1.4620	0.891	1118.8	1204.5	1.4601	0.891	1118.8	1204.5	1.4601
480	0.931	1126.0	1213.8	1.4718	0.909	1124.7	1212.1	1.4682	0.909	1124.7	1212.1	1.4682
500	0.969	1138.4	1229.8	1.4886	0.947	1137.2	1228.3	1.4853	0.947	1137.2	1228.3	1.4853
520	1.005	1150.0	1244.8	1.5041	0.982	1149.0	1243.5	1.5009	0.982	1149.0	1243.5	1.5009
540	1.039	1161.0	1259.0	1.5185	1.016	1160.1	1257.8	1.5154	1.016	1160.1	1257.8	1.5154
560	1.071	1171.5	1272.6	1.5319	1.048	1170.7	1271.5	1.5290	1.048	1170.7	1271.5	1.5290
580	1.103	1181.6	1285.7	1.5446	1.079	1180.9	1284.7	1.5418	1.079	1180.9	1284.7	1.5418
600	1.133	1191.3	1298.3	1.5567	1.109	1190.7	1297.4	1.5539	1.109	1190.7	1297.4	1.5539
700	1.277	1236.6	1357.1	1.6097	1.250	1236.2	1356.5	1.6072	1.250	1236.2	1356.5	1.6072
800	1.410	1279.2	1412.2	1.6554	1.382	1278.8	1411.8	1.6530	1.382	1278.8	1411.8	1.6530
900	1.539	1321.0	1466.2	1.6966	1.509	1320.7	1465.9	1.6943	1.509	1320.7	1465.9	1.6943

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
1000	1.665	1362.9	1520.0	1.7348	1.632	1362.7	1519.7	1.7325	1.632	1362.7	1519.7	1.7325
1100	1.789	1405.3	1574.2	1.7707	1.754	1405.1	1573.9	1.7684	1.754	1405.1	1573.9	1.7684
1200	1.912	1448.4	1628.9	1.8047	1.875	1448.3	1628.7	1.8024	1.875	1448.3	1628.7	1.8024
$P = 530$ psia, $T^{\text{sat}} = 473.05$ °F												
Sat liq.	0.020	454.5	456.5	0.6564								
Sat vap	0.874	1118.7	1204.5	1.4583								
480	0.888	1123.4	1210.4	1.4646								
500	0.925	1136.1	1226.8	1.4819								
520	0.960	1148.0	1242.2	1.4977								
540	0.994	1159.2	1256.7	1.5124								
560	1.026	1169.9	1270.5	1.5261								
580	1.056	1180.1	1283.8	1.5390								
600	1.086	1190.0	1296.5	1.5512								
700	1.225	1235.8	1355.9	1.6047								
800	1.355	1278.5	1411.4	1.6506								
900	1.479	1320.4	1465.5	1.6920								
1000	1.601	1362.4	1519.4	1.7302								
1100	1.720	1404.9	1573.7	1.7662								
1200	1.839	1448.1	1628.4	1.8002								
$P = 550$ psia, $T^{\text{sat}} = 476.94$ °F												
Sat liq.	0.020	456.7	458.7	0.6587	0.020	458.9	460.9	0.0611	0.020	458.9	460.9	0.0611
Sat vap	0.858	1118.7	1204.4	1.4565	0.842	1118.6	1204.3	1.4547	0.842	1118.6	1204.3	1.4547
500	0.905	1134.9	1225.3	1.4786	0.885	1133.8	1223.8	1.4753	0.885	1133.8	1223.8	1.4753
520	0.939	1147.0	1240.8	1.4946	0.919	1145.8	1239.5	1.4915	0.919	1145.8	1239.5	1.4915

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
540	0.973	1158.3	1255.5	1.5094	0.952	1157.4	1254.3	1.5064				
560	1.004	1169.1	1269.4	1.5232	0.983	1168.3	1268.4	1.5203				
580	1.035	1179.4	1282.8	1.5362	1.013	1178.7	1281.8	1.5334				
600	1.064	1189.4	1295.7	1.5484	1.042	1188.7	1294.8	1.5458				
650	1.134	1213.0	1326.3	1.5767	1.112	1212.4	1325.6	1.5742				
700	1.201	1235.3	1355.3	1.6023	1.178	1234.9	1354.7	1.5999				
750	1.266	1257.0	1383.4	1.6260	1.241	1256.6	1382.9	1.6237				
800	1.328	1278.2	1410.9	1.6483	1.303	1277.9	1410.5	1.6460				
900	1.451	1320.2	1465.1	1.6897	1.424	1319.9	1464.8	1.6875				
1000	1.570	1362.2	1519.1	1.7280	1.541	1362.0	1518.9	1.7259				
1100	1.888	1404.8	1573.4	1.7640	1.657	1404.6	1573.2	1.7619				
1200	1.804	1447.9	1682.2	1.7981	1.771	1447.8	1628.0	1.7959				
$P = 560$ psia, $T^{\text{sat}} = 478.84$ °F												
Sat liq.	0.020	461.1	463.1	0.6634	0.020	463.2	465.3	0.6657	$P = 570$ psia, $T^{\text{sat}} = 480.72$ °F			
Sat vap	0.826	1118.5	1204.2	1.4529	0.812	1118.5	1204.1	1.4512				
500	0.865	1132.6	1222.2	1.4720	0.847	1131.4	1220.7	1.4687				
520	0.900	1144.9	1238.1	1.4884	0.881	1143.9	1236.8	1.4853				
540	0.932	1156.5	1253.1	1.5035	0.913	1155.6	1251.9	1.5005				
560	0.963	1167.5	1267.3	1.5175	0.944	1166.6	1266.2	1.5147				
580	0.993	1178.0	1280.9	1.5307	0.973	1177.2	1279.9	1.5280				
600	1.022	1188.0	1293.9	1.5431	1.002	1187.4	1293.0	1.5405				
650	1.090	1211.9	1324.9	1.5717	1.069	1211.4	1324.2	1.5693				
700	1.155	1234.4	1354.2	1.5975	1.133	1234.0	1353.6	1.5952				
750	1.218	1256.2	1382.4	1.6214	1.195	1255.8	1381.9	1.6191				
800	1.279	1277.5	1410.0	1.6438	1.255	1277.2	1409.6	1.6415				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
900	1.397	1319.6	1464.4	1.6853	1.372	1319.4	1464.1	1.6832	1.372	1319.4	1464.1	1.6832
1000	1.513	1361.8	1518.6	1.7237	1.486	1361.6	1518.3	1.7216	1.486	1361.6	1518.3	1.7216
1100	1.627	1404.4	1572.9	1.7598	1.597	1404.2	1572.7	1.7577	1.597	1404.2	1572.7	1.7577
1200	1.739	1447.6	1627.8	1.7939	1.708	1447.5	1627.6	1.7918	1.708	1447.5	1627.6	1.7918
$P = 580$ psia, $T^{\text{sat}} = 482.57$ °F												
Sat liq.	0.020	465.3	467.5	0.6679	0.020	467.4	469.6	0.6701	0.020	467.4	469.6	0.6701
Sat vap	0.797	1118.4	1203.9	1.4495	0.783	1118.3	1203.8	1.4478	0.783	1118.3	1203.8	1.4478
500	0.829	1130.2	1219.1	1.4654	0.811	1129.0	1217.5	1.4622	0.811	1129.0	1217.5	1.4622
520	0.863	1142.8	1235.4	1.4822	0.845	1141.7	1234.0	1.4792	0.845	1141.7	1234.0	1.4792
540	0.895	1154.6	1250.7	1.4976	0.877	1153.7	1249.4	1.4948	0.877	1153.7	1249.4	1.4948
560	0.925	1165.8	1265.1	1.5120	0.907	1165.0	1264.0	1.5092	0.907	1165.0	1264.0	1.5092
580	0.954	1176.5	1278.9	1.5254	0.936	1175.7	1277.9	1.5227	0.936	1175.7	1277.9	1.5227
600	0.982	1186.7	1292.1	1.5380	0.964	1186.0	1291.2	1.5354	0.964	1186.0	1291.2	1.5354
650	1.049	1210.8	1323.4	1.5668	1.030	1210.3	1322.7	1.5645	1.030	1210.3	1322.7	1.5645
700	1.112	1233.6	1353.0	1.5929	1.092	1233.1	1352.4	1.5906	1.092	1233.1	1352.4	1.5906
750	1.173	1255.5	1381.4	1.6169	1.152	1255.1	1380.9	1.6147	1.152	1255.1	1380.9	1.6147
800	1.232	1276.9	1409.2	1.6394	1.210	1276.5	1408.7	1.6372	1.210	1276.5	1408.7	1.6372
900	1.347	1319.1	1463.7	1.6811	1.324	1318.9	1463.4	1.6790	1.324	1318.9	1463.4	1.6790
1000	1.459	1361.3	1518.0	1.7196	1.434	1361.1	1517.7	1.7175	1.434	1361.1	1517.7	1.7175
1100	1.569	1404.0	1572.4	1.7556	1.542	1403.8	1572.2	1.7536	1.542	1403.8	1572.2	1.7536
1200	1.678	1447.3	1627.4	1.7898	1.649	1447.1	1627.2	1.7879	1.649	1447.1	1627.2	1.7879
$P = 610$ psia, $T^{\text{sat}} = 487.98$ °F												
Sat liq.	0.020	469.5	471.7	0.6723	0.020	471.5	473.8	0.6745	0.020	471.5	473.8	0.6745
Sat vap	0.770	1118.2	1203.7	1.4461	0.757	1118.1	1203.5	1.4445	0.757	1118.1	1203.5	1.4445
500	0.794	1127.7	1215.9	1.4590	0.778	1126.5	1214.3	1.4558	0.778	1126.5	1214.3	1.4558

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
520	0.828	1140.7	1232.6	1.4762	0.811	1139.6	1231.2	1.4732	0.811	1139.6	1231.2	1.4732
540	0.860	1152.8	1248.2	1.4919	0.843	1151.8	1246.9	1.4891	0.843	1151.8	1246.9	1.4891
560	0.889	1164.1	1262.9	1.5065	0.872	1163.3	1261.8	1.5038	0.872	1163.3	1261.8	1.5038
580	0.918	1175.0	1276.9	1.5201	0.901	1174.2	1275.9	1.5175	0.901	1174.2	1275.9	1.5175
600	0.946	1185.3	1290.3	1.5329	0.928	1184.7	1289.4	1.5304	0.928	1184.7	1289.4	1.5304
650	1.011	1209.8	1322.0	1.5621	0.993	1209.2	1321.3	1.5598	0.993	1209.2	1321.3	1.5598
700	1.073	1232.7	1351.8	1.5884	1.054	1232.2	1351.2	1.5861	1.054	1232.2	1351.2	1.5861
750	1.132	1254.7	1380.4	1.6125	1.112	1254.3	1379.9	1.6104	1.112	1254.3	1379.9	1.6104
800	1.189	1276.2	1408.3	1.6351	1.169	1275.9	1407.8	1.6330	1.169	1275.9	1407.8	1.6330
900	1.301	1318.6	1463.0	1.6769	1.279	1318.3	1462.7	1.6749	1.279	1318.3	1462.7	1.6749
1000	1.409	1360.9	1517.4	1.7155	1.386	1360.7	1517.1	1.7135	1.386	1360.7	1517.1	1.7135
1100	1.516	1403.6	1571.9	1.7517	1.491	1403.4	1571.7	1.7497	1.491	1403.4	1571.7	1.7497
1200	1.621	1447.0	1627.0	1.7859	1.594	1446.8	1626.7	1.7839	1.594	1446.8	1626.7	1.7839
$P = 620$ psia, $T^{\text{sat}} = 489.74$ °F												
Sat liq.	0.020	473.5	475.8	0.6766	0.020	475.5	477.9	0.6787	0.020	475.5	477.9	0.6787
Sat vap	0.744	1118.0	1203.4	1.4428	0.732	1117.9	1203.2	1.4412	0.732	1117.9	1203.2	1.4412
500	0.762	1125.2	1212.7	1.4526	0.747	1123.9	1211.0	1.4494	0.747	1123.9	1211.0	1.4494
520	0.795	1138.5	1229.7	1.4702	0.780	1137.4	1228.3	1.4672	0.780	1137.4	1228.3	1.4672
540	0.827	1150.8	1245.7	1.4863	0.811	1149.9	1244.4	1.4835	0.811	1149.9	1244.4	1.4835
560	0.856	1162.4	1260.7	1.5011	0.840	1161.6	1259.5	1.4985	0.840	1161.6	1259.5	1.4985
580	0.884	1173.5	1274.9	1.5150	0.868	1172.7	1273.9	1.5124	0.868	1172.7	1273.9	1.5124
600	0.911	1184.0	1288.5	1.5279	0.895	1183.3	1287.6	1.5255	0.895	1183.3	1287.6	1.5255
650	0.975	1208.7	1320.5	1.5575	0.958	1208.1	1319.8	1.5552	0.958	1208.1	1319.8	1.5552
700	1.035	1231.8	1350.6	1.5839	1.017	1231.3	1350.0	1.5818	1.017	1231.3	1350.0	1.5818

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
750	1.093	1253.9	1379.3	1.6082	1.074	1253.6	1378.8	1.6062	1.130	1275.2	1406.9	1.6289
800	1.149	1275.6	1407.4	1.6310	1.236	1317.8	1461.9	1.6710	1.340	1360.2	1516.5	1.7097
900	1.257	1318.1	1462.3	1.6729	1.442	1403.1	1571.2	1.7459	1.543	1446.5	1626.3	1.7802
1000	1.363	1360.5	1516.8	1.7116	$P = 650$ psia, $T^{\text{sat}} = 494.89$ °F							
1100	1.466	1403.2	1571.4	1.7478								
1200	1.568	1446.6	1626.5	1.7820	$P = 640$ psia, $T^{\text{sat}} = 493.19$ °F							
Sat liq.	0.020	477.5	479.9	0.6808									0.0203	479.5	481.9	0.6828
Sat vap	0.720	1117.8	1203.0	1.4396	0.7084	1117.6	1202.8	1.4381				
500	0.732	1122.7	1209.3	1.4462	0.7173	1121.3	1207.6	1.4430				
520	0.765	1136.3	1226.8	1.4643	0.7501	1135.1	1225.4	1.4614				
540	0.796	1148.9	1243.1	1.4807	0.7808	1147.9	1241.8	1.4780				
560	0.825	1160.7	1258.4	1.4959	0.8096	1159.8	1257.2	1.4932				
580	0.852	1171.9	1272.8	1.5099	0.8371	1171.1	1271.8	1.5074				
600	0.879	1182.6	1286.7	1.5231	0.8634	1181.9	1285.7	1.5207				
650	0.942	1207.6	1319.1	1.5530	0.9254	1207.0	1318.3	1.5507				
700	1.000	1230.9	1349.3	1.5797	0.9835	1230.4	1348.7	1.5775				
750	1.056	1253.2	1378.3	1.6041	1.0390	1252.8	1377.8	1.6021				
800	1.111	1274.9	1406.5	1.6269	1.0930	1274.6	1406.0	1.6249				
900	1.216	1317.5	1461.6	1.6690	1.1970	1317.3	1461.2	1.6671				
1000	1.319	1360.0	1516.2	1.7078	1.2980	1359.8	1515.9	1.7059				
1100	1.419	1402.9	1570.9	1.7441	1.3970	1402.7	1570.7	1.7422				
1200	1.518	1446.3	1626.1	1.7783	1.4940	1446.1	1625.9	1.7765				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
	$P = 660$ psia, $T^{\text{sat}} = 496.57$ °F				$P = 670$ psia, $T^{\text{sat}} = 498.22$ °F							
Sat liq.	0.0204	481.4	483.9	0.6849	0.0204	483.3	485.8	0.6869				
Sat vap	0.6972	1117.5	1202.7	1.4365	0.6864	1117.4	1202.5	1.4350				
500	0.7031	1120.0	1205.9	1.4399	0.6894	1118.7	1204.2	1.4367				
520	0.7359	1134.0	1223.9	1.4584	0.7221	1132.8	1222.4	1.4555				
540	0.7664	1146.9	1240.5	1.4752	0.7525	1145.9	1239.2	1.4725				
560	0.7951	1159.0	1256.1	1.4907	0.7810	1158.1	1254.9	1.4881				
580	0.8224	1170.3	1270.8	1.5049	0.8080	1169.6	1269.7	1.5025				
600	0.8485	1181.2	1284.8	1.5183	0.8339	1180.5	1283.9	1.5159				
650	0.9098	1206.5	1317.6	1.5485	0.8947	1205.9	1316.8	1.5463				
700	0.9673	1230.0	1348.1	1.5755	0.9516	1229.5	1347.5	1.5734				
750	1.0220	1252.4	1377.3	1.6001	1.0060	1252.0	1376.7	1.5981				
800	1.0750	1274.2	1405.6	1.6230	1.0580	1273.9	1405.1	1.6211				
900	1.1780	1317.0	1460.9	1.6652	1.1600	1316.7	1460.5	1.6634				
1000	1.2780	1359.6	1515.6	1.7041	1.2580	1359.3	1515.3	1.7023				
1100	1.3750	1402.5	1570.4	1.7404	1.3540	1402.3	1570.2	1.7387				
1200	1.4710	1446.0	1625.7	1.7748	1.4490	1445.8	1625.5	1.7730				
	$P = 680$ psia, $T^{\text{sat}} = 499.86$ °F				$P = 690$ psia, $T^{\text{sat}} = 501.48$ °F							
Sat liq.	0.0204	485.2	487.8	0.6889	0.0205	487.1	489.7	0.6908				
Sat vap	0.6758	1117.2	1202.3	1.4334	0.6655	1117.1	1202.1	1.4319				
500	0.6760	1117.3	1202.4	1.4336	.....	.....	.....	.....
520	0.7087	1131.7	1220.8	1.4526	0.6956	1130.5	1219.3	1.4497				
540	0.7389	1144.9	1237.9	1.4698	0.7257	1143.9	1236.5	1.4671				
560	0.7673	1157.2	1253.7	1.4855	0.7539	1156.3	1252.5	1.4830				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
580	0.7941	1168.8	1268.7	1.5000	0.7806	1168.0	1267.6	1.4976				
600	0.8198	1179.8	1282.9	1.5136	0.8061	1179.0	1282.0	1.5113				
650	0.8801	1205.3	1316.1	1.5442	0.8658	1204.8	1315.3	1.5421				
700	0.9364	1229.1	1346.9	1.5714	0.9216	1228.6	1346.3	1.5693				
750	0.9900	1251.6	1376.2	1.5961	0.9746	1251.3	1375.7	1.5942				
800	1.0420	1273.6	1404.7	1.6192	1.0260	1273.2	1404.2	1.6173				
900	1.1420	1316.5	1460.2	1.6616	1.1250	1316.2	1459.8	1.6598				
1000	1.2390	1359.1	1515.0	1.7005	1.2200	1358.9	1514.7	1.6987				
1100	1.3340	1402.1	1569.9	1.7369	1.3140	1401.9	1569.7	1.7352				
1200	1.4270	1445.7	1625.3	1.7713	1.4060	1445.5	1625.0	1.7696				
$P = 700$ psia, $T^{\text{sat}} = 503.08$ °F												
Sat liq.	0.0205	489.0	491.6	0.6928								
Sat vap	0.6556	1116.9	1201.8	1.4304								
520	0.6829	1129.3	1217.8	1.4468								
540	0.7129	1142.8	1235.2	1.4644								
560	0.7409	1155.4	1251.3	1.4805								
580	0.7675	1167.1	1266.6	1.4952								
600	0.7928	1178.3	1281.0	1.5090								
650	0.8520	1204.2	1314.6	1.5399								
700	0.9072	1228.1	1345.6	1.5673								
750	0.9596	1250.9	1375.2	1.5923								
800	1.0100	1272.9	1403.7	1.6154								
900	1.1080	1315.9	1459.4	1.6580								
1000	1.2020	1358.7	1514.4	1.6970								

