



RS-52 (R428A)

THERMODYNAMIC TABLES

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Sat -60 C [0.51996 bar]				Sat -50 C [0.87956 bar]				Sat -40 C [1.4119 bar]				Sat -30 C [2.1671 bar]			
Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy
[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]
-60	308.11	314.07	1.5809	-50	188.29	320.11	1.5693	-40	120.53	326.00	1.5603	-30	80.263	331.85	1.5539
-58	311.33	315.49	1.5875	-48	190.25	321.59	1.5759	-38	121.86	327.63	1.5672	-28	81.176	333.56	1.5609
-56	314.53	316.91	1.5941	-46	192.20	323.07	1.5825	-36	123.13	329.17	1.5738	-26	82.040	335.18	1.5675
-54	317.73	318.34	1.6007	-44	194.15	324.56	1.5890	-34	124.38	330.72	1.5803	-24	82.898	336.80	1.5740
-52	320.91	319.77	1.6072	-42	196.09	326.05	1.5955	-32	125.64	332.28	1.5868	-22	83.750	338.43	1.5805
-50	324.09	321.21	1.6136	-40	198.02	327.55	1.6019	-30	126.88	333.84	1.5932	-20	84.597	340.05	1.5870
-48	327.26	322.66	1.6201	-38	199.95	329.05	1.6083	-28	128.12	335.40	1.5996	-18	85.438	341.68	1.5934
-46	330.43	324.11	1.6265	-36	201.87	330.55	1.6147	-26	129.36	336.97	1.6060	-16	86.275	343.31	1.5997
-44	333.58	325.56	1.6329	-34	203.78	332.06	1.6211	-24	130.59	338.54	1.6123	-14	87.108	344.94	1.6061
-42	336.73	327.03	1.6392	-32	205.69	333.58	1.6274	-22	131.81	340.11	1.6186	-12	87.936	346.58	1.6124
-40	339.87	328.49	1.6456	-30	207.59	335.10	1.6337	-20	133.03	341.69	1.6249	-10	88.761	348.22	1.6186
-38	343.01	329.97	1.6519	-28	209.48	336.63	1.6399	-18	134.25	343.27	1.6311	-8	89.581	349.87	1.6248
-36	346.14	331.45	1.6581	-26	211.38	338.16	1.6461	-16	135.46	344.86	1.6373	-6	90.398	351.52	1.6310
-34	349.26	332.94	1.6644	-24	213.26	339.70	1.6523	-14	136.67	346.46	1.6435	-4	91.211	353.17	1.6372
-32	352.38	334.43	1.6706	-22	215.15	341.25	1.6585	-12	137.87	348.06	1.6496	-2	92.021	354.83	1.6433
-30	355.49	335.93	1.6768	-20	217.02	342.80	1.6647	-10	139.07	349.66	1.6557	0	92.828	356.49	1.6494
-28	358.60	337.44	1.6830	-18	218.90	344.35	1.6708	-8	140.27	351.27	1.6618	2	93.631	358.15	1.6555
-26	361.70	338.95	1.6891	-16	220.77	345.92	1.6769	-6	141.46	352.88	1.6679	4	94.432	359.82	1.6615
-24	364.80	340.47	1.6952	-14	222.63	347.48	1.6830	-4	142.65	354.50	1.6739	6	95.230	361.50	1.6676
-22	367.90	341.99	1.7013	-12	224.50	349.06	1.6890	-2	143.84	356.13	1.6800	8	96.026	363.17	1.6736
-20	370.99	343.52	1.7074	-10	226.36	350.64	1.6950	0	145.03	357.76	1.6859	10	96.819	364.86	1.6795
-18	374.08	345.06	1.7135	-8	228.21	352.22	1.7010	2	146.21	359.39	1.6919	12	97.609	366.55	1.6855
-16	377.16	346.61	1.7195	-6	230.07	353.81	1.7070	4	147.39	361.04	1.6979	14	98.397	368.24	1.6914
-14	380.24	348.16	1.7255	-4	231.92	355.41	1.7130	6	148.56	362.68	1.7038	16	99.183	369.94	1.6973