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
1100	1.2950	1401.7	1569.4	1.7335								
1200	1.3860	1445.3	1624.8	1.7679								
$P = 725$ psia, $T^{\text{sat}} = 507.01$ °F												
Sat liq.	0.0206	493.5	496.3	0.6975	0.0207	498.0	500.9	0.7022				
Sat vap	0.6318	1116.5	1201.3	1.4268	0.6095	1116.1	1200.7	1.4232				
520	0.6525	1126.3	1213.8	1.4396	0.6240	1123.1	1209.7	1.4325				
540	0.6823	1140.2	1231.7	1.4578	0.6536	1137.5	1228.2	1.4511				
560	0.7100	1153.1	1248.3	1.4742	0.6811	1150.7	1245.2	1.4680				
580	0.7362	1165.1	1263.9	1.4893	0.7069	1163.0	1261.1	1.4835				
600	0.7610	1176.5	1278.6	1.5033	0.7313	1174.6	1276.1	1.4977				
620	0.7848	1187.3	1292.6	1.5164	0.7547	1185.6	1290.4	1.5111				
650	0.8190	1202.8	1312.6	1.5347	0.7882	1201.3	1310.7	1.5296				
700	0.8729	1227.0	1344.1	1.5624	0.8409	1225.8	1342.5	1.5577				
750	0.9240	1249.9	1373.8	1.5876	0.8907	1248.9	1372.5	1.5830				
800	0.9732	1272.0	1402.6	1.6109	0.9386	1271.2	1401.5	1.6065				
900	1.0680	1315.3	1458.5	1.6536	1.0310	1314.6	1457.6	1.6494				
1000	1.1590	1358.1	1513.7	1.6927	1.1190	1357.6	1512.9	1.6886				
1100	1.2490	1401.3	1568.8	1.7293	1.2060	1400.8	1568.2	1.7252				
1200	1.3370	1444.9	1624.3	1.7638	1.2920	1444.5	1623.8	1.7598				
$P = 775$ psia, $T^{\text{sat}} = 514.57$ °F												
Sat liq.	0.0208	502.4	505.4	0.7067	0.0209	506.7	509.8	0.7111				
Sat vap	0.5886	1115.6	1200.1	1.4197	0.5690	1115.2	1199.4	1.4163				
520	0.5971	1119.9	1205.6	1.4253	0.5717	1116.6	1201.2	1.4182				
540	0.6267	1134.7	1224.6	1.4446	0.6013	1131.9	1220.9	1.4381				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
560	0.6539	1148.3	1242.1	1.4619	0.6283	1145.9	1238.9	1.4558	0.6283	1145.9	1238.9	1.4558
580	0.6794	1160.9	1258.3	1.4777	0.6536	1158.8	1255.5	1.4720	0.6536	1158.8	1255.5	1.4720
600	0.7035	1172.7	1273.6	1.4923	0.6774	1170.8	1271.1	1.4868	0.6774	1170.8	1271.1	1.4868
620	0.7265	1183.9	1288.1	1.5058	0.7000	1182.2	1285.9	1.5007	0.7000	1182.2	1285.9	1.5007
650	0.7594	1199.9	1308.8	1.5247	0.7323	1198.4	1306.8	1.5198	0.7323	1198.4	1306.8	1.5198
700	0.8109	1224.6	1340.9	1.5530	0.7828	1223.4	1339.3	1.5484	0.7828	1223.4	1339.3	1.5484
750	0.8595	1247.9	1371.2	1.5786	0.8303	1246.9	1369.8	1.5742	0.8303	1246.9	1369.8	1.5742
800	0.9062	1270.3	1400.3	1.6022	0.8759	1269.5	1399.1	1.5980	0.8759	1269.5	1399.1	1.5980
900	0.9957	1313.9	1456.7	1.6453	0.9631	1313.2	1455.8	1.6413	0.9631	1313.2	1455.8	1.6413
1000	1.0820	1357.0	1512.2	1.6846	1.0470	1356.4	1511.4	1.6807	1.0470	1356.4	1511.4	1.6807
1100	1.1660	1400.3	1567.6	1.7213	1.1290	1399.8	1566.9	1.7175	1.1290	1399.8	1566.9	1.7175
1200	1.2490	1444.1	1623.2	1.7559	1.2090	1443.7	1622.7	1.7522	1.2090	1443.7	1622.7	1.7522
$P = 825$ psia, $T^{\text{sat}} = 521.76$ °F												
Sat liq.	0.0210	510.9	514.1	0.7155	0.0211	515.1	518.4	0.7197	$P = 850$ psia, $T^{\text{sat}} = 525.24$ °F			
Sat vap	0.5505	1114.6	1198.7	1.4129	0.5330	1114.1	1198.0	1.4096	0.5330	1114.1	1198.0	1.4096
540	0.5773	1129.0	1217.1	1.4315	0.5546	1126.0	1213.3	1.4250	0.5546	1126.0	1213.3	1.4250
560	0.6042	1143.4	1235.6	1.4498	0.5815	1140.8	1232.2	1.4439	0.5815	1140.8	1232.2	1.4439
580	0.6293	1156.6	1252.6	1.4664	0.6063	1154.3	1249.7	1.4608	0.6063	1154.3	1249.7	1.4608
600	0.6528	1168.9	1268.5	1.4815	0.6296	1166.9	1265.9	1.4763	0.6296	1166.9	1265.9	1.4763
620	0.6751	1180.5	1283.6	1.4956	0.6516	1178.7	1281.2	1.4906	0.6516	1178.7	1281.2	1.4906
650	0.7069	1196.9	1304.8	1.5150	0.6829	1195.3	1302.8	1.5102	0.6829	1195.3	1302.8	1.5102
700	0.7564	1222.2	1337.7	1.5440	0.7315	1221.0	1336.0	1.5396	0.7315	1221.0	1336.0	1.5396
750	0.8029	1245.9	1368.5	1.5700	0.7770	1244.9	1367.1	1.5658	0.7770	1244.9	1367.1	1.5658
800	0.8473	1268.6	1398.0	1.5939	0.8205	1267.7	1396.8	1.5899	0.8205	1267.7	1396.8	1.5899

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
900	0.9323	1312.6	1454.9	1.6374	0.9034	1311.9	1454.0	1.6336				
1000	1.0140	1355.9	1510.7	1.6770	0.9830	1355.3	1510.0	1.6733				
1100	1.0940	1399.3	1566.3	1.7138	1.0610	1398.9	1565.7	1.7102				
1200	1.1720	1443.3	1622.2	1.7485	1.1370	1442.9	1621.6	1.7450				
$P = 875$ psia, $T^{\text{sat}} = 528.63$ °F												
Sat liq.	0.0211	519.2	522.6	0.7238	0.0212	523.2	526.7	0.7279				
Sat vap	0.5165	1113.6	1197.2	1.4064	0.5009	1113.0	1196.4	1.4032				
540	0.5330	1123.0	1209.3	1.4185	0.5126	1119.8	1205.2	1.4120				
560	0.5599	1138.2	1228.8	1.4379	0.5394	1135.5	1225.3	1.4320				
580	0.5846	1152.0	1246.7	1.4553	0.5640	1149.7	1243.6	1.4498				
600	0.6077	1164.9	1263.3	1.4711	0.5869	1162.8	1260.6	1.4659				
620	0.6294	1176.9	1278.8	1.4856	0.6084	1175.1	1276.4	1.4807				
650	0.6602	1193.8	1300.7	1.5056	0.6388	1192.2	1298.6	1.5010				
700	0.7080	1219.7	1334.4	1.5353	0.6858	1218.5	1332.7	1.5311				
750	0.7526	1243.9	1365.7	1.5618	0.7296	1242.8	1364.3	1.5578				
800	0.7952	1266.9	1395.6	1.5860	0.7713	1266.0	1394.4	1.5822				
900	0.8762	1311.2	1453.1	1.6299	0.8504	1310.5	1452.2	1.6263				
1000	0.9538	1354.8	1509.2	1.6697	0.9262	1354.2	1508.5	1.6662				
1100	1.0290	1398.4	1565.1	1.7067	0.9998	1397.9	1564.4	1.7033				
1200	1.1030	1442.5	1621.1	1.7416	1.0720	1442.0	1620.6	1.7382				
$P = 925$ psia, $T^{\text{sat}} = 535.21$ °F												
Sat liq.	0.0213	527.1	530.8	0.7319	0.0214	531.0	534.7	0.7358				
Sat vap	0.4861	1112.4	1195.6	1.4001	0.4721	1111.7	1194.7	1.3970				
540	0.4930	1116.5	1200.9	1.4054	0.4744	1113.2	1196.6	1.3988				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
560	0.5200	1132.7	1221.7	1.4260	0.5014	1129.9	1218.0	1.4201				
580	0.5445	1147.3	1240.5	1.4443	0.5259	1144.9	1237.4	1.4389				
600	0.5672	1160.8	1257.8	1.4608	0.5485	1158.6	1255.1	1.4557				
620	0.5885	1173.2	1274.0	1.4759	0.5696	1171.4	1271.5	1.4711				
650	0.6186	1190.7	1296.6	1.4965	0.5993	1189.1	1294.4	1.4921				
700	0.6648	1217.2	1331.0	1.5269	0.6449	1216.0	1329.3	1.5228				
750	0.7078	1241.8	1362.9	1.5539	0.6871	1240.7	1361.5	1.5500				
800	0.7486	1265.1	1393.2	1.5784	0.7272	1264.2	1392.0	1.5748				
900	0.8261	1309.8	1451.2	1.6227	0.8030	1309.1	1450.3	1.6193				
1000	0.9001	1353.6	1507.7	1.6628	0.8753	1353.1	1507.0	1.6595				
1100	0.9719	1397.4	1563.8	1.7000	0.9455	1397.0	1563.2	1.6967				
1200	1.0420	1441.6	1620.0	1.7349	1.0140	1441.2	1619.5	1.7317				
	$P = 975$ psia, $T^{\text{sat}} = 541.52$ °F											
Sat liq.	0.0215	534.8	538.7	0.7396	0.0216	538.6	542.6	0.7434	$P = 1000$ psia, $T^{\text{sat}} = 544.58$ °F			
Sat vap	0.4587	1111.1	1193.8	1.3940	0.4460	1110.4	1192.9	1.3910				
560	0.4837	1127.0	1214.3	1.4142	0.4668	1124.0	1210.4	1.4082				
580	0.5082	1142.4	1234.1	1.4335	0.4913	1139.9	1230.8	1.4281				
600	0.5307	1156.5	1252.2	1.4507	0.5137	1154.3	1249.3	1.4457				
620	0.5517	1169.5	1269.0	1.4664	0.5346	1167.5	1266.5	1.4617				
650	0.5810	1187.5	1292.3	1.4877	0.5636	1185.8	1290.1	1.4833				
700	0.6259	1214.7	1327.6	1.5188	0.6080	1213.4	1325.9	1.5149				
750	0.6675	1239.7	1360.1	1.5463	0.6489	1238.6	1358.7	1.5426				
800	0.7068	1263.3	1390.8	1.5712	0.6875	1262.4	1389.6	1.5677				
900	0.7811	1308.5	1449.4	1.6159	0.7603	1307.8	1448.5	1.6126				

(continued)

Table F.2 (continued)

T °F	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R	V ft ³ /lb.	U Btu/lb	H Btu/lb	S Btu/lb R
1000	0.8518	1352.5	1506.2	1.6562	0.8295	1351.9	1505.4	1.6530				
1100	0.9204	1396.5	1562.5	1.6936	0.8966	1396.0	1561.9	1.6905				
1200	0.9875	1440.8	1619.0	1.7286	0.9621	1440.4	1618.4	1.7256				
$P = 1025$ psia, $T^{\text{sat}} = 547.58$ °F												
Sat liq.	0.0217	542.3	546.4	0.7471	0.0218	545.9	550.1	0.7507				
Sat vap	0.4338	1109.7	1192.0	1.3880	0.4222	1109.0	1191.0	1.3851				
560	0.4506	1120.9	1206.4	1.4022	0.4350	1117.8	1202.3	1.3962				
580	0.4752	1137.3	1227.4	1.4227	0.4597	1134.7	1224.0	1.4173				
600	0.4975	1152.0	1246.4	1.4407	0.4821	1149.8	1234.4	1.4358				
620	0.5183	1165.6	1263.9	1.4571	0.5027	1163.6	1261.2	1.4524				
650	0.5471	1184.2	1287.9	1.4791	0.5312	1182.5	1285.7	1.4748				
700	0.5908	1212.1	1324.2	1.5110	0.5745	1210.8	1322.4	1.5072				
750	0.6311	1237.5	1357.3	1.5389	0.6142	1236.5	1355.8	1.5354				
800	0.6690	1261.5	1388.4	1.5642	0.6515	1260.6	1387.2	1.5608				
900	0.7405	1307.1	1447.5	1.6094	0.7216	1306.4	1446.6	1.6062				
1000	0.8083	1351.4	1504.7	1.6499	0.7881	1350.8	1503.9	1.6469				
1100	0.8739	1395.5	1561.3	1.6874	0.8524	1395.0	1560.7	1.6845				
1200	0.9380	1440.0	1617.9	1.7226	0.9151	1439.6	1617.4	1.7197				
$P = 1075$ psia, $T^{\text{sat}} = 553.43$ °F												
Sat liq.	0.0219	549.5	553.9	0.7543	0.0220	553.1	557.5	0.7578				
Sat vap	0.4112	1108.3	1190.1	1.3822	0.4006	1107.5	1189.1	1.3794				
560	0.4200	1114.5	1198.1	1.3901	0.4056	1111.2	1193.7	1.3840				
580	0.4449	1131.9	1220.4	1.4118	0.4307	1129.1	1216.8	1.4064				
600	0.4673	1147.4	1240.4	1.4308	0.4531	1145.1	1237.3	1.4259				

(continued)

Table F.3 Saturated steam tables in SI units

T K	P ^{sat} kPa	Spec. vol. V cm ³ /g		Int. energy kJ/kg		Enthalpy H kJ/kg		Entropy S kJ/kg K	
		V _l	V _g	U _l	U _g	H _l	H _g	V _l	V _g
273.15	0.611	1.000	206300	-0.04	2375.6	-0.04	2501.6	0.0000	9.1578
273.16	0.611	1.000	206200	0.00	2375.6	0.00	2501.6	0.0000	9.1575
274.15	0.657	1.000	192600	4.17	2376.9	4.17	2503.4	0.0153	9.1311
275.15	0.705	1.000	179900	8.39	2378.3	8.39	2505.2	0.0306	9.1047
276.15	0.757	1.000	168200	12.60	2379.7	12.60	2507.1	0.0459	9.0785
277.15	0.813	1.000	157300	16.80	2381.1	16.80	2508.9	0.0611	9.0526
278.15	0.872	1.000	147200	21.01	2382.4	21.01	2510.7	0.0762	9.0269
279.15	0.935	1.000	137800	25.21	2383.8	25.21	2512.6	0.0913	9.0014
280.15	1.001	1.000	129100	29.41	2385.2	29.41	2514.4	0.1063	8.9762
281.15	1.072	1.000	121000	33.60	2386.6	33.60	2516.2	0.1213	8.9513
282.15	1.147	1.000	113400	37.80	2387.9	37.80	2518.1	0.1362	8.9265
283.15	1.227	1.000	106400	41.99	2389.3	41.99	2519.9	0.1510	8.9020
284.15	1.312	1.000	99910	46.18	2390.7	46.19	2521.7	0.1658	8.8776
285.15	1.401	1.000	93840	50.38	2392.1	50.38	2523.6	0.1805	8.8536
286.15	1.497	1.001	88180	54.56	2393.4	54.57	2525.4	0.1952	8.8297
287.15	1.597	1.001	82900	58.75	2394.8	58.75	2527.2	0.2098	8.8060
288.15	1.704	1.001	77980	62.94	2396.2	62.94	2529.1	0.2243	8.7826
289.15	1.817	1.001	73380	67.12	2397.6	67.13	2530.9	0.2388	8.7593
290.15	1.936	1.001	69090	71.31	2398.9	71.31	2532.7	0.2533	8.7363
291.15	2.062	1.001	65090	75.49	2400.3	75.50	2534.5	0.2677	8.7135
292.15	2.196	1.002	61340	79.68	2401.7	79.68	2536.4	0.2820	8.6908
293.15	2.337	1.002	57840	83.86	2403.0	83.86	2538.2	0.2963	8.6684
294.15	2.485	1.002	54560	88.04	2404.4	88.04	2540.0	0.3105	8.6462
295.15	2.642	1.002	51490	92.22	2405.8	92.23	2541.8	0.3247	8.6241
296.15	2.808	1.002	48620	96.40	2407.1	96.41	2543.6	0.3389	8.6023
297.15	2.982	1.003	45930	100.60	2408.5	100.60	2545.5	0.3530	8.5806
298.15	3.166	1.003	43400	104.80	2409.9	104.80	2547.3	0.3670	8.5592
299.15	3.360	1.003	41030	108.90	2411.2	108.90	2549.1	0.3810	8.5379
300.15	3.564	1.003	38810	113.10	2412.6	113.10	2550.9	0.3949	8.5168
301.15	3.778	1.004	36730	117.30	2414.0	117.30	2552.7	0.4088	8.4959
302.15	4.004	1.004	34770	121.50	2415.3	121.50	2554.5	0.4227	8.4751
303.15	4.241	1.004	32930	125.70	2416.7	125.70	2556.4	0.4365	8.4546
304.15	4.491	1.005	31200	129.80	2418.0	129.80	2558.2	0.4503	8.4342
305.15	4.753	1.005	29570	134.00	2419.4	134.00	2560.0	0.4640	8.4140
306.15	5.029	1.005	28040	138.20	2420.8	138.20	2561.8	0.4777	8.3939
307.15	5.318	1.006	26600	142.40	2422.1	142.40	2563.6	0.4913	8.3740
308.15	5.622	1.006	25240	146.60	2423.5	146.60	2565.4	0.5049	8.3543
309.15	5.940	1.006	23970	150.70	2424.8	150.70	2567.2	0.5184	8.3348
310.15	6.274	1.007	22760	154.90	2426.2	154.90	2569.0	0.5319	8.3154
311.15	6.624	1.007	21630	159.10	2427.5	159.10	2570.8	0.5453	8.2962
312.15	6.991	1.007	20560	163.30	2428.9	163.30	2572.6	0.5588	8.2772
313.15	7.375	1.008	19550	167.40	2430.2	167.50	2574.4	0.5721	8.2583
314.15	7.777	1.008	18590	171.60	2431.6	171.60	2576.2	0.5854	8.2395

(continued)

Table F.3 (continued)

T K	P^{sat} kPa	Spec. vol. V cm ³ /g		Int. energy kJ/kg		Enthalpy H kJ/kg		Entropy S kJ/kg K	
		V_l	V_g	U_l	U_g	H_l	H_g	V_l	V_g
315.15	8.198	1.009	17690	175.80	2432.9	175.80	2577.9	0.5987	8.2209
316.15	8.639	1.009	16840	180.00	2434.2	180.00	2579.7	0.6120	8.2025
317.15	9.100	1.009	16040	184.20	2435.6	184.20	2581.5	0.6252	8.1842
318.15	9.582	1.010	15280	188.30	2436.9	188.40	2583.3	0.6383	8.1661
319.15	10.090	1.010	14560	192.50	2438.3	192.50	2585.1	0.6514	8.1481
320.15	10.610	1.011	13880	196.70	2439.6	196.70	2586.9	0.6645	8.1302
321.15	11.160	1.011	13230	200.90	2440.9	200.90	2588.6	0.6776	8.1125
322.15	11.74	1.012	12620	205.1	2442.3	205.1	2590.4	0.6906	8.0950
323.15	12.34	1.012	12050	209.2	2443.6	209.3	2592.2	0.7035	8.0776
324.15	12.96	1.013	11500	213.4	2444.9	213.4	2593.9	0.7164	8.0603
325.15	13.61	1.013	10980	217.6	2446.2	217.6	2595.7	0.7293	8.0432
326.15	14.29	1.014	10490	221.8	2447.6	221.8	2597.5	0.7422	8.0262
327.15	15.00	1.014	10020	226.0	2448.9	226.0	2599.2	0.7550	8.0093
328.15	15.74	1.015	9578.9	230.2	2450.2	230.2	2601.0	0.7677	7.9925
329.15	16.51	1.015	9158.7	234.3	2451.5	234.4	2602.7	0.7804	7.9759
330.15	17.31	1.016	8759.8	238.5	2452.8	238.5	2604.5	0.7931	7.9595
331.15	18.15	1.016	8380.8	242.7	2454.1	242.7	2606.2	0.8058	7.9431
332.15	19.02	1.017	8020.8	246.9	2455.4	246.9	2608.0	0.8184	7.9269
333.15	19.92	1.017	7678.5	251.1	2456.8	251.1	2609.7	0.8310	7.9108
334.15	20.86	1.018	7353.2	255.3	2458.1	255.3	2611.4	0.8435	7.8948
335.15	21.84	1.018	7043.7	259.4	2459.4	259.5	2613.2	0.8560	7.8790
336.15	22.86	1.019	6749.3	263.6	2460.7	263.6	2614.9	0.8685	7.8633
337.15	23.91	1.019	6469.0	267.8	2462.0	267.8	2616.6	0.8809	7.8477
338.15	25.01	1.020	6202.3	272.0	2463.2	272.0	2618.4	0.8933	7.8322
339.15	26.15	1.020	5948.2	276.2	2464.5	276.2	2620.1	0.9057	7.8168
340.15	27.33	1.021	5706.2	280.4	2465.8	280.4	2621.8	0.9180	7.8015
341.15	28.56	1.022	5475.6	284.6	2467.1	284.6	2623.5	0.9303	7.7864
342.15	29.84	1.022	5255.8	288.8	2468.4	288.8	2625.2	0.9426	7.7714
343.15	31.16	1.023	5046.3	292.9	2469.7	293.0	2626.9	0.9548	7.7565
344.15	32.53	1.023	4846.4	297.1	2470.9	297.2	2628.6	0.9670	7.7417
345.15	33.96	1.024	4655.7	301.3	2472.2	301.4	2630.3	0.9792	7.7270
346.15	35.43	1.025	4473.7	305.5	2473.5	305.5	2632.0	0.9913	7.7124
347.15	36.96	1.025	4300.0	309.7	2474.8	309.7	2633.7	1.0034	7.6979
348.15	38.55	1.026	4134.1	313.9	2476.0	313.9	2635.4	1.0154	7.6835
349.15	40.19	1.027	3975.7	318.1	2477.3	318.1	2637.1	1.0275	7.6693
350.15	41.89	1.027	3824.3	322.3	2478.5	322.3	2638.7	1.0395	7.6551
351.15	43.65	1.028	3679.6	326.5	2479.8	326.5	2640.4	1.0514	7.6410
352.15	45.47	1.029	3541.3	330.7	2481.1	330.7	2642.1	1.0634	7.6271
353.15	47.36	1.029	3409.1	334.9	2482.3	334.9	2643.8	1.0753	7.6132
354.15	49.31	1.030	3282.6	339.1	2483.5	339.1	2645.4	1.0871	7.5995
355.15	51.33	1.031	3161.6	343.3	2484.8	343.3	2647.1	1.0990	7.5858
356.15	53.42	1.031	3045.8	347.5	2486.0	347.5	2648.7	1.1108	7.5722
357.15	55.57	1.032	2935.0	351.7	2487.3	351.7	2650.4	1.1225	7.5587

(continued)

Table F.3 (continued)

T K	P^{sat} kPa	Spec. vol. V cm ³ /g		Int. energy kJ/kg		Enthalpy H kJ/kg		Entropy S kJ/kg K	
		V_l	V_g	U_l	U_g	H_l	H_g	V_l	V_g
358.15	57.80	1.033	2828.8	355.9	2488.5	355.9	2652.0	1.1343	7.5454
359.15	60.11	1.033	2727.2	360.1	2489.7	360.1	2653.6	1.1460	7.5321
360.15	62.49	1.034	2629.8	364.3	2490.9	364.3	2655.3	1.1577	7.5189
361.15	64.95	1.035	2536.5	368.5	2492.2	368.5	2656.9	1.1693	7.5058
362.15	67.49	1.035	2447.0	372.7	2493.4	372.7	2658.5	1.1809	7.4928
363.15	70.11	1.036	2361.3	376.9	2494.6	376.9	2660.1	1.1925	7.4799
364.15	72.81	1.037	2279.1	381.1	2495.8	381.1	2661.7	1.2041	7.4670
365.15	75.61	1.038	2200.2	385.3	2497.0	385.4	2663.4	1.2156	7.4543
366.15	78.49	1.038	2124.5	389.5	2498.2	389.6	2665.0	1.2271	7.4416
367.15	81.46	1.039	2051.9	393.7	2499.4	393.8	2666.6	1.2386	7.4291
368.15	84.53	1.040	1982.2	397.9	2500.6	398.0	2668.1	1.2501	7.4166
369.15	87.69	1.041	1915.3	402.1	2501.8	402.2	2669.7	1.2615	7.4042
370.15	90.94	1.041	1851.0	406.3	2503.0	406.4	2671.3	1.2729	7.3919
371.15	94.30	1.042	1789.3	410.5	2504.1	410.6	2672.9	1.2842	7.3796

Table F.4 Superheated steam tables in SI units

T °C	$P = 1$ kPa, $T^{\text{sat}} = 6.98$ °C		$P = 10$ kPa, $T^{\text{sat}} = 45.83$ °C		$P = 30$ kPa, $T^{\text{sat}} = 69.12$ °C			
	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
Sat liq	1.000	29.334	29.335	0.1060	1.010	191.8	191.8	0.6493
Sat vap	129200	2385.2	2514.4	8.9767	14670	2438.0	2584.8	8.1511
75	160640	2480.8	2641.5	9.3828	16030	2479.7	2640.0	8.3168
100	172180	2516.4	2688.6	9.5136	17190	2515.6	2687.5	8.4486
125	183720	2552.3	2736.0	9.6365	18350	2551.6	2735.2	8.5722
150	195270	2588.5	2783.7	9.7527	19510	2588.0	2783.1	8.6888
175	206810	2624.9	2831.7	9.8629	20660	2624.5	2831.2	8.7994
200	218350	2661.7	2880.1	9.9679	21820	2661.4	2879.6	8.9045
225	229890	2698.8	2928.7	10.0681	22980	2698.6	2928.4	9.0049
250	241430	2736.3	2977.7	10.1641	24130	2736.1	2977.4	9.1010
300	264500	2812.3	3076.8	10.3450	26440	2812.2	3076.6	9.2820
350	287580	2889.9	3177.5	10.5133	28750	2889.8	3177.3	9.4504
400	310660	2969.1	3279.7	10.6711	31060	2969.0	3279.6	9.6083
450	333730	3049.9	3383.6	10.8200	33370	3049.8	3383.5	9.7572
500	356810	3132.4	3489.2	10.9612	35670	3132.3	3489.1	9.8984
550	379880	3216.7	3596.5	11.0957	37980	3216.6	3596.5	10.0329
Sat liq	1.017	251.4	251.5	0.8321	1.022	289.3	289.3	0.9441
Sat vap	7649.8	2456.9	2609.9	7.9094	5229.3	2468.6	2625.4	7.7695
75	8000.0	2478.4	2638.4	7.9933	5322.0	2477.1	2636.8	7.8024
100	8584.7	2514.6	2686.3	8.1261	5714.4	2513.6	2685.1	7.9363
125	9167.1	2550.9	2734.2	8.2504	6104.6	2550.2	2733.3	8.0614
150	9748.0	2587.4	2782.3	8.3676	6493.2	2586.8	2781.6	8.1791

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
175	10320.0	2624.1	2830.6	8.4785	6880.8	2623.6	2830.0	8.2903
200	10900.0	2661.0	2879.2	8.5839	7267.5	2660.7	2878.7	8.3960
225	11480.0	2698.3	2928.0	8.6844	7653.8	2698.0	2927.6	8.4967
250	12060.0	2735.8	2977.1	8.7806	8039.7	2735.6	2976.8	8.5930
300	13210.0	2812.0	3076.4	8.9618	8810.8	2811.8	3076.1	8.7744
350	14370.0	2889.6	3177.1	9.1303	9581.2	2889.5	3176.9	8.9430
400	15520.0	2968.9	3279.4	9.2882	10350.0	2968.7	3279.3	9.1010
450	16680.0	3049.7	3383.4	9.4372	11120.0	3049.6	3383.3	9.2499
500	17830.0	3132.3	3489.0	9.5784	11890.0	3132.2	3488.9	9.3912
550	18990.0	3216.5	3596.4	9.7130	12660.0	3216.5	3596.3	9.5257
	$P = 40$ kPa, $T^{\text{sat}} = 75.89$ °C							
Sat liq	1.027	317.6	317.7	1.0261	1.030	340.5	340.6	1.0912
Sat vap	3993.4	2477.1	2636.9	7.6709	3240.2	2484.0	2646.0	7.5947
100	4279.2	2512.6	2683.8	7.8009	3418.1	2511.7	2682.6	7.6953
125	4573.3	2549.4	2732.3	7.9268	3654.5	2548.6	2731.4	7.8219
150	4865.8	2586.2	2780.9	8.0450	3889.3	2585.6	2780.1	7.9406
175	5157.2	2623.2	2829.5	8.1566	4123.0	2622.7	2828.9	8.0526
200	5447.8	2660.3	2878.2	8.2624	4356.0	2659.9	2877.7	8.1587
225	5738.0	2697.7	2827.2	8.3633	4588.5	2697.4	2926.8	8.2598
250	6027.7	2735.4	2976.5	8.4598	4820.5	2735.1	2976.1	8.3564
300	6606.5	2811.6	3075.9	8.6413	5283.9	2811.5	3075.7	8.5380
350	7184.6	2889.4	3176.8	8.8100	5746.7	2889.2	3176.6	8.7068
400	7762.5	2968.6	3279.1	8.9680	6209.1	2968.5	3279.0	8.8649
450	8430.1	3049.5	3383.1	9.1170	6671.4	3049.4	3383.0	9.0139

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
500	8917.6	3132.1	3488.8	9.2583	7133.5	3132.0	3488.7	9.1552
550	9494.9	3216.4	3596.2	9.3929	7595.5	3216.3	3596.1	9.2898
	$P = 75$ kPa, $T^{\text{sat}} = 91.79$ °C							
Sat liq	1.037	384.4	384.5	1.2131	1.043	417.4	417.5	1.3027
Sat vap	2216.9	2496.7	2663.0	7.4570	1693.7	2506.1	2675.4	7.3598
100	2269.8	2509.2	2679.4	7.5014	1695.5	2506.6	2676.2	7.3618
125	2429.4	2546.7	2728.9	7.6300	1816.7	2544.8	2726.5	7.4923
150	2587.3	2584.2	2778.2	7.7500	1936.3	2582.7	2776.3	7.6137
175	2744.2	2621.6	2827.4	7.8629	2054.7	2620.4	2825.9	7.7275
200	2900.2	2659.0	2876.6	7.9697	2172.3	2658.1	2875.4	7.8349
225	3055.8	2696.7	2925.8	8.0712	2289.4	2695.9	2924.9	7.9369
250	3210.9	2734.5	2975.3	8.1681	2406.1	2733.9	2974.5	8.0342
300	3520.5	2811.0	3075.1	8.3502	2638.7	2810.6	3074.5	8.2166
350	3829.4	2888.9	3176.1	8.5191	2870.8	2888.6	3175.6	8.3858
400	4138.0	2968.2	3278.6	8.6773	3102.5	2968.0	3278.2	8.5442
450	4446.4	3049.2	3382.7	8.8265	3334.0	3049.0	3382.4	8.6934
500	4754.7	3131.8	3488.4	8.9678	3565.3	3131.6	3488.1	8.8348
550	5062.8	3216.1	3595.8	9.1025	3796.5	3216.0	3595.6	8.9695
600	5370.9	3302.2	3705.0	9.2312	4027.7	3302.0	3704.8	9.0982
	$P = 101.325$ kPa, $T^{\text{sat}} = 100.00$ °C							
Sat liq	1.044	419.0	419.1	1.3069	1.049	444.2	444.4	1.3740
Sat vap	1673.0	2506.5	2676.0	7.3554	1374.6	2513.4	2685.2	7.2847
125	1792.7	2544.7	2726.4	7.4860	1449.1	2542.9	2724.0	7.3844
150	1910.7	2582.6	2776.2	7.6075	1545.6	2581.2	2774.4	7.5072

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
175	2027.7	2620.4	2825.8	7.7213	1641.0	2619.3	2824.4	7.6219
200	2143.8	2658.1	2875.3	7.8288	1735.6	2657.2	2874.2	7.7300
225	2259.3	2695.9	2924.8	7.9308	1829.6	2695.2	2923.9	7.8324
250	2374.5	2733.9	2974.5	8.0280	1923.2	2733.3	2973.7	7.9300
300	2604.2	2810.6	3074.4	8.2105	2109.7	2810.2	3073.9	8.1129
350	2833.2	2888.5	3175.6	8.3797	2295.6	2888.2	3175.2	8.2823
400	3061.9	2968.0	3278.2	8.5381	2481.2	2967.7	3277.8	8.4408
450	3290.3	3048.9	3382.3	8.6873	2666.5	3048.7	3382.0	8.5901
500	3518.7	3131.6	3488.1	8.8287	2851.7	3131.4	3487.9	8.7316
550	3746.9	3215.9	3595.6	8.9634	3036.8	3215.8	3595.4	8.8663
600	3975.0	3302.0	3704.8	9.0922	3221.8	3301.9	3704.6	8.9951
	$P = 150\text{kPa}, T^{\text{sat}} = 111.37\text{ °C}$				$P = 175\text{ kPa}, T^{\text{sat}} = 116.06\text{ °C}$			
Sat liq	1.053	467.0	467.1	1.4336	1.057	486.8	487.0	1.4849
Sat vap	1159.0	2519.5	2693.4	7.2234	1003.3	2524.7	2700.3	7.1716
125	1204.0	2540.9	2721.5	7.2953	1028.8	2538.9	2719.0	7.2191
150	1285.2	2579.7	2772.5	7.4194	1099.1	2578.2	2770.5	7.3447
175	1365.2	2618.1	2822.9	7.5352	1168.2	2616.9	2821.3	7.4614
200	1444.4	2656.3	2872.9	7.6439	1236.4	2655.3	2871.7	7.5708
225	1523.0	2694.4	2922.9	7.7458	1304.1	2693.7	2921.9	7.6741
250	1601.3	2732.7	2972.9	7.8447	1371.3	2732.1	2972.0	7.7724
300	1757.0	2809.7	3073.3	8.0280	1505.1	2809.3	3072.7	7.9561
350	1912.2	2887.9	3174.7	8.1976	1638.3	2887.5	3174.2	8.1259
400	2066.9	2967.4	3277.5	8.3562	1771.1	2967.1	3277.1	8.2847
450	2221.5	3048.5	3381.7	8.5056	1903.7	3048.3	3381.4	8.4341

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
500	2375.9	3131.2	3487.6	8.6472	2036.1	3131.0	3487.3	8.5758
550	2530.2	3215.6	3595.1	8.7819	2168.4	3215.4	3594.9	8.7106
600	2684.5	3301.7	3704.4	8.9108	2300.7	3301.6	3704.2	8.8394
$P = 200$ kPa, $T^{\text{sat}} = 120.23$ °C								
Sat liq	1.061	504.5	504.7	1.5301	1.064	520.5	520.7	1.5705
Sat vap	885.4	2529.2	2706.3	7.1268	792.97	2533.2	2711.6	7.0873
125	897.5	2536.9	2716.4	7.1523	795.25	2534.8	2713.8	7.0928
150	959.5	2576.6	2768.5	7.2794	850.97	2575.1	2766.5	7.2213
175	1020.4	2615.7	2819.8	7.3971	905.44	2614.5	2818.2	7.3400
200	1080.4	2654.4	2870.5	7.5072	959.06	2653.5	2869.3	7.4508
225	1139.8	2692.9	2920.9	7.6110	1012.10	2692.2	2919.9	7.5551
250	1198.9	2731.4	2971.2	7.7096	1064.70	2730.8	2970.4	7.6540
300	1316.2	2808.8	3072.1	7.8937	1169.20	2808.4	3071.5	7.8385
350	1432.8	2887.2	3173.8	8.0638	1273.10	2886.9	3173.3	8.0088
400	1549.2	2966.9	3276.7	8.2226	1376.60	2966.6	3276.3	8.1679
450	1665.3	3048.0	3381.1	8.3722	1479.90	3047.8	3380.8	8.3175
500	1781.2	3130.8	3487.0	8.5139	1583.00	3130.6	3486.8	8.4593
550	1897.1	3215.3	3594.7	8.6487	1686.00	3215.1	3594.4	8.5942
600	2012.9	3301.4	3704.0	8.7776	1789.00	3301.2	3703.8	8.7231
650	2128.6	3389.2	3815.0	8.9012	1891.90	3389.1	3814.8	8.8467
$P = 250$ kPa, $T^{\text{sat}} = 127.43$ °C								
Sat liq	1.068	535.1	535.34	1.6071	1.071	548.6	548.9	1.6407
Sat vap	718.4	2536.8	2716.4	7.0520	657.04	2540.0	2720.7	7.0201
150	764.1	2573.5	2764.5	7.1689	693.00	2571.9	2762.5	7.1211

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
175	813.5	2613.3	2816.7	7.2886	738.21	2612.1	2815.1	7.2419
200	862.0	2652.5	2868.0	7.4001	782.55	2651.6	2866.8	7.3541
225	910.0	2691.4	2918.9	7.5050	826.29	2690.7	2917.9	7.4594
250	957.4	2730.2	2969.6	7.6042	869.61	2729.6	2968.7	7.5590
300	1051.6	2808.0	3070.9	7.7891	955.45	2807.5	3070.3	7.7444
350	1145.2	2886.5	3172.8	7.9597	1040.70	2886.2	3172.4	7.9151
400	1238.5	2966.3	3275.9	8.1188	1125.50	2966.0	3275.5	8.0744
450	1331.5	3047.6	3380.4	8.2686	1210.20	3047.3	3380.1	8.2243
500	1424.4	3130.4	3486.5	8.4104	1294.70	3130.2	3486.2	8.3661
550	1517.2	3214.9	3594.2	8.5453	1379.00	3214.7	3594.0	8.5011
600	1609.9	3301.1	3703.6	8.6743	1463.30	3300.9	3703.4	8.6301
650	1702.5	3389.0	3814.6	8.7980	1547.60	3388.8	3814.4	8.7538
	$P = 300$ kPa, $T^{\text{sat}} = 133.54$ °C				$P = 325$ kPa, $T^{\text{sat}} = 136.29$ °C			
Sat liq	1.073	561.1	561.4	1.6716	1.076	572.8	573.2	1.7004
Sat vap	605.6	2543.0	2724.7	6.9909	561.75	2545.7	2728.3	6.9640
150	633.7	2570.3	2760.4	7.0771	583.58	2568.7	2758.4	7.0363
175	675.5	2610.8	2813.5	7.1990	622.41	2609.6	2811.9	7.1592
200	716.4	2650.6	2865.5	7.3119	660.33	2649.6	2864.2	7.2729
225	756.6	2689.9	2916.9	7.4177	690.22	2681.2	2905.6	7.3585
250	796.4	2729.0	2967.9	7.5176	719.81	2712.7	2946.6	7.4400
300	875.3	2807.1	3069.7	7.7034	749.18	2744.0	2987.5	7.5181
350	953.5	2885.8	3171.9	7.8744	778.39	2775.3	3028.2	7.5933
400	1031.4	2965.8	3275.2	8.0338	807.47	2806.6	3069.0	7.6657
450	1109.0	3047.1	3379.8	8.1838	843.68	2845.9	3120.1	7.7530