-12	383.32	349.72	1.7315	-2	233.76	357.02	1.7189	8	149.74	364.34	1.7097	18	99.967	371.64	1.7032
-10	386.39	351.28	1.7375	0	235.61	358.63	1.7248	10	150.91	365.99	1.7156	20	100.750	373.35	1.7090
-8	389.46	352.85	1.7434	2	237.45	360.24	1.7307	12	152.08	367.66	1.7214	22	101.530	375.07	1.7148
-6	392.53	354.43	1.7493	4	239.29	361.87	1.7366	14	153.25	369.33	1.7273	24	102.310	376.79	1.7206
-4	395.59	356.02	1.7552	6	241.13	363.50	1.7425	16	154.41	371.01	1.7331	26	103.080	378.51	1.7264
-2	398.65	357.61	1.7611	8	242.96	365.13	1.7483	18	155.57	372.69	1.7389	28	103.860	380.24	1.7322
0	401.71	359.20	1.7670	10	244.80	366.77	1.7541	20	156.74	374.38	1.7446	30	104.630	381.98	1.7379
2	404.77	360.81	1.7729	12	246.63	368.42	1.7599	22	157.90	376.07	1.7504	32	105.400	383.72	1.7437
4	407.82	362.42	1.7787	14	248.46	370.08	1.7657	24	159.05	377.77	1.7561	34	106.170	385.47	1.7494
6	410.87	364.04	1.7845	16	250.28	371.74	1.7715	26	160.21	379.48	1.7619	36	106.940	387.22	1.7551
8	413.92	365.66	1.7903	18	252.11	373.41	1.7772	28	161.36	381.19	1.7676	38	107.710	388.98	1.7607
10	416.97	367.29	1.7961	20	253.93	375.08	1.7830	30	162.52	382.91	1.7733	40	108.470	390.74	1.7664
12	420.02	368.93	1.8018	22	255.75	376.76	1.7887	32	163.67	384.63	1.7789	42	109.240	392.51	1.7720
14	423.06	370.58	1.8076	24	257.57	378.45	1.7944	34	164.82	386.36	1.7846	44	110.000	394.29	1.7776

Temp	Volume	Enthalpy	Entropy		Temp	Volume	Enthalpy	Entropy		Temp	Volume	Enthalpy	Entropy		Temp	Volume	Enthalpy	Entropy
[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]		[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]		[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]		[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]
16	426.10	372.23	1.8133		26	259.39	380.14	1.8000		36	165.97	388.10	1.7902		46	110.76	396.07	1.7832
18	429.14	373.89	1.8190		28	261.20	381.84	1.8057		38	167.11	389.84	1.7958		48	111.52	397.86	1.7888
20	432.18	375.55	1.8247		30	263.02	383.55	1.8113		40	168.26	391.59	1.8014		50	112.28	399.65	1.7944
22	435.22	377.22	1.8304		32	264.83	385.26	1.8170		42	169.40	393.34	1.8070		52	113.04	401.45	1.7999
24	438.25	378.90	1.8361		34	266.64	386.98	1.8226		44	170.55	395.10	1.8126		54	113.80	403.25	1.8055
26	441.28	380.58	1.8417		36	268.45	388.70	1.8282		46	171.69	396.87	1.8181		56	114.55	405.06	1.8110
28	444.31	382.28	1.8474		38	270.26	390.43	1.8338		48	172.83	398.64	1.8237		58	115.31	406.88	1.8165
30	447.34	383.97	1.8530		40	272.07	392.17	1.8393		50	173.97	400.42	1.8292		60	116.06	408.70	1.8220
32	450.37	385.68	1.8586		42	273.88	393.92	1.8449		52	175.11	402.21	1.8347		62	116.82	410.53	1.8274
34	453.40	387.39	1.8642		44	275.68	395.67	1.8504		54	176.25	404.00	1.8402		64	117.57	412.36	1.8329
36	456.43	389.11	1.8698		46	277.49	397.43	1.8560		56	177.39	405.80	1.8457		66	118.32	414.20	1.8383