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
500	1186.5	3130.0	3486.0	8.3257	879.78	2885.5	3171.4	7.8369
550	1263.9	3214.5	3593.7	8.4608	951.73	2965.5	3274.8	7.9965
600	1341.2	3300.8	3703.2	8.5898	1023.50	3046.9	3379.5	8.1465
650	1418.5	3388.7	3814.2	8.7135	1095.00	3129.8	3485.7	8.2885
$P = 350$ kPa, $T^{\text{sat}} = 138.87$ °C								
Sat liq	1.079	583.9	584.3	1.7273	1.081	594.3	594.7	1.7526
Sat vap	524.00	2548.2	2731.6	6.9392	491.13	2550.6	2734.7	6.9160
150	540.58	2567.1	2756.3	6.9982	503.29	2565.4	2754.1	6.9624
175	576.90	2608.3	2810.3	7.1222	537.46	2607.1	2808.6	7.0875
200	612.31	2648.6	2863.0	7.2366	570.69	2647.7	2861.7	7.2027
220	640.18	2680.4	2904.5	7.3226	596.81	2679.6	2903.4	7.2891
240	667.75	2712.0	2945.7	7.4045	622.62	2711.3	2944.8	7.3713
260	695.09	2743.4	2986.7	7.4828	648.22	2742.8	2985.9	7.4499
280	722.27	2774.8	3027.6	7.5581	673.64	2774.3	3026.9	7.5254
300	749.33	2806.2	3068.4	7.6307	698.94	2805.7	3067.8	7.5981
325	783.01	2845.6	3119.6	7.7181	730.42	2845.2	3119.1	7.6856
350	816.57	2885.1	3170.9	7.8022	761.79	2884.8	3170.5	7.7698
400	883.45	2965.2	3274.4	7.9619	824.28	2964.9	3274.0	7.9296
450	950.11	3046.6	3379.2	8.1120	886.54	3046.4	3378.8	8.0798
500	1016.60	3129.6	3485.4	8.2540	948.66	3129.4	3485.1	8.2219
550	1083.00	3214.2	3593.3	8.3892	1010.70	3214.0	3593.0	8.3571
$P = 400$ kPa, $T^{\text{sat}} = 143.62$ °C								
Sat liq	1.084	604.2	604.7	1.7764				
Sat vap	462.22	2552.7	2737.6	6.8943				

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
150	470.66	2563.7	2752.0	6.9285				
175	502.93	2605.8	2807.0	7.0548				
200	534.26	2646.7	2860.4	7.1708				
220	558.85	2678.8	2902.3	7.2576				
240	583.14	2710.6	2943.9	7.3402				
260	607.20	2742.2	2985.1	7.4190				
280	631.09	2773.7	3026.2	7.4947				
300	654.85	2805.3	3067.2	7.5675				
325	684.41	2844.8	3118.5	7.6552				
350	713.85	2884.5	3170.0	7.7395				
400	772.50	2964.6	3273.6	7.8994				
450	830.92	3046.2	3378.5	8.0497				
500	889.19	3129.2	3484.9	8.1919				
550	947.35	3213.8	3592.8	8.3271				
	$P = 425$ kPa, $T^{\text{sat}} = 145.82$ °C				$P = 450$ kPa, $T^{\text{sat}} = 147.92$ °C			
Sat liq	1.086	613.7	614.1	1.7990	1.088	622.7	623.2	1.8204
Sat vap	436.61	2554.8	2740.3	6.8739	413.75	2556.7	2742.9	6.8547
150	441.85	2562.0	2749.8	6.8965	416.24	2560.3	2747.7	6.8660
175	472.47	2604.5	2805.3	7.0239	445.38	2603.2	2803.7	6.9946
200	502.12	2645.7	2859.1	7.1407	473.55	2644.7	2857.8	7.1121
220	525.36	2678.0	2901.2	7.2280	495.59	2677.1	2900.2	7.1999
240	548.30	2709.9	2942.9	7.3108	517.33	2709.2	2942.0	7.2831
260	571.01	2741.6	2984.3	7.3899	538.83	2741.0	2983.5	7.3624
280	593.54	2773.2	3025.5	7.4657	560.17	2772.7	3024.8	7.4384

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
300	615.95	2804.8	3066.6	7.5388	581.37	2804.4	3066.0	7.5116
325	643.81	2844.4	3118.0	7.6265	607.73	2844.0	3117.5	7.5995
350	671.56	2884.1	3169.5	7.7109	633.97	2883.8	3169.1	7.6840
400	726.81	2964.4	3273.3	7.8710	686.20	2964.1	3272.9	7.8442
450	781.84	3045.9	3378.2	8.0214	738.21	3045.7	3377.9	7.9947
500	836.72	3129.0	3484.6	8.1636	790.07	3128.8	3484.3	8.1370
550	891.49	3213.7	3592.5	8.2989	841.83	3213.5	3592.3	8.2723
$P = 475 \text{ kPa}, T^{\text{sat}} = 149.92 \text{ }^\circ\text{C}$								
Sat liq	1.091	631.3	631.8	1.8408	1.093	639.6	640.1	1.8604
Sat vap	393.22	2558.5	2745.3	6.8365	374.68	2560.2	2747.5	6.8192
175	421.14	2601.9	2802.0	6.9667	399.31	2600.6	2800.3	6.9400
200	447.97	2643.7	2856.5	7.0850	424.96	2642.7	2855.1	7.0592
220	468.95	2676.3	2899.1	7.1732	444.97	2675.5	2896.0	7.1478
240	489.62	2708.5	2941.1	7.2567	464.67	2707.8	2940.1	7.2317
260	510.05	2740.4	2982.7	7.3363	484.14	2739.8	2981.9	7.3115
280	530.30	2772.2	3024.1	7.4125	503.43	2771.7	3023.4	7.3879
300	550.43	2803.9	3065.4	7.4858	522.58	2803.5	3064.8	7.4614
325	575.44	2843.6	3116.9	7.5739	546.38	2843.2	3116.4	7.5496
350	600.33	2883.4	3168.6	7.6585	570.05	2883.1	3168.1	7.6343
400	649.87	2963.8	3272.5	7.8189	617.16	2963.5	3272.1	7.7948
450	699.18	3045.4	3377.6	7.9694	664.05	3045.2	3377.2	7.9454
500	748.34	3128.6	3484.0	8.1118	710.78	3128.4	3483.8	8.0879
550	797.40	3213.3	3592.1	8.2472	757.41	3213.1	3591.8	8.2233
600	846.37	3299.7	3701.7	8.3765	803.95	3299.5	3701.5	8.3526

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
650	895.27	3387.7	3813.0	8.5004	850.42	3387.6	3812.8	8.4766
Sat liq	1.095	647.5	648.1	1.8790	1.097	655.2	655.8	1.8970
Sat vap	357.84	2561.8	2749.7	6.8027	342.48	2563.3	2751.7	6.7870
175	379.56	2599.3	2798.6	6.9145	361.60	2598.0	2796.8	6.8900
200	404.13	2641.6	2853.8	7.0345	385.19	2640.6	2852.5	7.0108
220	423.28	2674.6	2896.8	7.1236	403.55	2673.8	2895.7	7.1004
240	442.11	2707.1	2939.2	7.2078	421.59	2706.4	2938.3	7.1849
260	460.70	2739.2	2981.1	7.2879	439.38	2738.6	2980.3	7.2653
280	479.11	2771.2	3022.7	7.3645	457.00	2770.6	3022.0	7.3421
300	497.38	2803.0	3064.1	7.4381	474.48	2802.6	3063.5	7.4158
325	520.08	2842.8	3115.9	7.5264	496.18	2842.4	3115.3	7.5043
350	542.66	2882.7	3167.6	7.6112	517.76	2882.4	3167.2	7.5892
400	587.58	2963.2	3271.7	7.7719	560.68	2963.0	3271.3	7.7500
450	632.26	3045.0	3376.9	7.9226	603.37	3044.7	3376.6	7.9008
500	676.80	3128.2	3483.5	8.0651	645.91	3128.0	3483.2	8.0433
550	721.23	3213.0	3591.6	8.2006	688.34	3212.8	3591.4	8.1789
600	765.57	3299.4	3701.3	8.3299	730.68	3299.2	3701.1	8.3083
Sat liq	1.099	662.6	663.2	1.9142	1.101	669.8	670.4	1.9308
Sat vap	328.41	2584.8	2753.6	6.7720	315.47	2566.2	2755.5	6.7575
175	345.20	2596.6	2795.1	6.8664	330.16	2595.3	2793.3	6.8437
200	367.90	2639.6	2851.1	6.9880	352.04	2638.5	2849.7	6.9662
220	385.54	2672.9	2894.6	7.0781	369.03	2672.1	2893.5	7.0567

(continued)

$P = 550$ kPa, $T^{\text{sat}} = 155.47$ °C

$P = 525$ kPa, $T^{\text{sat}} = 153.69$ °C

$P = 600$ kPa, $T^{\text{sat}} = 158.84$ °C

$P = 575$ kPa, $T^{\text{sat}} = 157.18$ °C

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
240	402.85	2705.7	2937.3	7.1630	385.68	2705.0	2936.4	7.1419
260	419.92	2738.0	2979.5	7.2436	402.08	2737.4	2978.7	7.2228
280	436.81	2770.1	3021.3	7.3206	418.31	2769.6	3020.6	7.3000
300	453.56	2802.1	3062.9	7.3945	434.39	2801.6	3062.3	7.3740
325	474.36	2842.0	3114.8	7.4831	454.35	2841.6	3114.3	7.4628
350	495.03	2882.1	3166.7	7.5681	474.19	2881.7	3166.2	7.5479
400	536.12	2962.7	3271.0	7.7290	513.61	2962.4	3270.6	7.7090
450	576.98	3044.5	3376.3	7.8799	552.80	3044.3	3376.0	7.8600
500	617.70	3127.8	3482.9	8.0226	591.84	3127.6	3482.7	8.0027
550	658.30	3212.6	3591.1	8.1581	630.78	3212.4	3590.9	8.1383
600	698.83	3299.1	3700.9	8.2876	669.63	3298.9	3700.7	8.2678
	$P = 625$ kPa, $T^{\text{sat}} = 160.44$ °C				$P = 650$ kPa, $T^{\text{sat}} = 161.99$ °C			
Sat liq	1.103	676.7	677.4	1.9469	1.105	683.4	684.1	1.9623
Sat vap	303.54	2567.5	2757.2	6.7437	292.49	2568.7	2758.9	6.7304
175	316.31	2593.9	2791.6	6.8217	303.53	2592.5	2789.8	6.8004
200	337.45	2637.5	2848.4	6.9451	323.98	2636.4	2847.0	6.9247
220	353.83	2671.2	2892.3	7.0361	339.80	2670.3	2891.2	7.0162
240	369.87	2704.2	2935.4	7.1217	355.29	2703.5	2934.4	7.1021
260	385.67	2736.8	2977.8	7.2028	370.52	2736.2	2977.0	7.1835
280	401.28	2769.1	3019.9	7.2802	385.56	2768.5	3019.2	7.2611
300	416.75	2801.2	3061.7	7.3544	400.47	2800.7	3061.0	7.3355
325	435.94	2841.2	3113.7	7.4433	418.95	2840.9	3113.2	7.4245
350	455.01	2881.4	3165.7	7.5285	437.31	2881.0	3165.3	7.5099
400	492.89	2962.1	3270.2	7.6897	473.78	2961.8	3269.8	7.6712

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
450	530.55	3044.0	3375.6	7.8408	510.01	3043.8	3375.3	7.8224
500	568.05	3127.4	3482.4	7.9836	546.10	3127.2	3482.1	7.9652
550	605.45	3212.2	3590.7	8.1192	582.07	3212.1	3590.4	8.1009
600	642.76	3298.8	3700.5	8.2488	617.96	3298.6	3700.3	8.2305
$P = 675$ kPa, $T^{\text{sat}} = 163.49$ °C								
Sat liq	1.106	689.9	690.7	1.9773	1.108	696.3	697.1	1.9918
Sat vap	282.23	2570.0	2760.5	6.7176	272.68	2571.1	2762.0	6.7052
175	291.69	2591.1	2788.0	6.7798	280.89	2589.7	2786.2	6.7598
200	311.51	2635.4	2845.6	6.9050	299.92	2634.3	2844.2	6.8859
220	326.81	2669.5	2890.1	6.9970	314.75	2668.6	2888.9	6.9784
240	341.78	2702.8	2933.5	7.0833	329.23	2702.1	2932.5	7.0651
260	356.49	2735.6	2976.2	7.1650	343.46	2735.0	2975.4	7.1470
280	371.01	2768.0	3018.5	7.2428	357.50	2767.5	3017.7	7.2250
300	385.39	2800.3	3060.4	7.3173	371.39	2799.8	3059.8	7.2997
325	403.22	2840.5	3112.6	7.4064	388.61	2840.1	3112.1	7.3890
350	420.92	2880.7	3164.8	7.4919	405.71	2880.3	3164.3	7.4745
400	456.07	2961.6	3269.4	7.6534	439.64	2961.3	3269.0	7.6362
450	491.00	3043.6	3375.0	7.8046	473.34	3043.3	3374.7	7.7875
500	525.77	3127.0	3481.8	7.9475	506.89	3126.8	3481.6	7.9305
550	560.43	3211.9	3590.2	8.0833	540.33	3211.7	3589.9	8.0663
600	595.00	3298.5	3700.1	8.2129	573.68	3298.3	3699.9	8.1959
$P = 725$ kPa, $T^{\text{sat}} = 166.38$ °C								
Sat liq	1.110	702.5	703.3	2.0059				
Sat vap	263.77	2572.2	2763.4	6.6932				

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
175	270.45	2588.3	2784.4	6.7404				
200	289.13	2633.2	2842.8	6.8673				
220	303.51	2667.7	2887.7	6.9604				
240	317.55	2701.3	2931.5	7.0474				
260	331.33	2734.3	2974.6	7.1296				
280	344.92	2767.0	3017.0	7.2078				
300	358.36	2799.3	3059.1	7.2827				
325	375.01	2839.7	3111.5	7.3721				
350	391.54	2880.0	3163.8	7.4578				
400	424.33	2961.0	3268.7	7.6196				
450	456.90	3043.1	3374.3	7.7710				
500	489.31	3126.6	3481.3	7.9140				
550	521.61	3211.5	3589.7	8.0499				
600	553.83	3298.1	3699.7	8.1796				
	$P = 750$ kPa, $T^{\text{sat}} = 167.76$ °C				$P = 775$ kPa, $T^{\text{sat}} = 169.10$ °C			
Sat liq	1.112	708.5	709.3	2.0195	1.113	714.3	715.2	2.0328
Sat vap	255.43	2573.3	2764.8	6.6817	247.61	2574.3	2766.2	6.6705
175	260.88	2586.9	2782.5	6.7215	251.93	2585.4	2780.7	6.7031
200	279.05	2632.1	2841.4	6.8494	269.63	2631.0	2840.0	6.8319
220	293.03	2666.8	2886.6	6.9429	283.22	2665.9	2885.4	6.9259
240	306.65	2700.6	2930.6	7.0303	296.45	2699.8	2929.6	7.0137
260	320.01	2733.7	2973.7	7.1128	309.41	2733.1	2972.9	7.0965
280	333.17	2766.4	3016.3	7.1912	322.19	2765.9	3015.6	7.1751
300	346.19	2798.9	3058.5	7.2662	334.81	2798.4	3057.9	7.2502

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
325	362.32	2839.3	3111.0	7.3558	350.44	2838.9	3110.5	7.3400
350	378.31	2879.6	3163.4	7.4416	365.94	2879.3	3162.9	7.4259
375	394.22	2920.1	3215.7	7.5240	381.35	2919.8	3215.3	7.5084
400	410.05	2960.7	3268.3	7.6035	396.69	2960.4	3267.9	7.5880
450	441.55	3042.9	3374.0	7.7550	427.20	3042.6	3373.7	7.7396
500	472.90	3126.3	3481.0	7.8981	457.56	3126.1	3480.8	7.8827
550	504.15	3211.4	3589.5	8.0340	487.81	3211.2	3589.2	8.0187
$P = 800$ kPa, $T^{\text{sat}} = 0.170.41^\circ\text{C}$								
Sat liq	1.115	720.0	720.9	2.0457	1.117	725.6	726.5	2.0583
Sat vap	240.26	2575.3	2767.5	6.6596	233.34	2576.2	2768.7	6.6491
175	243.53	2584.0	2778.8	6.6851	235.64	2582.5	2776.9	6.6675
200	260.79	2629.9	2838.6	6.8148	252.48	2628.8	2837.1	6.7982
220	274.02	2665.0	2884.2	6.9094	265.37	2664.1	2883.1	6.8933
240	286.88	2699.1	2928.6	6.9976	277.90	2698.4	2927.6	6.9819
260	299.48	2732.5	2972.1	7.0807	290.15	2731.8	2971.2	7.0653
280	311.89	2765.4	3014.9	7.1595	302.21	2764.8	3014.1	7.1443
300	324.14	2797.9	3057.3	7.2348	314.12	2797.5	3056.6	7.2197
325	339.31	2838.5	3109.9	7.3247	328.85	2838.1	3109.4	7.3098
350	354.34	2878.9	3162.4	7.4107	343.45	2878.6	3161.9	7.3959
375	369.29	2919.5	3214.9	7.4932	357.96	2919.1	3214.5	7.4786
400	384.16	2960.2	3267.5	7.5729	372.39	2959.9	3267.1	7.5583
450	413.74	3042.4	3373.4	7.7246	401.10	3042.2	3373.1	7.7101
500	443.17	3125.9	3480.5	7.8678	429.65	3125.7	3480.2	7.8533
550	472.49	3211.0	3589.0	8.0038	458.10	3210.8	3588.8	7.9894

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
	$P = 850$ kPa, $T^{\text{sat}} = 172.94$ °C				$P = 875$ kPa, $T^{\text{sat}} = 174.16$ °C			
Sat liq	1.118	731.1	732.0	2.0705	1.120	736.4	737.4	2.0825
Sat vap	226.81	2577.1	2769.9	6.6388	220.65	2578.0	2771.0	6.6289
175	228.21	2581.1	2775.1	6.6504	221.20	2579.6	2773.1	6.6336
200	244.66	2627.7	2835.7	6.7820	237.29	2626.6	2834.2	6.7662
220	257.24	2663.2	2881.9	6.8777	249.56	2662.3	2880.7	6.8624
240	269.44	2697.6	2926.6	6.9666	261.46	2696.8	2925.6	6.9518
260	281.37	2731.2	2970.4	7.0503	273.09	2730.6	2969.5	7.0357
280	293.10	2764.3	3013.4	7.1295	284.51	2763.7	3012.7	7.1152
300	304.68	2797.0	3056.0	7.2051	295.79	2796.5	3055.3	7.1909
325	319.00	2837.7	3108.8	7.2954	309.72	2837.3	3108.3	7.2813
350	333.20	2878.2	3161.4	7.3815	323.53	2877.9	3161.0	7.3676
375	347.29	2918.8	3214.0	7.4643	337.24	2918.5	3213.6	7.4504
400	361.31	2959.6	3266.7	7.5441	350.87	2959.3	3266.3	7.5303
450	389.20	3041.9	3372.7	7.6960	377.98	3041.7	3372.4	7.6823
500	416.93	3125.5	3479.9	7.8393	404.94	3125.3	3479.7	7.8257
550	444.56	3210.7	3588.5	7.9754	431.79	3210.5	3588.3	7.9618
	$P = 900$ kPa, $T^{\text{sat}} = 175.36$ °C				$P = 925$ kPa, $T^{\text{sat}} = 176.53$ °C			
Sat liq	1.121	741.6	742.6	2.0941	1.123	746.8	747.8	2.1055
Sat vap	214.81	2578.8	2772.1	6.6192	209.28	2579.6	2773.2	6.6097
200	230.32	2625.5	2832.7	6.7508	223.73	2624.3	2831.3	6.7357
220	242.31	2661.4	2879.5	6.8475	235.46	2660.5	2878.3	6.8329
240	253.93	2696.1	2924.6	6.9373	246.80	2695.3	2923.6	6.9231
260	265.27	2729.9	2968.7	7.0215	257.87	2729.3	2967.8	7.0076

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	
280	276.40	2763.2	3012.0	7.1012	268.73	2762.6	3011.2	7.0875	
300	287.39	2796.1	3054.7	7.1771	279.44	2795.6	3054.1	7.1636	
325	300.96	2836.9	3107.7	7.2676	292.66	2836.5	3107.2	7.2543	
350	314.40	2877.5	3160.5	7.3540	305.76	2877.2	3160.2	7.3408	
375	327.74	2918.2	3213.2	7.4370	318.75	2917.9	3212.7	7.4238	
400	341.01	2959.0	3266.0	7.5169	331.68	2958.8	3265.6	7.5038	
450	367.39	3041.4	3372.1	7.6689	357.36	3041.2	3371.8	7.6560	
500	393.61	3125.1	3479.4	7.8124	382.90	3124.9	3479.1	7.7995	
550	419.73	3210.3	3588.1	7.9486	408.32	3210.1	3587.8	7.9357	
600	445.76	3297.1	3698.2	8.0785	433.66	3296.9	3698.0	8.0657	
		$P = 950$ kPa, $T^{\text{sat}} = 177.67$ °C				$P = 975$ kPa, $T^{\text{sat}} = 178.79$ °C			
Sat liq	1.124	751.8	752.8	2.1166	1.126	756.7	757.8	2.1275	
Sat vap	204.03	2580.4	2774.2	6.6005	199.04	2581.1	2775.2	6.5916	
200	217.48	2623.2	2829.8	6.7209	211.55	2622.0	2828.3	6.7064	
220	228.96	2659.5	2877.0	6.8187	222.79	2658.6	2875.8	6.8048	
240	240.05	2694.6	2922.6	6.9093	233.64	2693.8	2921.6	6.8958	
260	250.86	2728.7	2967.0	6.9941	244.20	2728.0	2966.1	6.9809	
280	261.46	2762.1	3010.5	7.0742	254.56	2761.5	3009.7	7.0612	
300	271.91	2795.1	3053.4	7.1505	264.76	2794.6	3052.8	7.1377	
325	284.81	2836.0	3106.6	7.2413	277.35	2835.6	3106.1	7.2286	
350	297.57	2876.8	3159.5	7.3279	289.81	2876.5	3159.0	7.3154	
375	310.24	2917.6	3212.3	7.4110	302.17	2917.3	3211.9	7.3986	
400	322.84	2958.5	3265.2	7.4911	314.45	2958.2	3264.8	7.4787	
450	347.87	3041.0	3371.5	7.6433	338.86	3040.7	3371.1	7.6310	

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
500	372.74	3124.7	3478.8	7.7869	363.11	3124.5	3478.6	7.7747
550	397.51	3209.9	3587.6	7.9232	387.26	3209.8	3587.3	7.9110
600	422.19	3296.7	3697.8	8.0532	411.32	3296.6	3697.6	8.0410
$P = 1050$ kPa, $T^{\text{sat}} = 182.02$ °C								
Sat liq	1.127	761.5	762.6	2.1382	1.130	770.8	772.0	2.1588
Sat vap	194.29	2581.9	2776.2	6.5828	185.45	2583.3	2778.0	6.5659
200	205.92	2620.9	2826.8	6.6922	195.45	2618.5	2823.8	6.6645
220	216.93	2657.7	2874.6	6.7911	206.04	2655.8	2872.1	6.7647
240	227.55	2693.0	2920.6	6.8825	216.24	2691.5	2918.5	6.8569
260	237.89	2727.4	2965.2	6.9680	226.15	2726.1	2963.5	6.9430
280	248.01	2761.0	3009.0	7.0485	235.84	2759.9	3007.5	7.0240
300	257.98	2794.2	3052.1	7.1251	245.37	2793.2	3050.8	7.1009
325	270.27	2835.2	3105.5	7.2163	257.12	2834.4	3104.4	7.1924
350	282.43	2876.1	3158.5	7.3031	268.74	2875.4	3157.6	7.2795
375	294.50	2917.0	3211.5	7.3864	280.25	2916.3	3210.6	7.3629
400	306.49	2957.9	3264.4	7.4665	291.69	2957.4	3263.6	7.4432
450	330.30	3040.5	3370.8	7.6190	314.41	3040.0	3370.2	7.5958
500	353.96	3124.3	3478.3	7.7627	336.97	3123.9	3477.7	7.7397
550	377.52	3209.6	3587.1	7.8991	359.43	3209.2	3586.6	7.8762
600	400.98	3296.4	3697.4	8.0292	381.79	3296.1	3697.0	8.0063
$P = 1150$ kPa, $T^{\text{sat}} = 186.05$ °C								
Sat liq	1.133	779.9	781.1	2.1786	1.136	788.6	789.9	2.1977
Sat vap	177.38	2584.5	2779.7	6.5497	169.99	2585.8	2781.3	6.5342
200	185.92	2616.2	2820.7	6.6379	177.22	2613.8	2817.6	6.6122

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
220	196.14	2653.9	2869.6	6.7392	187.10	2651.9	2867.1	6.7147
240	205.96	2689.9	2916.4	6.8323	196.56	2688.3	2914.4	6.8066
260	215.47	2724.7	2961.8	6.9190	205.73	2723.4	2960.0	6.8959
280	224.77	2758.8	3006.0	7.0005	214.67	2757.7	3004.5	6.9779
300	233.91	2792.2	3049.6	7.0778	223.44	2791.3	3048.2	7.0556
325	245.16	2833.6	3103.3	7.1695	234.25	2832.8	3102.2	7.1476
350	256.28	2874.7	3156.6	7.2569	244.91	2874.0	3155.6	7.2352
375	267.30	2915.7	3209.7	7.3405	255.47	2915.1	3208.9	7.3190
400	278.24	2956.8	3262.9	7.4209	265.96	2956.2	3262.1	7.3995
450	299.96	3039.6	3369.5	7.5737	286.77	3039.1	3368.9	7.5525
500	321.53	3123.5	3477.2	7.7177	307.42	3123.1	3476.6	7.6966
550	342.98	3208.9	3586.2	7.8543	327.97	3208.5	3585.7	7.8333
600	364.35	3295.8	3696.6	7.9845	348.42	3295.5	3696.2	7.9636
	$P = 1200$ kPa, $T^{\text{sat}} = 187.96$ °C				$P = 1250$ kPa, $T^{\text{sat}} = 189.81$ °C			
Sat liq	1.139	797.1	798.4	2.2161	1.141	805.3	806.7	2.2338
Sat vap	163.20	2586.9	2782.7	6.5194	156.93	2588.0	2784.1	6.5050
200	169.23	2611.3	2814.4	6.5872	161.88	2608.9	2811.2	6.5630
220	178.80	2650.0	2864.5	6.6909	171.17	2648.0	2861.9	6.6680
240	187.95	2686.7	2912.2	6.7858	180.02	2685.1	2910.1	6.7637
260	196.79	2722.1	2958.2	6.8738	188.56	2720.8	2956.5	6.8523
280	205.40	2756.5	3003.0	6.9562	196.88	2755.4	3001.5	6.9353
300	213.85	2790.3	3046.9	7.0342	205.02	2789.3	3045.6	7.0136
325	224.24	2832.0	3101.0	7.1266	215.03	2831.1	3099.9	7.1064
350	234.49	2873.3	3154.6	7.2144	224.90	2872.5	3153.7	7.1944

(continued)

Table F.4 (continued)

$T\text{ }^{\circ}\text{C}$	$V\text{ cm}^3/\text{g}$	$U\text{ kJ/kg}$	$H\text{ kJ/kg}$	$S\text{ kJ/kg K}$	$V\text{ cm}^3/\text{g}$	$U\text{ kJ/kg}$	$H\text{ kJ/kg}$	$S\text{ kJ/kg K}$
375	244.63	2914.4	3208.0	7.2983	234.66	2913.8	3207.1	7.2785
400	254.70	2955.7	3261.3	7.3790	244.35	2955.1	3260.5	7.3593
450	274.68	3038.6	3368.2	7.5323	263.55	3038.1	3367.6	7.5128
500	294.50	3122.7	3476.1	7.6765	282.60	3122.3	3475.5	7.6571
550	314.20	3208.2	3585.2	7.8132	301.54	3207.8	3584.7	7.7940
600	333.82	3295.2	3695.8	7.9436	320.39	3294.9	3695.4	7.9244
$P = 1300\text{ kPa}, T^{\text{sat}} = 191.61\text{ }^{\circ}\text{C}$								
Sat liq	1.144	813.2	814.7	2.2510				
Sat vap	151.13	2589.0	2785.4	6.4913				
200	155.09	2606.4	2808.0	6.5394				
220	164.11	2646.0	2859.3	6.6457				
240	172.70	2683.5	2908.0	6.7424				
260	180.97	2719.4	2954.7	6.8316				
280	189.01	2754.3	3000.0	6.9151				
300	196.87	2788.4	3044.3	6.9938				
325	206.53	2830.3	3098.8	7.0869				
350	216.05	2871.8	3152.7	7.1751				
375	225.46	2913.2	3206.3	7.2594				
400	234.79	2954.5	3259.7	7.3404				
450	253.28	3037.7	3366.9	7.4940				
500	271.62	3121.9	3475.0	7.6385				
550	289.85	3207.5	3584.3	7.7754				
600	307.99	3294.6	3695.0	7.9060				

(continued)

Table F.4 (continued)

T °C	P = 1350 kPa, T ^{sat} = 193.35 °C		P = 1400 kPa, T ^{sat} = 195.04 °C		P = 1500 kPa, T ^{sat} = 198.29 °C			
	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
Sat liq	1.146	820.9	822.5	2.2676	1.149	828.5	830.1	2.2837
Sat vap	145.74	2589.9	2786.6	6.4780	140.72	2590.8	2787.8	6.4651
200	148.79	2603.9	2804.7	6.5165	142.94	2601.3	2801.4	6.4941
225	159.70	2653.6	2869.2	6.6493	153.57	2651.7	2866.7	6.6285
250	169.96	2700.1	2929.5	6.7675	163.55	2698.6	2927.6	6.7477
275	179.79	2744.4	2987.1	6.8750	173.08	2743.2	2985.5	6.8560
300	189.33	2787.4	3043.0	6.9746	182.32	2786.4	3041.6	6.9561
325	198.66	2829.5	3097.7	7.0681	191.35	2828.6	3096.5	7.0499
350	207.85	2871.1	3151.7	7.1566	200.24	2870.4	3150.7	7.1386
375	216.93	2912.5	3205.4	7.2410	209.02	2911.9	3204.5	7.2233
400	225.94	2953.9	3259.0	7.3221	217.72	2953.4	3258.2	7.3045
425	234.88	2995.5	3312.6	7.4003	226.35	2994.9	3311.8	7.3828
450	243.78	3037.2	3366.3	7.4759	234.95	3036.7	3365.6	7.4585
475	252.63	3079.2	3420.2	7.5493	243.50	3078.7	3419.6	7.5319
500	261.46	3121.5	3474.4	7.6205	252.02	3121.1	3473.9	7.6032
550	279.03	3207.1	3583.8	7.7576	268.98	3206.8	3583.3	7.7404
Sat liq	1.151	835.8	837.5	2.2993	1.154	842.9	844.7	2.3145
Sat vap	136.04	2591.6	2788.9	6.4526	131.66	2592.4	2789.9	6.4406
200	137.48	2598.7	2798.1	6.4722	132.38	2596.1	2794.7	6.4508
225	147.86	2649.7	2864.1	6.6082	142.53	2647.7	2861.5	6.5885
250	157.57	2697.1	2925.5	6.7286	151.99	2695.5	2923.5	6.7099
275	166.83	2742.0	2983.9	6.8376	161.00	2740.8	2982.3	6.8196

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
300	175.79	2785.4	3040.3	6.9381	169.70	2784.4	3038.9	6.9207
325	184.54	2827.8	3095.4	7.0322	178.19	2826.9	3094.2	7.0152
350	193.15	2869.7	3149.7	7.1212	186.53	2868.9	3148.7	7.1044
375	201.65	2911.3	3203.6	7.2061	194.77	2910.6	3202.8	7.1894
400	210.06	2952.8	3257.4	7.2874	202.92	2952.2	3256.6	7.2709
425	218.42	2994.4	3311.1	7.3658	211.01	2993.9	3310.4	7.3494
450	226.72	3036.2	3365.0	7.4416	219.05	3035.8	3364.3	7.4253
475	234.99	3078.3	3419.0	7.5151	227.06	3077.9	3418.4	7.4989
500	243.23	3120.7	3473.3	7.5865	235.03	3120.3	3472.8	7.5703
550	259.62	3206.4	3582.9	7.7237	250.89	3206.0	3582.4	7.7077
$P = 1550$ kPa, $T^{\text{sat}} = 199.85$ °C								
Sat liq	1.156	849.9	851.7	2.3292	1.159	856.7	858.6	2.3436
Sat vap	127.55	2593.2	2790.8	6.4289	123.69	2593.8	2791.7	6.4175
200	127.61	2593.5	2791.3	6.4298	....	....	....	....
225	137.54	2645.8	2858.9	6.5692	132.85	2643.7	2856.3	6.5503
250	146.77	2694.0	2921.5	6.6917	141.87	2692.4	2919.4	6.6740
275	155.54	2739.5	2980.6	6.8022	150.42	2738.3	2979.0	6.7852
300	164.00	2783.4	3037.6	6.9038	158.66	2782.4	3036.2	6.8873
325	172.25	2826.1	3093.1	6.9986	166.68	2825.2	3091.9	6.9825
350	180.34	2868.2	3147.7	7.0881	174.54	2867.5	3146.7	7.0723
375	188.33	2910.0	3201.9	7.1733	182.30	2909.3	3201.0	7.1577
400	196.24	2951.7	3255.8	7.2550	189.97	2951.1	3255.0	7.2394
425	204.08	2993.4	3309.7	7.3336	197.58	2992.9	3309.0	7.3182
450	211.87	3035.3	3363.7	7.4095	205.15	3034.8	3363.0	7.3942

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
475	219.63	3077.4	3417.8	7.4832	212.67	3077.0	3417.2	7.4679
500	227.35	3119.8	3472.2	7.5547	220.16	3119.4	3471.7	7.5395
550	242.72	3205.7	3581.9	7.6921	235.06	3205.3	3581.4	7.6770
$P = 1650$ kPa, $T^{\text{sat}} = 202.86$ °C								
Sat liq	1.161	863.4	865.3	2.3576	1.163	869.9	871.8	2.3713
Sat vap	120.05	2594.5	2792.6	6.4065	116.62	2595.1	2793.4	6.3957
225	128.45	2641.7	2853.6	6.5319	124.31	2639.6	2851.0	6.5138
250	137.27	2690.9	2917.4	6.6567	132.94	2689.3	2915.3	6.6398
275	145.61	2737.1	2977.3	6.7687	141.09	2735.8	2975.6	6.7526
300	153.64	2781.3	3034.8	6.8713	148.91	2780.3	3033.5	6.8557
325	161.44	2824.4	3090.8	6.9669	156.51	2823.5	3089.6	6.9516
350	169.09	2866.7	3145.7	7.0569	163.96	2866.0	3144.7	7.0419
375	176.63	2908.7	3200.1	7.1425	171.30	2908.0	3199.2	7.1277
400	184.09	2950.5	3254.2	7.2244	178.55	2949.9	3253.5	7.2098
425	191.48	2992.3	3308.3	7.3032	185.74	2991.8	3307.6	7.2887
450	198.82	3034.3	3362.4	7.3794	192.87	3033.9	3361.7	7.3649
475	206.13	3076.5	3416.7	7.4531	199.97	3076.1	3416.1	7.4388
500	213.40	3119.0	3471.1	7.5248	207.04	3118.6	3470.6	7.5105
550	227.86	3205.0	3581.0	7.6624	221.09	3204.6	3580.5	7.6482
600	242.24	3292.4	3692.1	7.7934	235.06	3292.1	3691.7	7.7793
$P = 1750$ kPa, $T^{\text{sat}} = 205.72$ °C								
Sat liq	1.166	876.2	878.3	2.3846	1.168	882.5	884.6	2.3976
Sat vap	113.38	2595.7	2794.1	6.3853	110.32	2596.3	2794.8	6.3751
225	120.39	2637.6	2848.2	6.4961	116.69	2635.5	2845.5	6.4787

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
250	128.85	2687.7	2913.2	6.6233	124.99	2686.1	2911.0	6.6071
275	136.82	2734.5	2974.0	6.7368	132.78	2733.3	2972.3	6.7214
300	144.45	2779.3	3032.1	6.8405	140.24	2778.2	3030.7	6.8257
325	151.87	2822.7	3088.4	6.9368	147.48	2821.8	3087.3	6.9223
350	159.12	2865.3	3143.7	7.0273	154.55	2864.5	3142.7	7.0131
375	166.27	2907.4	3198.4	7.1133	161.51	2906.7	3197.5	7.0993
400	173.32	2949.3	3252.7	7.1955	168.39	2948.8	3251.9	7.1816
425	180.32	2991.3	3306.9	7.2746	175.20	2990.8	3306.1	7.2608
450	187.26	3033.4	3361.1	7.3509	181.97	3032.9	3360.4	7.3372
475	194.17	3075.7	3415.5	7.4248	188.69	3075.2	3414.9	7.4112
500	201.04	3118.2	3470.0	7.4965	195.38	3117.8	3469.5	7.4830
550	214.71	3204.3	3580.0	7.6344	208.68	3203.9	3579.5	7.6209
600	228.28	3291.8	3691.3	7.7656	221.89	3291.5	3690.9	7.7522
	$P = 1850$ kPa, $T^{\text{sat}} = 208.47$ °C				$P = 1900$ kPa, $T^{\text{sat}} = 209.80$ °C			
Sat liq	1.170	888.6	890.8	2.4103	1.172	894.6	896.8	2.4228
Sat vap	107.41	2596.8	2795.5	6.3651	104.65	2597.3	2796.1	6.3554
225	113.19	2633.3	2842.8	6.4616	109.87	2631.2	2840.0	6.4448
250	121.33	2684.4	2908.9	6.5912	117.87	2682.8	2906.7	6.5757
275	128.96	2732.0	2970.6	6.7064	125.35	2730.7	2968.8	6.6917
300	136.26	2777.2	3029.3	6.8112	132.49	2776.2	3027.9	6.7970
325	143.33	2820.9	3086.1	6.9082	139.39	2820.1	3084.9	6.8944
350	150.23	2863.8	3141.7	6.9993	146.14	2863.0	3140.7	6.9857
375	157.02	2906.1	3196.6	7.0856	152.76	2905.4	3195.7	7.0723
400	163.73	2948.2	3251.1	7.1681	159.30	2947.6	3250.3	7.1550

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
425	170.37	2990.3	3305.4	7.2474	165.78	2989.7	3304.7	7.2344
450	176.96	3032.4	3359.8	7.3239	172.21	3031.9	3359.1	7.3109
475	183.50	3074.8	3414.3	7.3980	178.59	3074.3	3413.7	7.3851
500	190.02	3117.4	3468.9	7.4698	184.94	3117.0	3468.4	7.4570
550	202.97	3203.6	3579.1	7.6079	197.57	3203.2	3578.6	7.5951
600	215.84	3291.1	3690.4	7.7392	210.11	3290.8	3690.0	7.7265
$P = 1950$ kPa, $T^{\text{sat}} = 211.10$ °C								
Sat liq	1.174	900.5	902.8	2.4349	1.177	906.2	908.6	2.4469
Sat vap	102.03	2597.7	2796.7	6.3459	99.54	2598.2	2797.2	6.3366
225	106.72	2629.0	2837.1	6.4283	103.72	2626.9	2834.3	6.4120
250	114.58	2681.1	2904.6	6.5604	111.45	2679.5	2902.4	6.5454
275	121.91	2729.4	2967.1	6.6772	118.65	2728.1	2965.4	6.6631
300	128.90	2775.1	3026.5	6.7831	125.50	2774.0	3025.0	6.7696
325	135.66	2819.2	3083.7	6.8809	132.11	2818.3	3082.5	6.8677
350	142.25	2862.3	3139.7	6.9725	138.56	2861.5	3138.6	6.9596
375	148.72	2904.8	3194.8	7.0593	144.89	2904.1	3193.9	7.0466
400	155.11	2947.0	3249.5	7.1421	151.13	2946.4	3248.7	7.1296
425	161.43	2989.2	3304.0	7.2216	157.30	2988.7	3303.3	7.2092
450	167.70	3031.5	3358.5	7.2983	163.42	3031.0	3357.8	7.2859
475	173.93	3073.9	3413.1	7.3725	169.51	3073.5	3412.5	7.3602
500	180.13	3116.6	3467.8	7.4445	175.55	3116.2	3467.3	7.4323
550	192.44	3202.9	3578.1	7.5827	187.57	3202.5	3577.6	7.5706
600	204.67	3290.5	3689.6	7.7142	199.50	3290.2	3689.2	7.7022