38	459.45	390.83	1.8753		48	279.29	399.19	1.8615		58	178.52	407.60	1.8511		68	119.07	416.05	1.8437
40	462.47	392.56	1.8809		50	281.10	400.96	1.8670		60	179.66	409.41	1.8566		70	119.82	417.91	1.8492
42	465.50	394.30	1.8864		52	282.90	402.74	1.8724		62	180.79	411.23	1.8620		72	120.57	419.76	1.8546
44	468.52	396.05	1.8919		54	284.70	404.52	1.8779		64	181.92	413.05	1.8675		74	121.32	421.62	1.8600
46	471.54	397.80	1.8974		56	286.50	406.31	1.8834		66	183.06	414.88	1.8729		76	122.06	423.49	1.8653
48	474.56	399.56	1.9029		58	288.29	408.11	1.8888		68	184.19	416.72	1.8783		78	122.81	425.37	1.8707
50	477.58	401.32	1.9084		60	290.09	409.91	1.8942		70	185.32	418.57	1.8836		80	123.56	427.25	1.8760
52	480.59	403.09	1.9139		62	291.89	411.72	1.8997		72	186.45	420.41	1.8890		82	124.30	429.13	1.8814
54	483.61	404.87	1.9193		64	293.69	413.53	1.9051		74	187.58	422.26	1.8944		84	125.05	431.03	1.8867
56	486.62	406.65	1.9247		66	295.48	415.36	1.9104		76	188.71	424.12	1.8997		86	125.79	432.93	1.8920
58	489.64	408.44	1.9302		68	297.27	417.19	1.9158		78	189.84	425.99	1.9050		88	126.54	434.83	1.8973
60	492.65	410.24	1.9356		70	299.07	419.03	1.9211		80	190.96	427.86	1.9104		90	127.28	436.74	1.9025
62	495.66	412.05	1.9410		72	300.86	420.86	1.9265		82	192.09	429.74	1.9157		92	128.02	438.66	1.9078
64	498.67	413.86	1.9464		74	302.65	422.71	1.9319		84	193.22	431.62	1.9210		94	128.76	440.58	1.9131
66	501.69	415.67	1.9517		76	304.44	424.56	1.9372		86	194.34	433.51	1.9262		96	129.51	442.51	1.9183
68	504.70	417.50	1.9571		78	306.23	426.42	1.9425		88	195.47	435.41	1.9315		98	130.25	444.45	1.9235
70	507.70	419.34	1.9624		80	308.03	428.29	1.9478		90	196.59	437.31	1.9368		100	130.99	446.39	1.9287
72	510.71	421.16	1.9678		82	309.81	430.16	1.9531		92	197.72	439.22	1.9420		102	131.73	448.34	1.9339
74	513.72	423.01	1.9731		84	311.60	432.04	1.9584		94	198.84	441.14	1.9472		104	132.47	450.29	1.9391
76	516.73	424.86	1.9784		86	313.39	433.92	1.9636		96	199.96	443.06	1.9525		106	133.20	452.25	1.9443
78	519.73	426.71	1.9837		88	315.18	435.81	1.9689		98	201.08	444.99	1.9577		108	133.94	454.21	1.9495
80	522.74	428.57	1.9890		90	316.97	437.71	1.9741		100	202.21	446.92	1.9629		110	134.68	456.18	1.9546
82	525.75	430.44	1.9943		92	318.75	439.62	1.9793		102	203.33	448.86	1.9680		112	135.42	458.16	1.9598
84	528.75	432.32	1.9996		94	320.54	441.53	1.9846		104	204.45	450.81	1.9732		114	136.16	460.14	1.9649
86	531.75	434.20	2.0048		96	322.32	443.44	1.9898		106	205.57	452.76	1.9784		116	136.89	462.13	1.9700
88	534.76	436.09	2.0100		98	324.11	445.37	1.9950		108	206.69	454.72	1.9835		118	137.63	464.12	1.9751
90	537.76	437.98	2.0153		100	325.89	447.30	2.0002		110	207.81	456.68	1.9887		120	138.36	466.12	1.9802