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
	$P = 2100$ kPa, $T^{\text{sat}} = 214.85$ °C				$P = 2200$ kPa, $T^{\text{sat}} = 217.24$ °C			
Sat liq	1.181	917.5	920.0	2.4700	1.185	928.3	931.0	2.4922
Sat vap	94.89	2598.9	2798.2	6.3187	90.65	2599.6	2799.1	6.3015
225	98.15	2622.4	2828.5	6.3802	93.07	2617.9	2822.7	6.3492
250	105.64	2676.1	2897.9	6.5162	100.35	2672.7	2893.4	6.4879
275	112.59	2725.4	2961.9	6.6356	107.07	2722.7	2958.3	6.6091
300	119.18	2771.9	3022.2	6.7432	113.43	2769.7	3019.3	6.7179
325	125.53	2816.5	3080.1	6.8422	119.53	2814.7	3077.7	6.8177
350	131.70	2860.0	3136.6	6.9347	125.47	2858.5	3134.5	6.9107
375	137.76	2902.8	3192.1	7.0220	131.28	2901.5	3190.3	6.9985
400	143.73	2945.3	3247.1	7.1053	137.00	2944.1	3245.5	7.0821
425	149.63	2987.6	3301.8	7.1851	142.65	2986.6	3300.4	7.1621
450	155.48	3030.0	3356.5	7.2621	148.25	3029.1	3355.2	7.2393
475	161.28	3072.6	3411.3	7.3365	153.81	3071.7	3410.1	7.3139
500	167.06	3115.3	3466.2	7.4087	159.34	3114.5	3465.1	7.3862
550	178.53	3201.8	3576.7	7.5472	170.30	3201.1	3575.7	7.5249
600	189.91	3289.6	3688.4	7.6789	181.19	3289.0	3687.6	7.6568
	$P = 2300$ kPa, $T^{\text{sat}} = 219.55$ °C							
Sat liq	1.189	938.9	941.6	2.5136				
Sat vap	86.77	2600.2	2799.8	6.2849				
225	88.42	2613.3	2816.7	6.3190				
250	95.51	2669.2	2888.9	6.4605				
275	102.03	2720.0	2954.7	6.5835				
300	108.18	2767.6	3016.4	6.6935				

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
325	114.06	2812.9	3075.3	6.7941				
350	119.77	2857.0	3132.4	6.8877				
375	125.36	2900.2	3188.5	6.9759				
400	130.85	2942.9	3243.9	7.0598				
425	136.28	2985.5	3299.0	7.1401				
450	141.65	3028.1	3353.9	7.2174				
475	146.99	3070.8	3408.9	7.2922				
500	152.28	3113.7	3464.0	7.3646				
550	162.80	3200.4	3574.8	7.5035				
600	173.22	3288.3	3686.7	7.6355				
	$P = 2400$ kPa, $T^{\text{sat}} = 221.78$ °C				$P = 2500$ kPa, $T^{\text{sat}} = 223.94$ °C			
Sat liq	1.193	949.1	951.9	2.5343	1.197	959.0	962.0	2.5543
Sat vap	83.20	2600.7	2800.4	6.2690	79.91	2601.2	2800.9	6.2536
225	84.15	2608.6	2810.6	6.2894	80.21	2603.8	2804.3	6.2604
250	91.08	2665.6	2884.2	6.4338	86.99	2662.0	2879.5	6.4077
275	97.41	2717.3	2951.1	6.5586	93.15	2714.5	2947.4	6.5345
300	103.36	2765.4	3013.4	6.6699	98.93	2763.1	3010.4	6.6470
325	109.05	2811.1	3072.8	6.7714	104.43	2809.3	3070.4	6.7494
350	114.55	2855.4	3130.4	6.8656	109.75	2853.9	3128.2	6.8442
375	119.93	2898.8	3186.7	6.9542	114.94	2897.5	3184.8	6.9333
400	125.22	2941.7	3242.3	7.0384	120.04	2940.6	3240.7	7.0178
425	130.44	2984.5	3297.5	7.1189	125.07	2983.4	3296.1	7.0986
450	135.61	3027.1	3352.6	7.1964	130.04	3026.2	3351.3	7.1763
475	140.73	3069.9	3407.7	7.2713	134.97	3069.0	3406.5	7.2513

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
500	145.82	3112.9	3462.9	7.3439	139.87	3112.1	3461.7	7.3240
525	150.88	3156.1	3518.2	7.4144	144.74	3155.4	3517.2	7.3946
550	155.91	3199.6	3573.8	7.4830	149.58	3198.9	3572.9	7.4633
$P = 2600$ kPa, $T^{\text{sat}} = 226.04$ °C								
Sat liq	1.201	968.6	971.7	2.5736	1.205	978.0	981.2	2.5924
Sat vap	76.86	2601.5	2801.4	6.2387	74.03	2601.8	2801.7	6.2244
250	83.21	2658.4	2874.7	6.3823	79.70	2654.7	2869.9	6.3575
275	89.22	2711.7	2943.6	6.5110	85.58	2708.8	2939.8	6.4882
300	94.83	2760.9	3007.4	6.6249	91.04	2758.6	3004.4	6.6034
325	100.17	2807.4	3067.9	6.7281	96.22	2805.6	3065.4	6.7075
350	105.32	2852.3	3126.1	6.8236	101.21	2850.7	3124.0	6.8036
375	110.33	2896.1	3183.0	6.9131	106.07	2894.8	3181.2	6.8935
400	115.26	2939.4	3239.0	6.9979	110.83	2938.2	3237.4	6.9787
425	120.11	2982.3	3294.6	7.0789	115.52	2981.2	3293.1	7.0600
450	124.91	3025.2	3349.9	7.1568	120.15	3024.2	3348.6	7.1381
475	129.66	3068.1	3405.3	7.2320	124.74	3067.2	3404.0	7.2134
500	134.38	3111.2	3460.6	7.3048	129.30	3110.4	3459.5	7.2863
525	139.07	3154.6	3516.2	7.3755	133.82	3153.8	3515.2	7.3571
550	143.74	3198.2	3571.9	7.4443	138.33	3197.5	3571.0	7.4260
600	153.01	3286.5	3684.3	7.5768	147.27	3285.8	3683.5	7.5587
$P = 2800$ kPa, $T^{\text{sat}} = 230.05$ °C								
Sat liq	1.209	987.1	990.5	2.6106	1.213	996.0	999.5	2.6283
Sat vap	71.39	2602.1	2802.0	6.2104	68.93	2602.3	2802.2	6.1969
250	76.44	2650.9	2864.9	6.3331	73.40	2647.1	2859.9	6.3092

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
275	82.19	2705.9	2936.0	6.4659	79.03	2702.9	2932.1	6.4441
300	87.51	2756.3	3001.3	6.5824	84.23	2754.0	2998.2	6.5621
325	92.55	2803.7	3062.8	6.6875	89.13	2801.8	3060.3	6.6681
350	97.40	2849.2	3121.9	6.7842	93.84	2847.6	3119.7	6.7654
375	102.10	2893.4	3179.3	6.8746	98.41	2892.0	3177.4	6.8563
400	106.71	2937.0	3235.8	6.9601	102.88	2935.8	3234.1	6.9421
425	111.25	2980.2	3291.7	7.0416	107.28	2979.1	3290.2	7.0239
450	115.74	3023.2	3347.3	7.1199	111.62	3022.3	3346.0	7.1024
475	120.17	3066.3	3402.8	7.1954	115.92	3065.5	3401.6	7.1780
500	124.58	3109.6	3458.4	7.2685	120.18	3108.8	3457.3	7.2512
525	128.95	3153.1	3514.1	7.3394	124.42	3152.3	3513.1	7.3222
550	133.30	3196.8	3570.0	7.4084	128.62	3196.1	3569.1	7.3913
600	141.94	3285.2	3682.6	7.5412	136.97	3284.6	3681.8	7.5243
	$P = 3000$ kPa, $T^{\text{sat}} = 233.84$ °C		$P = 3100$ kPa, $T^{\text{sat}} = 235.67$ °C					
Sat liq	1.216	1004.7	1008.4	2.6455	1.220	1013.2	1017.0	2.6623
Sat vap	66.63	2602.4	2802.3	6.1837	64.47	2602.5	2802.3	6.1709
250	70.55	2643.2	2854.8	6.2857	67.89	2639.2	2849.6	6.2626
275	76.08	2700.0	2928.2	6.4228	73.32	2697.0	2924.2	6.4019
300	81.16	2751.6	2995.1	6.5422	78.29	2749.2	2991.9	6.5227
325	85.94	2799.9	3057.7	6.6491	82.96	2797.9	3055.1	6.6307
350	90.53	2846.0	3117.5	6.7471	87.42	2844.3	3115.4	6.7294
375	94.97	2890.7	3175.6	6.8385	91.75	2889.3	3173.7	6.8212
400	99.31	2934.6	3232.5	6.9246	95.97	2933.4	3230.8	6.9077
425	103.58	2978.0	3288.7	7.0067	100.11	2976.9	3287.3	6.9900

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
450	107.79	3021.3	3344.6	7.0854	104.20	3020.3	3343.3	7.0689
475	111.95	3064.6	3400.4	7.1612	108.24	3063.7	3399.2	7.1448
500	116.08	3107.9	3456.2	7.2345	112.24	3107.1	3455.1	7.2183
525	120.18	3151.5	3512.1	7.3056	116.22	3150.8	3511.0	7.2895
550	124.26	3195.4	3568.1	7.3748	120.17	3194.7	3567.2	7.3588
600	132.34	3284.0	3681.0	7.5079	128.01	3283.3	3680.2	7.4920
$P = 3200$ kPa, $T^{\text{sat}} = 237.45$ °C								
Sat liq	1.224	1021.5	1025.4	2.6786	1.227	1029.7	1033.7	2.6945
Sat vap	62.44	2602.5	2802.3	6.1585	60.53	2602.5	2802.3	6.1463
250	65.38	2635.2	2844.4	6.2398	63.02	2631.1	2839.0	6.2173
275	70.27	2693.9	2920.2	6.3815	68.28	2690.8	2916.1	6.3614
300	75.59	2746.8	2988.7	6.5037	73.06	2744.4	2985.5	6.4851
325	80.16	2796.0	3052.5	6.6127	77.53	2794.0	3049.9	6.5951
350	84.51	2842.7	3113.2	6.7120	81.78	2841.1	3110.9	6.6952
375	88.72	2887.9	3171.8	6.8043	85.88	2886.5	3169.9	6.7879
400	92.83	2932.1	3229.2	6.8912	89.88	2930.9	3227.5	5.8752
425	96.86	2975.9	3285.8	6.9738	93.81	2974.8	3284.3	6.9580
450	100.83	3019.3	3342.0	7.0528	97.67	3018.3	3340.6	7.0373
475	104.76	3062.8	3398.0	7.1290	101.49	3061.9	3396.8	7.1136
500	108.65	3106.3	3454.0	7.2026	105.27	3105.5	3452.8	7.1873
525	112.51	3150.0	3510.0	7.2739	109.02	3149.2	3509.0	7.2588
550	116.34	3193.9	3566.2	7.3433	112.74	3193.2	3565.3	7.3282
600	123.95	3282.7	3679.3	7.4767	120.13	3282.1	3678.5	7.4618

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
	$P = 3400$ kPa, $T^{\text{sat}} = 240.88$ °C				$P = 3500$ kPa, $T^{\text{sat}} = 242.54$ °C			
Sat liq	1.231	1037.6	1041.8	2.7101	1.235	1045.4	1049.8	2.7253
Sat vap	58.73	3602.5	2802.1	6.1344	57.03	2602.4	2802.0	6.1228
250	60.80	2626.9	2833.6	6.1951	58.69	2622.7	2828.1	6.1732
275	65.98	2687.7	2912.0	6.3416	63.81	2684.5	2907.8	6.3221
300	70.68	2741.9	2982.2	6.4669	68.42	2739.5	2979.0	6.4491
325	75.05	2792.0	3047.2	6.5779	72.71	2790.0	3044.5	6.5611
350	79.20	2839.4	3108.7	6.6787	76.78	2837.8	3106.5	6.6626
375	83.21	2885.1	3168.0	6.7719	80.69	2883.7	3166.1	6.7563
400	87.11	2929.7	3225.9	6.8595	84.49	2928.4	3224.2	6.8443
425	90.93	2973.7	3282.8	6.9426	88.22	2972.6	3281.3	6.9277
450	94.69	3017.4	3339.3	7.0221	91.89	3016.4	3338.0	7.0074
475	98.41	3061.0	3395.5	7.0986	95.51	3060.1	3394.3	7.0840
500	102.09	3104.6	3451.7	7.1724	99.09	3103.8	3450.6	7.1580
525	105.74	3148.4	3507.9	7.2440	102.64	3147.7	3506.9	7.2297
550	109.36	3192.5	3564.3	7.3136	106.17	3191.8	3563.4	7.2993
600	116.54	3281.5	3677.7	7.4473	113.15	3280.8	3676.9	7.4332
	$P = 3600$ kPa, $T^{\text{sat}} = 244.16$ °C				$P = 3700$ kPa, $T^{\text{sat}} = 245.75$ °C			
Sat liq	1.238	1053.1	1057.6	2.7401	1.242	1060.6	1065.2	2.7547
Sat vap	55.415	2602.2	2801.7	6.1115	53.888	2602.1	2801.4	6.1004
250	56.702	2618.4	2822.5	6.1514	54.812	2614.0	2816.8	6.1299
275	61.759	2681.3	2903.6	6.3030	59.814	2678.0	2899.3	6.2841
300	66.297	2737.0	2975.6	6.4315	64.282	2734.4	2972.3	6.4143
325	70.501	2788.0	3041.8	6.5446	68.410	2786.0	3039.1	6.5284

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	
350	74.482	2836.1	3104.2	6.6468	72.311	2834.4	3102.0	6.6314	
375	78.308	2882.3	3164.2	6.7411	76.055	2880.8	3162.2	6.7262	
400	82.024	2927.2	3222.5	6.8294	79.687	2926.0	3220.8	6.8149	
425	85.660	2971.5	3279.8	6.9131	83.238	2970.4	3278.4	6.8989	
450	89.236	3015.4	3336.6	6.9930	86.728	3014.4	3335.3	6.9790	
475	92.764	3059.2	3393.1	7.0698	90.171	3058.2	3391.9	7.0559	
500	96.255	3103.0	3449.5	7.1439	93.576	3102.1	3448.4	7.1302	
525	99.716	3146.9	3505.9	7.2157	96.950	3146.1	3504.9	7.2021	
550	103.150	3191.1	3562.4	7.2854	100.300	3190.4	3561.5	7.2719	
600	109.960	3280.2	3676.1	7.4195	106.930	3279.6	3675.2	7.4061	
$P = 3800$ kPa, $T^{\text{sat}} = 247.31$ °C									
Sat liq	1.245	1068.0	1072.7	2.7689	1.249	1075.3	1080.1	2.7828	
Sat vap	52.438	2601.9	2801.1	6.0896	51.061	2601.6	2800.8	6.0789	
250	53.017	2609.5	2811.0	6.1085	51.308	2605.0	2805.1	6.0872	
275	57.968	2674.7	2895.0	6.2654	56.215	2671.4	2890.6	6.2470	
300	62.372	2731.9	2968.9	6.3973	60.558	2729.3	2965.5	6.3806	
325	66.429	2783.9	3036.4	6.5126	64.547	2781.9	3033.6	6.4970	
350	70.254	2832.7	3099.7	6.6163	68.302	2831.0	3097.4	6.6015	
375	73.920	2879.4	3160.3	6.7117	71.894	2877.9	3158.3	6.6974	
400	77.473	2924.7	3219.1	6.8007	75.372	2923.5	3217.4	6.7868	
425	80.944	2969.3	3276.8	6.8849	78.767	2968.2	3275.3	6.8713	
450	84.353	3013.4	3333.9	6.9653	82.099	3012.4	3332.6	6.9519	
475	87.714	3057.3	3390.7	7.0424	85.383	3056.4	3389.4	7.0292	
500	91.038	3101.3	3447.2	7.1168	88.629	3100.5	3446.1	7.1037	

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
525	94.330	3145.4	3503.8	7.1888	91.844	3144.6	3502.8	7.1759
550	97.596	3189.6	3560.5	7.2587	95.033	3188.9	3559.5	7.2459
600	104.060	3279.0	3674.4	7.3931	101.350	3278.3	3673.6	7.3804
$P = 4000$ kPa, $T^{\text{sat}} = 250.33$ °C								
Sat liq	1.252	1082.4	1087.4	2.7965				
Sat vap	49.749	2601.3	2800.3	6.0685				
275	54.546	2668.0	2886.1	6.2288				
300	58.833	2726.7	2962.0	6.3642				
325	62.759	2779.8	3030.8	6.4817				
350	66.446	2829.3	3095.1	6.5870				
375	69.969	2876.5	3156.4	6.6834				
400	73.376	2922.2	3215.7	6.7733				
425	76.698	2967.0	3273.8	6.8581				
450	79.958	3011.4	3331.2	6.9388				
475	83.169	3055.5	3388.2	7.0163				
500	86.341	3099.6	3445.0	7.0909				
525	89.483	3143.8	3501.7	7.1632				
550	92.598	3188.2	3558.6	7.2333				
600	98.763	3277.7	3672.8	7.3680				
650	104.860	3368.4	3787.9	7.4961				
$P = 4100$ kPa, $T^{\text{sat}} = 251.80$ °C								
Sat liq	1.256	1089.4	1094.6	2.8099	1.259	1096.3	1101.6	2.8231
Sat vap	48.500	2601.0	2799.9	6.0583	47.307	2600.7	2799.4	6.0482
260	50.150	2624.6	2830.3	6.1157	48.654	2620.4	2824.8	6.0962

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
275	52.955	2664.5	2881.6	6.2107	51.438	2661.0	2877.1	6.1929
300	57.191	2724.0	2958.5	6.3480	55.625	2721.4	2955.0	6.3320
325	61.057	2777.7	3028.0	6.4667	59.435	2775.6	3025.2	6.4519
350	64.680	2827.6	3092.8	6.5727	62.998	2825.8	3090.4	6.5587
375	68.137	2875.0	3154.4	6.6697	66.392	2873.6	3152.4	6.6563
400	71.476	2920.9	3214.0	6.7600	69.667	2919.7	3212.3	6.7469
425	74.730	2965.9	3272.3	6.8450	72.856	2964.8	3270.8	6.8323
450	77.921	3010.4	3329.9	6.9260	75.981	3009.4	3328.5	6.9135
475	81.062	3054.6	3387.0	7.0037	79.056	3053.7	3385.7	6.9913
500	84.165	3098.8	3443.9	7.0785	82.092	3097.9	3442.7	7.0662
525	87.236	3143.0	3500.7	7.1508	85.097	3142.3	3499.7	7.1387
550	90.281	3187.5	3557.6	7.2210	88.075	3186.8	3556.7	7.2090
575	93.303	3232.1	3614.7	7.2893	91.030	3231.5	3613.8	7.2774
	$P = 4300$ kPa, $T^{\text{sat}} = 254.66$ °C				$P = 4400$ kPa, $T^{\text{sat}} = 256.05$ °C			
Sat liq	1.262	1103.1	1108.5	2.8360	1.266	1109.8	1115.4	2.8487
Sat vap	46.168	2600.3	2798.9	6.0383	45.079	2599.9	2798.3	6.0286
260	47.223	2616.2	2819.2	6.0768	45.853	2611.8	2813.6	6.0575
275	49.988	2657.5	2872.4	6.1752	48.601	2653.9	2867.8	6.1577
300	54.130	2718.7	2951.4	6.3162	52.702	2716.0	2947.8	6.3006
325	57.887	2773.4	3022.3	6.4373	56.409	2771.3	3019.5	6.4230
350	61.393	2824.1	3088.1	6.5450	59.861	2822.3	3085.7	6.5315
375	64.728	2872.1	3150.4	6.6431	63.139	2870.6	3148.4	6.6301
400	67.942	2918.4	3210.5	6.7341	66.295	2917.1	3208.8	6.7216
425	71.069	2963.7	3269.3	6.8198	69.363	2962.5	3267.7	6.8076