Sat -20 C [3.2006 bar]				Sat -10 C [4.5730 bar]				Sat 0 C [6.3491 bar]				Sat 10 C [8.5986 bar]			
Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy
[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]
-20	55.238	337.66	1.5497	-10	0.803	186.85	0.9515	0	28.142	348.39	1.5441	10	20.634	353.25	1.5421
-18	55.862	339.36	1.5564	-8	37.966	344.60	1.5496	2	28.509	350.29	1.5510	12	20.933	355.28	1.5493
-16	56.480	341.05	1.5630	-6	38.419	346.40	1.5564	4	28.869	352.18	1.5579	14	21.226	357.29	1.5563
-14	57.093	342.75	1.5696	-4	38.867	348.20	1.5631	6	29.224	354.06	1.5646	16	21.513	359.29	1.5633
-12	57.701	344.45	1.5761	-2	39.310	349.99	1.5697	8	29.575	355.94	1.5714	18	21.795	361.28	1.5701
-10	58.304	346.15	1.5826	0	39.748	351.78	1.5763	10	29.921	357.81	1.5780	20	22.073	363.26	1.5769
-8	58.902	347.85	1.5891	2	40.181	353.57	1.5828	12	30.263	359.68	1.5846	22	22.346	365.23	1.5836
-6	59.496	349.55	1.5955	4	40.611	355.35	1.5893	14	30.601	361.55	1.5911	24	22.616	367.20	1.5902
-4	60.086	351.25	1.6018	6	41.037	357.14	1.5957	16	30.936	363.41	1.5976	26	22.882	369.16	1.5968
-2	60.673	352.96	1.6081	8	41.459	358.93	1.6021	18	31.267	365.27	1.6040	28	23.145	371.11	1.6033
0	61.255	354.67	1.6144	10	41.877	360.72	1.6084	20	31.595	367.13	1.6103	30	23.404	373.07	1.6098
2	61.835	356.38	1.6206	12	42.293	362.50	1.6147	22	31.920	368.99	1.6167	32	23.661	375.01	1.6162
4	62.410	358.09	1.6268	14	42.705	364.29	1.6210	24	32.242	370.85	1.6229	34	23.915	376.96	1.6225
6	62.983	359.81	1.6330	16	43.115	366.08	1.6272	26	32.561	372.71	1.6292	36	24.166	378.90	1.6288
8	63.553	361.52	1.6391	18	43.521	367.88	1.6334	28	32.878	374.57	1.6354	38	24.414	380.84	1.6351
10	64.120	363.25	1.6452	20	43.925	369.67	1.6395	30	33.192	376.43	1.6415	40	24.661	382.78	1.6413
12	64.684	364.97	1.6513	22	44.327	371.46	1.6456	32	33.504	378.29	1.6476	42	24.905	384.72	1.6475
14	65.246	366.70	1.6573	24	44.726	373.26	1.6517	34	33.814	380.15	1.6537	44	25.146	386.65	1.6536
16	65.805	368.43	1.6634	26	45.123	375.06	1.6577	36	34.122	382.01	1.6598	46	25.386	388.59	1.6597
18	66.362	370.17	1.6693	28	45.518	376.87	1.6637	38	34.427	383.88	1.6658	48	25.624	390.53	1.6657
20	66.917	371.91	1.6753	30	45.910	378.67	1.6697	40	34.731	385.75	1.6718	50	25.861	392.47	1.6718
22	67.469	373.66	1.6812	32	46.301	380.48	1.6757	42	35.033	387.61	1.6777	52	26.095	394.40	1.6777
24	68.020	375.40	1.6871	34	46.690	382.29	1.6816	44	35.334	389.49	1.6836	54	26.328	396.34	1.6837
26	68.568	377.16	1.6930	36	47.077	384.11	1.6875	46	35.632	391.36	1.6895	56	26.559	398.28	1.6896
28	69.115	378.92	1.6989	38	47.462	385.93	1.6933	48	35.929	393.24	1.6954	58	26.789	400.23	1.6955
30	69.660	380.68	1.7047	40	47.846	387.75	1.6992	50	36.225	395.11	1.7012	60	27.018	402.17	1.7013
32	70.203	382.45	1.7105	42	48.228	389.58	1.7050	52	36.519	397.00	1.7070	62	27.245	404.11	1.7072
34	70.745	384.22	1.7163	44	48.608	391.41	1.7108	54	36.812	398.88	1.7128	64	27.470	406.06	1.7130
36	71.284	385.99	1.7221	46	48.987	393.24	1.7166	56	37.103	400.77	1.7186	66	27.695	408.01	1.7187
38	71.823	387.78	1.7278	48	49.365	395.08	1.7223	58	37.394	402.66	1.7243	68	27.917	409.97	1.7244
40	72.360	389.56	1.7335	50	49.741	396.93	1.7280	60	37.683	404.56	1.7300	70	28.138	411.92	1.7301
42	72.895	391.35	1.7392	52	50.116	398.77	1.7337	62	37.970	406.46	1.7357	72	28.361	413.88	1.7359
44	73.429	393.15	1.7449	54	50.490	400.62	1.7394	64	38.257	408.36	1.7413	74	28.581	415.84	1.7415
46	73.962	394.95	1.7506	56	50.863	402.48	1.7451	66	38.542	410.27	1.7470	76	28.800	417.80	1.7472
48	74.493	396.76	1.7562	58	51.234	404.34	1.7507	68	38.826	412.18	1.7526	78	29.018	419.77	1.7528
50	75.024	398.57	1.7619	60	51.604	406.21	1.7563	70	39.109	414.10	1.7582	80	29.235	421.74	1.7584
52	75.553	400.39	1.7675	62	51.974	408.07	1.7619	72	39.393	416.01	1.7638	82	29.452	423.72	1.7640
54	76.081	402.21	1.7731	64	52.342	409.95	1.7675	74	39.675	417.94	1.7693	84	29.667	425.69	1.7695

Sat -20 C [3.2006 bar]				Sat -10 C [4.5730 bar]				Sat 0 C [6.3491 bar]				Sat 10 C [8.5986 bar]			
Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy
[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]
56	76.608	404.04	1.7786	66	52.709	411.830	1.7730	76	39.955	419.86	1.7749	86	29.881	427.68	1.7750
58	77.134	405.87	1.7842	68	53.074	413.717	1.7785	78	40.235	421.80	1.7804	88	30.095	429.66	1.7806
60	77.659	407.71	1.7897	70	53.439	415.608	1.7841	80	40.514	423.73	1.7859	90	30.308	431.65	1.7861
62	78.182	409.55	1.7952	72	53.805	417.490	1.7896	82	40.793	425.67	1.7914	92	30.520	433.64	1.7915
64	78.705	411.40	1.8007	74	54.169	419.390	1.7951	84	41.070	427.62	1.7968	94	30.731	435.64	1.7970
66	79.227	413.26	1.8062	76	54.532	421.300	1.8005	86	41.347	429.57	1.8023	96	30.942	437.64	1.8024
68	79.747	415.13	1.8117	78	54.894	423.210	1.8060	88	41.623	431.52	1.8077	98	31.152	439.64	1.8078
70	80.267	416.99	1.8171	80	55.255	425.120	1.8114	90	41.898	433.48	1.8131	100	31.362	441.65	1.8132
72	80.788	418.86	1.8226	82	55.615	427.040	1.8168	92	42.172	435.45	1.8185	102	31.570	443.67	1.8186
74	81.307	420.73	1.8280	84	55.975	428.960	1.8223	94	42.446	437.41	1.8239	104	31.779	445.68	1.8240
76	81.825	422.62	1.8334	86	56.334	430.890	1.8276	96	42.720	439.39	1.8292	106	31.986	447.71	1.8293
78	82.342	424.50	1.8388	88	56.693	432.830	1.8330	98	42.992	441.37	1.8346	108	32.193	449.73	1.8346
80	82.858	426.40	1.8442	90	57.050	434.770	1.8384	100	43.264	443.35	1.8399	110	32.400	451.76	1.8400
82	83.374	428.30	1.8495	92	57.408	436.710	1.8437	102	43.536	445.34	1.8452	112	32.606	453.80	1.8453