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
450	74.131	3008.4	3327.1	6.9012	72.365	3007.4	3325.8	6.8892
475	77.143	3052.8	3384.5	6.9792	75.317	3051.9	3383.3	6.9674
500	80.116	3097.1	3441.6	7.0543	78.229	3096.3	3440.5	7.0426
525	83.057	3141.5	3498.6	7.1269	81.110	3140.7	3497.6	7.1153
550	85.971	3186.0	3555.7	7.1973	83.963	3185.3	3554.7	7.1858
575	88.863	3230.8	3612.9	7.2658	86.794	3230.1	3612.0	7.2544
$P = 4500$ kPa, $T^{\text{sat}} = 257.41$ °C								
Sat liq	1.269	1116.4	1122.1	2.8612	1.272	1122.9	1128.8	2.8735
Sat vap	44.037	2599.5	2797.7	6.0191	43.038	2599.1	2797.0	6.0097
260	44.540	2607.4	2807.9	6.0382	43.278	2602.9	2802.0	6.0190
275	47.273	2650.3	2863.0	6.1403	46.000	2646.6	2858.2	6.1230
300	51.336	2713.2	2944.2	6.2852	50.027	2710.4	2940.5	6.2700
325	54.996	2769.1	3016.6	6.4088	53.643	2766.9	3013.7	6.3949
350	58.396	2820.5	3083.3	6.5182	56.994	2818.7	3080.9	6.5050
375	61.620	2869.1	3146.4	6.6174	60.167	2867.6	3144.4	6.6049
400	64.721	2915.8	3207.1	6.7093	63.215	2914.5	3205.3	6.6972
425	67.732	2961.4	3266.2	6.7955	66.172	2960.3	3264.7	6.7838
450	70.677	3006.3	3324.4	6.8774	69.063	3005.3	3323.0	6.8659
475	73.572	3050.9	3382.0	6.9558	71.903	3050.0	3380.8	6.9444
500	76.427	3095.4	3439.3	7.0311	74.702	3094.6	3438.2	7.0199
525	79.249	3139.9	3496.6	7.1040	77.469	3139.2	3495.5	7.0928
550	82.044	3184.6	3553.8	7.1746	80.209	3183.9	3552.8	7.1636
575	84.817	3229.5	3611.1	7.2432	82.926	3228.8	3610.2	7.2323

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
	$P = 4700$ kPa, $T^{\text{sat}} = 260.07$ °C				$P = 4800$ kPa, $T^{\text{sat}} = 261.37$ °C			
Sat liq	1.276	1129.3	1135.3	2.8555	1.279	1135.6	1141.8	2.8974
Sat vap	42.081	2598.6	2796.4	6.0004	41.161	2598.1	2795.7	5.9913
275	44.778	2642.9	2853.3	6.1058	43.604	2639.1	2848.4	6.0887
300	48.772	2707.6	2936.8	6.2549	47.569	2704.8	2933.1	6.2399
325	52.346	2764.7	3010.7	6.3811	51.103	2762.5	3007.8	6.3675
350	55.651	2816.9	3078.5	6.4921	54.364	2815.1	3076.1	6.4794
375	58.775	2866.1	3142.3	6.5926	57.441	2864.6	3140.3	6.5805
400	61.773	2913.2	3203.6	6.6853	60.390	2911.9	3201.8	6.6736
425	64.679	2959.1	3263.1	6.7722	63.247	2958.0	3261.6	6.7608
450	67.517	3004.3	3321.6	6.8545	66.036	3003.3	3320.3	6.8434
475	70.304	3049.1	3379.5	6.9332	68.773	3048.2	3378.3	6.9223
500	73.051	3093.7	3437.1	7.0089	71.469	3092.9	3435.9	6.9981
525	75.765	3138.4	3494.5	7.0819	74.132	3137.6	3493.4	7.0712
550	78.452	3183.1	3551.9	7.1527	76.768	3182.4	3550.9	7.1422
575	81.116	3228.1	3609.3	7.2215	79.381	3227.4	3608.5	7.2110
600	83.760	3273.3	3667.0	7.2885	81.973	3272.7	3666.2	7.2781
	$P = 4900$ kPa, $T^{\text{sat}} = 262.55$ °C				$P = 5000$ kPa, $T^{\text{sat}} = 263.91$ °C			
Sat liq	1.282	1141.9	1148.2	2.9091	1.286	1148.0	1154.5	2.9206
Sat vap	40.278	2597.6	2794.9	5.9823	39.429	2597.0	2794.2	5.9735
275	42.475	2635.2	2843.3	6.0717	41.388	2631.3	2838.2	6.0547
300	46.412	2701.9	2929.3	6.2252	45.301	2699.0	2925.5	6.2105
325	49.909	2760.2	3004.8	6.3541	48.762	2758.0	3001.8	6.3408
350	53.128	2813.3	3073.6	6.4669	51.941	2811.5	3071.2	6.4545

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
375	56.161	2863.0	3138.2	6.5685	54.932	2861.5	3136.2	6.5568
400	59.064	2910.6	3200.0	6.6621	57.791	2909.3	3198.3	6.6508
425	61.874	2956.9	3260.0	6.7496	60.555	2955.7	3258.5	6.7386
450	64.615	3002.3	3318.9	6.8324	63.250	3001.2	3317.5	6.8217
475	67.303	3047.2	3377.0	6.9115	65.893	3046.3	3375.8	6.9009
500	69.951	3092.0	3434.8	6.9874	68.494	3091.2	3433.7	6.9770
525	72.565	3136.8	3492.4	7.0607	71.061	3136.0	3491.3	7.0504
550	75.152	3181.7	3549.9	7.1318	73.602	3181.0	3549.0	7.1215
575	77.716	3226.8	3607.6	7.2007	76.119	3226.1	3606.7	7.1906
600	80.260	3272.0	3665.3	7.2678	78.616	3271.4	3664.5	7.2578
	$P = 5100$ kPa, $T^{\text{sat}} = 265.15$ °C				$P = 5200$ kPa, $T^{\text{sat}} = 268.37$ °C			
Sat liq	1.289	1154.1	1160.7	2.9319	1.292	1160.1	1166.8	2.9431
Sat vap	38.611	2596.5	2793.4	5.9648	37.824	2595.9	2792.6	5.9561
275	40.340	2627.3	2833.1	6.0378	39.330	2623.3	2827.8	6.0210
300	44.231	2696.1	2921.7	6.1960	43.201	2693.1	2917.8	6.1815
325	47.660	2755.7	2998.7	6.3277	46.599	2753.4	2995.7	6.3147
350	50.801	2809.6	3068.7	6.4423	49.703	2807.8	3066.2	6.4302
375	53.750	2860.0	3134.1	6.5452	52.614	2858.4	3132.0	6.5338
400	56.567	2908.0	3196.5	6.6396	55.390	2906.7	3194.7	6.6287
425	59.288	2954.5	3256.9	6.7278	58.070	2953.4	3255.4	6.7172
450	61.940	3000.2	3316.1	6.8111	60.679	2999.2	3314.7	6.8007
475	64.537	3045.4	3374.5	6.8905	63.234	3044.5	3373.3	6.8803
500	67.094	3090.3	3432.5	6.9668	65.747	3089.5	3431.4	6.9567
525	69.616	3135.3	3490.3	7.0403	68.227	3134.5	3489.3	7.0304

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
550	72.112	3180.2	3548.0	7.1115	70.679	3179.5	3547.1	7.1017
575	74.584	3225.4	3605.8	7.1807	73.108	3224.7	3604.9	7.1709
600	77.035	3270.8	3663.7	7.2479	75.516	3270.2	3662.8	7.2382
$P = 5300$ kPa, $T^{\text{sat}} = 267.58$ °C								
Sat liq	1.296	1166.1	1172.9	2.9541	1.299	1171.9	1178.9	2.9650
Sat vap	37.066	2595.3	2791.7	5.9476	36.334	2594.6	2790.8	5.9392
275	38.354	2619.2	2822.5	6.0041	37.411	2615.0	2817.0	5.9873
300	42.209	2690.1	2913.8	6.1672	41.251	2687.1	2909.8	6.1530
325	45.577	2751.0	2992.6	6.3018	44.591	2748.7	2989.5	6.2891
350	48.647	2805.9	3063.7	6.4183	47.628	2804.0	3061.2	6.4066
375	51.520	2856.9	3129.9	6.5225	50.486	2855.3	3127.8	6.5114
400	54.257	2905.3	3192.9	6.6179	53.166	2904.0	3191.1	6.6072
425	56.897	2952.2	3253.8	6.7067	55.768	2951.1	3252.2	6.6963
450	59.466	2998.2	3313.3	6.7905	58.297	2997.1	3311.9	6.7804
475	61.980	3043.5	3372.0	6.8703	60.772	3042.6	3370.8	6.8604
500	64.452	3088.6	3430.2	6.9468	63.204	3087.8	3429.1	6.9371
525	66.890	3133.7	3488.2	7.0206	65.603	3132.9	3487.2	7.0110
550	69.300	3178.8	3546.1	7.0920	67.973	3178.1	3545.1	7.0825
575	71.687	3224.1	3604.0	7.1613	70.320	3223.4	3603.1	7.1519
600	74.054	3269.5	3662.0	7.2287	72.646	3268.9	3661.2	7.2194
$P = 5500$ kPa, $T^{\text{sat}} = 269.93$ °C								
Sat liq	1.302	1177.7	1184.9	2.9757	1.306	1183.5	1190.8	2.9863
Sat vap	35.628	2594.0	2789.9	5.9309	34.946	2593.3	2789.0	5.9227
275	36.499	2610.8	2811.5	5.9705	35.617	2606.5	2805.9	5.9537

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
300	40.327	2684.0	2905.8	6.1388	39.434	2680.9	2901.7	6.1248
325	43.641	2746.3	2986.4	6.2765	42.724	2744.0	2983.2	6.2640
350	46.647	2802.1	3058.7	6.3949	45.700	2800.2	3056.1	6.3834
375	49.450	2853.7	3125.7	6.5004	48.470	2852.1	3123.6	6.4896
400	52.115	2902.7	3189.3	6.5967	51.100	2901.3	3187.5	6.5863
425	54.679	2949.9	3250.6	6.6862	53.630	2948.7	3249.0	6.6761
450	57.171	2996.1	3310.5	6.7705	56.085	2995.0	3309.1	6.7607
475	59.608	3041.7	3369.5	6.8507	58.486	3040.7	3368.2	6.8411
500	62.002	3086.9	3427.9	6.9275	60.843	3086.1	3426.8	6.9181
525	64.362	3132.1	3486.1	7.0015	63.165	3131.3	3485.1	6.9922
550	66.694	3177.3	3544.2	7.0731	65.460	3176.6	3543.2	7.0639
575	69.002	3222.7	3602.2	7.1426	67.731	3222.0	3601.3	7.1335
600	71.289	3268.3	3660.4	7.2102	69.981	3267.6	3659.5	7.2011
	$P = 5700$ kPa, $T^{\text{sat}} = 272.22$ °C							
Sat liq	1.309	1189.1	1196.6	2.9968				
Sat vap	34.288	2592.6	2788.0	5.9146				
275	34.761	2602.1	2800.2	5.9369				
300	38.571	2677.8	2897.6	6.1108				
325	41.838	2741.6	2980.0	6.2516				
350	44.785	2798.3	3053.5	6.3720				
375	47.525	2850.5	3121.4	6.4789				
400	50.121	2899.9	3185.6	6.5761				
425	52.617	2947.5	3247.5	6.6663				
450	55.038	2994.0	3307.7	6.7511				

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
475	57.403	3039.8	3367.0	6.8316				
500	59.724	3085.2	3425.6	6.9088				
525	62.011	3130.5	3484.0	6.9831				
550	64.270	3175.9	3542.2	7.0549				
575	66.504	3221.3	3600.4	7.1245				
600	68.719	3267.0	3658.7	7.1923				
$P = 5800$ kPa, $T^{\text{sat}} = 273.35$ °C								
Sat liq	1.312	1194.7	1202.3	3.0071	1.315	1200.3	1208.0	3.0172
Sat vap	33.651	2591.9	2787.0	5.9066	33.034	2591.1	2786.0	5.8986
280	34.756	2614.4	2816.0	5.9592	33.953	2610.2	2810.5	5.9431
290	36.301	2645.7	2856.3	6.0314	35.497	2642.1	2851.5	6.0166
300	37.736	2674.6	2893.5	6.0969	36.928	2671.4	2889.3	6.0830
325	40.982	2739.1	2976.8	6.2393	40.154	2736.7	2973.6	6.2272
350	43.902	2796.3	3051.0	6.3608	43.048	2794.4	3048.4	6.3496
375	46.611	2848.9	3119.3	6.4683	45.728	2847.3	3117.1	6.4578
400	49.176	2898.6	3183.8	6.5660	48.252	2897.2	3182.0	6.5560
425	51.638	2946.4	3245.9	6.6565	50.693	2945.2	3244.3	6.6469
450	54.026	2992.9	3306.3	6.7416	53.048	2991.9	3304.9	6.7322
475	56.357	3038.8	3365.7	6.8223	55.346	3037.9	3364.4	6.8132
500	58.644	3084.4	3424.5	6.8996	57.600	3083.5	3423.3	6.8906
525	60.896	3129.8	3483.0	6.9740	59.819	3129.0	3481.9	6.9652
550	63.120	3175.2	3541.2	7.0460	62.010	3174.4	3540.3	7.0372
575	65.320	3220.7	3599.5	7.1157	64.176	3220.0	3598.6	7.1070

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
	$P = 6000$ kPa, $T^{\text{sat}} = 275.55$ °C		$P = 6100$ kPa, $T^{\text{sat}} = 276.63$ °C					
Sat liq	1.319	1205.8	1213.7	3.0273	1.322	1211.2	1219.3	3.0372
Sat vap	32.438	2590.4	2785.0	5.8908	31.860	2589.6	2783.9	5.8830
280	33.173	2605.9	2804.9	5.9270	32.415	2601.5	2799.3	5.9108
290	34.718	2638.4	2846.7	6.0017	33.962	2634.6	2841.8	5.9869
300	36.145	2668.1	2885.0	6.0692	35.386	2664.8	2880.7	6.0555
325	39.353	2734.2	2970.4	6.2151	38.577	2731.7	2967.1	6.2031
350	42.222	2792.4	3045.8	6.3386	41.422	2790.4	3043.1	6.3277
375	44.874	2845.7	3115.0	6.4475	44.048	2844.1	3112.8	6.4373
400	47.379	2895.8	3180.1	6.5462	46.524	2894.5	3178.3	6.5364
425	49.779	2944.0	3242.6	6.6374	48.895	2942.8	3241.0	6.6280
450	52.103	2990.8	3303.5	6.7230	51.189	2989.8	3302.0	6.7139
475	54.369	3036.9	3363.2	6.8041	53.424	3036.0	3361.9	6.7952
500	56.592	3082.6	3422.2	6.8818	55.616	3081.8	3421.0	6.8730
525	58.778	3128.2	3480.8	6.9564	57.771	3127.4	3479.8	6.9478
550	60.937	3173.7	3539.3	7.0285	59.898	3173.0	3538.3	7.0200
575	63.071	3219.3	3597.7	7.0985	62.001	3218.6	3596.8	7.0900
	$P = 6200$ kPa, $T^{\text{sat}} = 277.70$ °C		$P = 6300$ kPa, $T^{\text{sat}} = 278.75$ °C					
Sat liq	1.325	1216.6	1224.8	3.0471	1.328	1221.9	1230.3	3.0568
Sat vap	31.300	2588.8	2782.9	5.8753	30.757	2588.0	2781.8	5.8677
280	31.679	2597.1	2793.5	5.8946	30.962	2592.6	2787.6	5.8783
290	33.227	2630.8	2836.8	5.9721	32.514	2626.9	2831.7	5.9573
300	34.650	2661.5	2876.3	6.0418	33.935	2658.1	2871.9	6.0281
325	37.825	2729.2	2963.8	6.1911	37.097	2726.7	2960.4	6.1793

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
350	40.648	2788.5	3040.5	6.3168	39.898	2786.5	3037.8	6.3061
375	43.248	2842.4	3110.6	6.4272	42.473	2840.8	3108.4	6.4172
400	45.697	2893.1	3176.4	6.5268	44.895	2891.7	3174.5	6.5173
425	48.039	2941.6	3239.4	6.6188	47.210	2940.4	3237.8	6.6096
450	50.304	2988.7	3300.6	6.7049	49.447	2987.7	3299.2	6.6960
475	52.510	3035.0	3360.6	6.7864	51.624	3034.1	3359.3	6.7778
500	54.671	3080.9	3419.9	6.8644	53.757	3080.1	3418.7	6.8559
525	56.797	3126.6	3478.7	6.9393	55.853	3125.8	3477.7	6.9309
550	58.894	3172.2	3537.4	7.0116	57.921	3171.5	3536.4	7.0034
575	60.966	3218.0	3595.9	7.0817	59.964	3217.3	3595.0	7.0735
		$P = 6400$ kPa, $T^{\text{sat}} = 279.79$ °C			$P = 6500$ kPa, $T^{\text{sat}} = 280.82$ °C			
Sat liq	1.332	1227.2	1235.7	3.0664	1.335	1232.5	1241.1	3.0759
Sat vap	30.230	2587.2	2780.6	5.8601	29.719	2586.3	2779.5	5.8527
280	30.265	2587.9	2781.6	5.8619	....	....	....	....
290	31.821	2623.0	2826.6	5.9425	31.146	2619.0	2821.4	5.9277
300	33.241	2654.7	2867.5	6.0144	32.567	2651.2	2862.9	6.0008
325	36.390	2724.2	2957.1	6.1675	35.704	2721.6	2953.7	6.1558
350	39.170	2784.4	3035.1	6.2955	38.465	2782.4	3032.4	6.2849
375	41.722	2839.1	3106.2	6.4072	40.994	2837.5	3103.9	6.3974
400	44.119	2890.3	3172.7	6.5079	43.366	2888.9	3170.8	6.4986
425	46.407	2939.2	3236.2	6.6006	45.629	2938.0	3234.5	6.5917
450	48.617	2986.6	3297.7	6.6872	47.812	2985.5	3296.3	6.6786
475	50.767	3033.1	3358.0	6.7692	49.935	3032.2	3356.8	6.7608
500	52.871	3079.2	3417.6	6.8475	52.012	3078.3	3416.4	6.8392

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
525	54.939	3125.0	3476.6	6.9226	54.053	3124.2	3475.6	6.9145
550	56.978	3170.8	3535.4	6.9952	56.065	3170.0	3534.4	6.9871
575	58.993	3216.6	3594.1	7.0655	58.052	3215.9	3593.2	7.0575
$P = 6600$ kPa, $T^{\text{sat}} = 281.84$ °C								
Sat liq	1.338	1237.6	1246.5	3.0853	1.432	1242.8	1251.8	3.0946
Sat vap	29.223	2585.5	2778.3	5.8452	28.741	2584.6	2777.1	5.8379
290	30.490	2614.9	2816.1	5.9129	29.850	2610.8	2810.8	5.8980
300	31.911	2647.7	2858.4	5.9872	31.273	2644.2	2853.7	5.9736
325	35.038	2719.0	2950.2	6.1442	34.391	2716.4	2946.8	6.1326
350	37.781	2780.4	3029.7	6.2744	37.116	2778.3	3027.0	6.2640
375	40.287	2835.8	3101.7	6.3877	39.601	2834.1	3099.5	6.3781
400	42.636	2887.5	3168.9	6.4894	41.927	2886.1	3167.0	6.4803
425	44.874	2936.7	3232.9	6.5828	44.141	2935.5	3231.3	6.5741
450	47.031	2984.5	3294.9	6.6700	46.274	2983.4	3293.4	6.6616
475	49.129	3031.2	3355.5	6.7524	48.346	3030.3	3354.2	6.7442
500	51.180	3077.4	3415.2	6.8310	50.372	3076.6	3414.1	6.8229
525	53.194	3123.4	3474.5	6.9064	52.361	3122.6	3473.4	6.8985
550	55.179	3169.3	3533.5	6.9792	54.320	3168.6	3532.5	6.9714
575	57.139	3215.2	3592.3	7.0497	56.254	3214.5	3591.4	7.0419
600	59.079	3261.3	3651.2	7.1181	58.168	3260.7	3650.4	7.1104
$P = 6800$ kPa, $T^{\text{sat}} = 283.84$ °C								
Sat liq	1.345	1247.9	1257.0	3.1038	1.351	1258.0	1267.4	3.1219
Sat vap	28.272	2583.7	2775.9	5.8306	27.373	2581.8	2773.5	5.8162
290	29.226	2606.6	2805.3	5.8830	28.024	2597.9	2794.1	5.8530