84	83.889	430.20	1.8549	94	57.764	438.660	1.8490	104	43.807	447.33	1.8505	114	32.811	455.84	1.8505
86	84.404	432.11	1.8602	96	58.120	440.620	1.8543	106	44.077	449.33	1.8558	116	33.016	457.88	1.8558
88	84.917	434.03	1.8656	98	58.475	442.580	1.8596	108	44.347	451.33	1.8611	118	33.220	459.93	1.8611
90	85.431	435.95	1.8709	100	58.830	444.540	1.8649	110	44.616	453.34	1.8663	120	33.424	461.98	1.8663
92	85.943	437.88	1.8762	102	59.184	446.520	1.8702	112	44.885	455.35	1.8716	122	33.628	464.04	1.8715
94	86.455	439.82	1.8814	104	59.538	448.490	1.8754	114	45.154	457.37	1.8768	124	33.831	466.11	1.8767
96	86.967	441.75	1.8867	106	59.891	450.470	1.8807	116	45.422	459.40	1.8820	126	34.034	468.17	1.8819
98	87.477	443.70	1.8920	108	60.244	452.460	1.8859	118	45.689	461.43	1.8872	128	34.236	470.25	1.8871
100	87.988	445.65	1.8972	110	60.596	454.460	1.8911	120	45.956	463.46	1.8924	130	34.438	472.32	1.8923
102	88.498	447.61	1.9024	112	60.947	456.450	1.8963	122	46.223	465.50	1.8976	132	34.639	474.40	1.8974
104	89.007	449.57	1.9077	114	61.299	458.460	1.9015	124	46.489	467.54	1.9027	134	34.840	476.49	1.9026
106	89.516	451.54	1.9129	116	61.649	460.470	1.9067	126	46.755	469.59	1.9079	136	35.041	478.58	1.9077
108	90.024	453.51	1.9180	118	62.000	462.480	1.9119	128	47.020	471.65	1.9130	138	35.241	480.68	1.9128
110	90.532	455.49	1.9232	120	62.350	464.500	1.9170	130	47.285	473.70	1.9181	140	35.441	482.78	1.9179
112	91.039	457.48	1.9284	122	62.699	466.530	1.9222	132	47.549	475.77	1.9232	142	35.640	484.89	1.9230
114	91.546	459.47	1.9336	124	63.048	468.560	1.9273	134	47.814	477.84	1.9283	144	35.840	487.00	1.9280
116	92.053	461.46	1.9387	126	63.397	470.600	1.9324	136	48.078	479.91	1.9334	146	36.038	489.11	1.9331
118	92.559	463.47	1.9438	128	63.745	472.640	1.9375	138	48.341	481.99	1.9385	148	36.237	491.24	1.9382
120	93.065	465.47	1.9489	130	64.093	474.680	1.9426	140	48.604	484.08	1.9436	150	36.435	493.36	1.9432
122	93.570	467.49	1.9541	132	64.441	476.740	1.9477	142	48.867	486.17	1.9486	152	36.633	495.49	1.9482
124	94.075	469.51	1.9592	134	64.788	478.800	1.9527	144	49.130	488.27	1.9536	154	36.831	497.63	1.9532
126	94.580	471.53	1.9642	136	65.135	480.860	1.9578	146	49.392	490.37	1.9587	156	37.028	499.77	1.9582
128	95.084	473.56	1.9693	138	65.482	482.930	1.9628	148	49.654	492.48	1.9637	158	37.225	501.92	1.9632
130	95.588	475.60	1.9744	140	65.828	485.000	1.9679	150	49.916	494.59	1.9687	160	37.422	504.07	1.9682

Sat 30 C [14.827 bar]				Sat 40 C [18.983 bar]				Sat 50 C [23.981 bar]			
Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy
[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]
30	11.402	361.20	1.5369	40	8.486	363.87	1.5323	50	6.212	364.66	1.5234
32	11.635	363.68	1.5451	42	8.704	366.62	1.5411	52	6.445	368.10	1.5340