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
300	30.652	2640.6	2849.0	5.9599	29.457	2633.2	2839.4	5.9327
325	33.762	2713.7	2943.3	6.1211	32.556	2708.4	2936.3	6.0982
350	36.470	2776.2	3024.2	6.2537	35.233	2772.1	3018.7	6.2333
375	38.935	2832.4	3097.2	6.3686	37.660	2829.0	3092.7	6.3497
400	41.239	2884.7	3165.1	6.4713	39.922	2881.8	3161.2	6.4536
425	43.430	2934.3	3229.6	6.5655	42.068	2931.8	3226.3	6.5485
450	45.539	2982.3	3292.0	6.6532	44.131	2980.1	3289.1	6.6368
475	47.587	3029.3	3352.9	6.7361	46.133	3027.4	3350.3	6.7201
500	49.588	3075.7	3412.9	6.8150	48.086	3074.0	3410.6	6.7993
525	51.552	3121.8	3472.4	6.8907	50.003	3120.2	3470.2	6.8753
550	53.486	3167.8	3531.5	6.9636	51.889	3166.3	3529.6	6.9485
575	55.395	3213.9	3590.5	7.0343	53.750	3212.5	3588.7	7.0193
600	57.283	3260.0	3649.6	7.1028	55.590	3258.8	3647.9	7.0880
	$P = 7200$ kPa, $T^{\text{sat}} = 287.70$ °C				$P = 7400$ kPa, $T^{\text{sat}} = 289.57$ °C			
Sat liq	1.358	1267.9	1277.6	3.1397	1.364	1277.6	1287.7	3.1571
Sat vap	26.522	2579.9	2770.9	5.8020	25.715	2578.0	2768.3	5.7880
290	26.878	2589.0	2782.5	5.8226	25.781	2579.7	2770.5	5.7919
300	28.321	2625.6	2829.5	5.9054	27.238	2617.8	2819.3	5.8779
325	31.413	2702.9	2929.1	6.0755	30.328	2697.3	2921.8	6.0530
350	34.063	2767.8	3013.1	6.2132	32.954	2763.5	3007.4	6.1933
375	36.454	2825.6	3088.1	6.3312	35.312	2822.1	3083.4	6.3130
400	38.676	2878.9	3157.4	6.4362	37.497	2876.0	3153.5	6.4190
425	40.781	2929.4	3223.0	6.5319	39.564	2926.9	3219.6	6.5156
450	42.802	2978.0	3286.1	6.6208	41.544	2975.8	3283.2	6.6050

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	
475	44.759	3025.4	3347.7	6.7044	43.460	3023.5	3345.1	6.6892	
500	46.668	3072.2	3408.2	6.7840	45.327	3070.4	3405.9	6.7691	
525	48.540	3118.6	3468.1	6.8602	47.156	3117.0	3466.0	6.8456	
550	50.381	3164.9	3527.6	6.9337	48.954	3163.4	3525.7	6.9192	
575	52.197	3211.1	3586.9	7.0047	50.727	3209.8	3585.1	6.9904	
600	53.991	3257.5	3646.2	7.0735	52.478	3256.2	3644.5	7.0594	
		$P = 7600$ kPa, $T^{\text{sat}} = 291.41$ °C				$P = 7800$ kPa, $T^{\text{sat}} = 293.21$ °C			
Sat liq	1.371	1287.2	1297.6	3.1742	1.378	1296.7	1307.4	3.1911	
Sat vap	24.949	2575.9	2765.5	5.7742	24.220	2573.8	2762.8	5.7605	
300	26.204	2609.7	2808.8	5.8503	25.214	2601.3	2798.0	5.8224	
325	29.297	2691.7	2914.3	6.0306	28.315	2685.9	2906.7	6.0082	
350	31.901	2759.2	3001.6	6.1737	30.900	2754.8	2995.8	6.1542	
375	34.229	2818.6	3078.7	6.2950	33.200	2815.1	3074.0	6.2773	
400	36.380	2873.1	3149.6	6.4022	35.319	2870.1	3145.6	6.3857	
425	38.409	2924.3	3216.3	6.4996	37.314	2921.8	3212.9	6.4839	
450	40.351	2973.6	3280.3	6.5896	39.220	2971.4	3277.3	6.5745	
475	42.228	3021.5	3342.5	6.6742	41.060	3019.6	3339.8	6.6596	
500	44.056	3068.7	3403.5	6.7545	42.850	3066.9	3401.1	6.7402	
525	45.845	3115.4	3463.8	6.8312	44.601	3113.8	3461.7	6.8172	
550	47.603	3161.9	3523.7	6.9051	46.320	3160.4	3521.7	6.8913	
575	49.335	3208.4	3583.3	6.9765	48.014	3207.0	3581.5	6.9629	
600	51.045	3254.9	3642.9	7.0457	49.686	3253.7	3641.2	7.0322	
650	54.413	3348.5	3762.1	7.1784	52.976	3347.4	3760.6	7.1652	

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
	$P = 8000$ kPa, $T^{\text{sat}} = 294.97$ °C							
Sat liq	1.384	1306.0	1317.1	3.2076				
Sat vap	23.525	2571.7	2759.9	5.7471				
300	24.264	2592.7	2786.8	5.7942				
325	27.378	2679.9	2899.0	5.9860				
350	29.948	2750.3	2989.9	6.1349				
375	32.222	2811.5	3069.2	6.2599				
400	34.310	2867.1	3141.6	6.3694				
425	36.273	2919.3	3209.5	6.4684				
450	38.145	2969.2	3274.3	6.5597				
475	39.950	3017.6	3337.2	6.6452				
500	41.704	3065.1	3398.8	6.7262				
525	43.419	3112.2	3459.5	6.8035				
550	45.102	3158.9	3519.7	6.8778				
575	46.759	3205.6	3579.7	6.9496				
600	48.394	3252.4	3639.5	7.0191				
650	51.611	3346.3	3759.2	7.1523				
	$P = 8400$ kPa, $T^{\text{sat}} = 298.39$ °C							
Sat liq	1.391	1315.2	1326.6	3.2239	1.398	1324.3	1336.1	3.2399
Sat vap	22.863	2569.5	2757.0	5.7338	22.231	2567.2	2754.0	5.7207
300	23.350	2583.7	2775.2	5.7656	22.469	2574.4	2763.1	5.7366
320	25.916	2657.7	2870.2	5.9288	25.058	2651.1	2861.6	5.9056
340	28.064	2718.5	2948.6	6.0588	27.203	2713.4	2941.9	6.0388
360	29.968	2771.5	3017.2	6.1689	29.094	2767.3	3011.7	6.1509

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	
380	31.715	2819.5	3079.5	6.2659	30.821	2816.0	3074.8	6.2491	
400	33.350	2864.1	3137.6	6.3534	32.435	2861.1	3133.5	6.3376	
425	35.282	2916.7	3206.0	6.4532	34.337	2914.1	3202.6	6.4383	
450	37.121	2966.9	3271.3	6.5452	36.147	2964.7	3268.3	6.5309	
475	38.893	3015.6	3334.5	6.6311	37.887	3013.6	3331.9	6.6173	
500	40.614	3063.3	3396.4	6.7124	39.576	3061.6	3394.0	6.6990	
525	42.295	3110.5	3457.3	6.7900	41.224	3108.9	3455.2	6.7769	
550	43.943	3157.4	3517.8	6.8646	42.839	3155.9	3515.8	6.8516	
575	45.566	3204.3	3577.9	6.9365	44.429	3202.9	3576.1	6.9238	
600	47.166	3251.1	3637.9	7.0062	45.996	3249.8	3636.2	6.9936	
$P = 8600$ kPa, $T^{\text{sat}} = 300.06$ °C					$P = 8800$ kPa, $T^{\text{sat}} = 301.70$ °C				
Sat liq	1.404	1333.3	1345.4	3.2557	1.411	1342.2	1354.6	3.2713	
Sat vap	21.627	2564.9	2750.9	5.7076	21.049	2562.6	2747.8	5.6948	
320	24.236	2644.3	2852.7	5.8823	23.446	2637.3	2843.6	5.8590	
340	26.380	2708.1	2935.0	6.0189	25.592	2702.8	2928.0	5.9990	
360	28.258	2763.1	3006.1	6.1330	27.459	2758.8	3000.4	6.1152	
380	29.968	2812.4	3070.1	6.2326	29.153	2808.8	3065.3	6.2162	
400	31.561	2858.0	3129.4	6.3220	30.727	2854.9	3125.3	6.3067	
425	33.437	2911.5	3199.1	6.4236	32.576	2908.9	3195.6	6.4092	
450	35.217	2962.4	3265.3	6.5168	34.329	2960.1	3262.2	6.5030	
475	36.928	3011.6	3329.2	6.6037	36.011	3009.6	3326.5	6.5904	
500	38.586	3059.8	3391.6	6.6858	37.640	3058.0	3389.2	6.6728	
525	40.202	3107.3	3453.0	6.7639	39.228	3105.6	3450.8	6.7513	
550	41.787	3154.4	3513.8	6.8390	40.782	3152.9	3511.8	6.8265	

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
575	43.345	3201.5	3574.3	6.9113	42.310	3200.1	3572.4	6.8990
600	44.880	3248.5	3634.5	6.9813	43.815	3247.2	3632.8	6.9692
625	46.397	3295.7	3694.7	7.0492	45.301	3294.5	3693.1	7.0373
$P = 9000$ kPa, $T^{\text{sat}} = 303.31$ °C								
Sat liq	1.418	1351.0	1363.7	3.2867	1.425	1359.7	1372.8	3.3018
Sat vap	20.495	2560.1	2744.6	5.6820	19.964	2557.7	2741.3	5.6694
320	22.685	2630.1	2834.3	5.8355	21.952	2622.7	2824.7	5.8118
340	24.836	2697.4	2920.9	5.9792	24.110	2691.9	2913.7	5.9594
360	26.694	2754.4	2994.7	6.0976	25.961	2750.0	2988.9	6.0801
380	28.372	2805.2	3060.5	6.2000	27.625	2801.5	3055.7	6.1840
400	29.929	2851.8	3121.2	6.2915	29.165	2848.7	3117.0	7.2765
425	31.754	2906.3	3192.0	6.3949	30.966	2903.6	3188.5	6.3808
450	33.480	2957.8	3259.2	6.4894	32.668	2955.5	3256.1	6.4760
475	35.136	3007.6	3323.8	6.5773	34.298	3005.6	3321.1	6.5644
500	36.737	3056.1	3386.8	6.6600	35.872	3054.3	3384.4	6.6475
525	38.296	3104.0	3448.7	6.7388	37.405	3102.3	3446.5	6.7266
550	39.822	3151.4	3509.8	6.8143	38.904	3149.9	3507.8	6.8023
575	41.321	3198.7	3570.6	6.8870	40.375	3197.3	3568.8	6.8752
600	42.798	3246.0	3631.1	6.9574	41.824	3244.7	3629.5	6.9457
625	44.255	3293.3	3691.6	7.0256	43.254	3292.1	3690.0	7.0141
$P = 9400$ kPa, $T^{\text{sat}} = 306.44$ °C								
Sat liq	1.432	1368.2	1381.7	3.3168	1.439	1376.7	1390.6	3.3315
Sat vap	19.455	2555.2	2738.0	5.6568	18.965	2552.6	2734.7	5.6444
320	21.245	2615.1	2814.8	5.7879	20.561	2607.3	2804.7	5.7637

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
340	23.412	2686.3	2906.3	5.9397	22.740	2680.5	2898.8	5.9199
360	25.257	2745.6	2983.0	6.0627	24.581	2741.0	2977.0	6.0454
380	26.909	2797.8	3050.7	6.1681	26.221	2794.1	3045.8	6.1524
400	28.433	2845.5	3112.8	6.2617	27.731	2842.3	3108.5	6.2470
425	30.212	2900.9	3184.9	6.3669	29.489	2898.2	3181.3	6.3532
450	31.891	2953.2	3253.0	6.4628	31.145	2950.9	3249.9	6.4498
475	33.495	3003.5	3318.4	6.5517	32.726	3001.5	3315.6	6.5392
500	35.045	3052.5	3381.9	6.6352	34.252	3050.7	3379.5	6.6231
525	36.552	3100.7	3444.3	6.7146	35.734	3099.0	3442.1	6.7028
550	38.024	3148.4	3505.9	6.7906	37.182	3146.9	3503.9	6.7790
575	39.470	3195.9	3566.9	6.8637	38.602	3194.5	3565.1	6.8523
600	40.892	3243.4	3627.8	6.9343	39.999	3242.1	3626.1	6.9231
$P = 9800$ kPa, $T^{\text{sat}} = 309.48$ °C								
Sat liq	1.446	1385.2	1399.3	3.3461	1.453	1393.5	1408.0	3.3605
Sat vap	18.494	2550.0	2731.2	5.6321	18.041	2547.3	2727.7	5.6198
320	19.899	2599.2	2794.3	5.7393	19.256	2590.9	2783.5	5.7145
340	22.093	2674.7	2891.2	5.9001	21.468	2668.7	2883.4	5.8803
360	23.931	2736.4	2971.0	6.0282	23.305	2731.8	2964.8	6.0110
380	25.561	2790.3	3040.8	6.1368	24.926	2786.4	3035.7	6.1213
400	27.056	2839.1	3104.2	6.2325	26.408	2835.8	3099.9	6.2182
425	28.795	2895.5	3177.7	6.3397	28.128	2892.8	3174.1	6.3264
450	30.429	2948.6	3246.8	6.4369	29.742	2946.2	3243.6	6.4243
475	31.988	2999.4	3312.9	6.5268	31.280	2997.4	3310.1	6.5147
500	33.491	3048.8	3377.0	6.6112	32.760	3047.0	3374.6	6.5994

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
525	34.949	3097.4	3439.9	6.6912	34.196	3095.7	3437.7	6.6797
550	36.373	3145.4	3501.9	6.7676	35.597	3143.9	3499.8	6.7564
575	37.769	3193.1	3563.3	6.8411	36.970	3191.7	3561.4	6.8302
600	39.142	3240.8	3624.4	6.9121	38.320	3239.5	3622.7	6.9013
$P = 10,200$ kPa, $T^{\text{sat}} = 312.42$ °C								
Sat liq	1.460	1401.8	1416.7	3.3748	1.467	1410.0	1425.2	3.3889
Sat vap	17.605	2544.6	2724.2	5.6076	17.184	2541.8	2720.6	5.5955
320	18.632	2582.3	2772.3	5.6894	18.024	2573.4	2760.8	5.6638
340	20.865	2662.6	2875.4	5.8604	20.282	2656.3	2867.2	5.8404
360	22.702	2727.0	2958.6	5.9940	22.121	2722.2	2952.3	5.9769
380	24.315	2782.6	3030.6	6.1059	23.726	2778.7	3025.4	6.0907
400	25.785	2832.6	3095.6	6.2040	25.185	2829.3	3091.2	6.1899
425	27.487	2890.0	3170.4	6.3131	26.870	2887.3	3166.7	6.3001
450	29.081	2943.9	3240.5	6.4118	28.446	2941.5	3237.3	6.3994
475	30.599	2995.3	3307.4	6.5027	29.943	2993.2	3304.6	6.4909
500	32.058	3045.2	3372.1	6.5879	31.382	3043.3	3369.7	6.5765
525	33.472	3094.0	3435.5	6.6685	32.776	3092.4	3433.2	6.6574
550	34.851	3142.3	3497.8	6.7454	34.134	3140.8	3495.8	6.7346
575	36.202	3190.3	3559.6	6.8194	35.464	3188.9	3557.8	6.8087
600	37.530	3238.2	3621.0	6.8907	36.770	3236.9	3619.3	6.8803
$P = 10600$ kPa, $T^{\text{sat}} = 315.27$ °C								
Sat liq	1.474	1418.1	1433.7	3.4029	1.481	1426.2	1442.4	3.4167
Sat vap	16.778	2539.0	2716.9	5.5835	16.385	2536.2	2713.1	5.5715
320	17.432	2564.1	2748.9	5.6376	16.852	2554.5	2736.5	5.6109

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
340	19.717	2649.9	2858.9	5.8203	19.170	2643.4	2850.4	5.8000
360	21.560	2717.4	2945.9	5.9599	21.018	2712.4	2939.4	5.9429
380	23.159	2774.7	3020.2	6.0755	22.612	2770.7	3014.9	6.0604
400	24.607	2825.9	3086.8	6.1759	24.050	2822.6	3082.3	6.1621
425	26.276	2884.5	3163.0	6.2872	25.703	2881.7	3159.3	6.2744
450	27.834	2939.1	3234.1	6.3872	27.245	2936.7	3230.9	6.3752
475	29.313	2991.1	3301.8	6.4793	28.706	2989.0	3299.0	6.4678
500	30.732	3041.4	3367.2	6.5652	30.106	3039.6	3364.7	6.5542
525	32.106	3090.7	3431.0	6.6465	31.461	3089.0	3428.8	6.6357
550	33.444	3139.3	3493.8	6.7239	32.779	3137.8	3491.8	6.7134
575	34.753	3187.5	3555.9	6.7983	34.069	3186.1	3554.1	6.7880
600	36.039	3235.6	3617.6	6.8700	35.335	3234.3	3615.9	6.8599
625	37.304	3283.6	3679.1	6.9394	36.580	3282.4	3677.5	6.9294
	$P = 11000$ kPa, $T^{\text{sat}} = 318.5$ °C				$P = 11200$ kPa, $T^{\text{sat}} = 319.40$ °C			
Sat liq	1.489	1434.2	1450.6	3.4304	1.496	1442.1	1458.9	3.4440
Sat vap	16.006	2533.2	2709.3	5.5595	15.639	2530.3	2705.4	5.5476
320	16.285	2544.4	2723.5	5.5835	15.726	2533.8	2710.0	5.5553
340	18.639	2636.7	2841.7	5.7797	18.124	2629.8	2832.8	5.7591
360	20.494	2707.4	2932.8	5.9259	19.987	2702.2	2926.1	5.9090
380	22.083	2766.7	3009.6	6.0454	21.573	2762.6	3004.2	6.0305
400	23.512	2819.2	3077.8	6.1483	22.993	2815.8	3073.3	6.1347
425	25.151	2878.9	3155.5	6.2617	24.619	2876.0	3151.7	6.2491
450	26.676	2934.3	3227.7	6.3633	26.128	2931.8	3224.5	6.3515
475	28.120	2986.9	3296.2	6.4564	27.555	2984.8	3293.4	6.4452

(continued)

Table F.4 (continued)

T °C	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K	V cm ³ /g	U kJ/kg	H kJ/kg	S kJ/kg K
500	29.503	3037.7	3362.2	6.5432	28.921	3035.8	3359.7	6.5324
525	30.839	3087.3	3426.5	6.6251	30.240	3085.6	3424.3	6.6147
550	32.139	3136.2	3489.7	6.7031	31.521	3134.7	3487.7	6.6929
575	33.410	3184.7	3552.2	6.7779	32.774	3183.3	3550.4	6.7679
600	34.656	3233.0	3614.2	6.8499	34.002	3231.7	3612.5	6.8401
625	35.882	3281.2	3675.9	6.9196	35.210	3280.0	3674.4	6.9099
$P = 11400$ kPa, $T^{\text{sat}} = 320.74$ °C								
Sat liq	1.504	1450.0	1467.2	3.4575				
Sat vap	15.284	2527.2	2701.5	5.5357				
340	17.622	2622.7	2823.6	5.7383				
360	19.495	2697.0	2919.3	5.8920				
380	21.079	2758.4	2998.7	6.0156				
400	22.492	2812.3	3068.7	6.1211				
425	24.104	2873.1	3147.9	6.2367				
450	25.599	2929.4	3221.2	6.3399				
475	27.010	2982.6	3290.5	6.4341				
500	28.359	3033.9	3357.2	6.5218				
525	29.661	3083.9	3422.1	6.6043				
550	30.925	3133.1	3485.7	6.6828				
575	32.160	3181.9	3548.5	6.7580				
600	33.370	3230.4	3610.8	6.8304				
625	34.560	3278.8	3672.8	6.9004				
650	35.733	3327.2	3734.6	6.9683				

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