34	11.855	366.05	1.5528	44	8.910	369.29	1.5496	54	6.654	371.28	1.5438
36	12.067	368.38	1.5604	46	9.106	371.89	1.5577	56	6.848	374.31	1.5530
38	12.273	370.68	1.5678	48	9.294	374.44	1.5657	58	7.030	377.22	1.5618
40	12.473	372.96	1.5751	50	9.475	376.93	1.5734	60	7.202	380.03	1.5703
42	12.669	375.21	1.5823	52	9.650	379.38	1.5810	62	7.365	382.77	1.5785
44	12.859	377.43	1.5893	54	9.820	381.80	1.5884	64	7.522	385.44	1.5864
46	13.046	379.65	1.5963	56	9.984	384.18	1.5957	66	7.672	388.06	1.5942
48	13.229	381.84	1.6031	58	10.145	386.54	1.6028	68	7.817	390.63	1.6017
50	13.408	384.02	1.6099	60	10.301	388.88	1.6098	70	7.958	393.16	1.6091
52	13.584	386.19	1.6166	62	10.453	391.19	1.6167	72	8.094	395.65	1.6164
54	13.757	388.34	1.6232	64	10.603	393.48	1.6236	74	8.226	398.12	1.6235
56	13.927	390.49	1.6297	66	10.749	395.76	1.6303	76	8.355	400.55	1.6305
58	14.095	392.63	1.6362	68	10.893	398.02	1.6370	78	8.481	402.97	1.6374
60	14.260	394.76	1.6426	70	11.033	400.27	1.6435	80	8.605	405.36	1.6442
62	14.423	396.88	1.6490	72	11.172	402.51	1.6500	82	8.725	407.73	1.6509
64	14.584	399.00	1.6553	74	11.308	404.73	1.6565	84	8.843	410.09	1.6575
66	14.743	401.11	1.6615	76	11.443	406.95	1.6628	86	8.960	412.43	1.6640
68	14.900	403.21	1.6677	78	11.575	409.16	1.6691	88	9.074	414.76	1.6705
70	15.055	405.32	1.6738	80	11.706	411.36	1.6754	90	9.186	417.07	1.6769
72	15.209	407.42	1.6799	82	11.835	413.55	1.6816	92	9.296	419.38	1.6832
74	15.361	409.51	1.6860	84	11.962	415.74	1.6877	94	9.405	421.67	1.6895
76	15.511	411.61	1.6920	86	12.088	417.93	1.6938	96	9.512	423.96	1.6957
78	15.660	413.70	1.6980	88	12.212	420.11	1.6999	98	9.618	426.24	1.7019
80	15.808	415.79	1.7039	90	12.335	422.28	1.7059	100	9.722	428.51	1.7080
82	15.955	417.88	1.7098	92	12.457	424.46	1.7119	102	9.826	430.77	1.7140
84	16.100	419.97	1.7157	94	12.577	426.62	1.7178	104	9.928	433.03	1.7200
86	16.244	422.06	1.7215	96	12.697	428.79	1.7237	106	10.028	435.29	1.7260
88	16.387	424.14	1.7273	98	12.815	430.96	1.7295	108	10.128	437.54	1.7319
90	16.529	426.23	1.7331	100	12.932	433.12	1.7353	110	10.227	439.79	1.7378
92	16.670	428.32	1.7388	102	13.049	435.29	1.7411	112	10.325	442.03	1.7436
94	16.810	430.41	1.7445	104	13.164	437.45	1.7469	114	10.421	444.27	1.7494
96	16.949	432.50	1.7502	106	13.279	439.61	1.7526	116	10.517	446.51	1.7552
98	17.087	434.59	1.7559	108	13.392	441.77	1.7583	118	10.612	448.75	1.7609
100	17.224	436.69	1.7615	110	13.505	443.93	1.7639	120	10.707	450.99	1.7666
102	17.361	438.78	1.7671	112	13.617	446.10	1.7696	122	10.800	453.22	1.7723
104	17.496	440.88	1.7727	114	13.728	448.26	1.7752	124	10.893	455.45	1.7780

Temp [C]	Volume [litre/kg]	Enthalpy [kJ/kg]	Entropy [kJ/K-kg]		Temp [C]	Volume [litre/kg]	Enthalpy [kJ/kg]	Entropy [kJ/K-kg]		Temp [C]	Volume [litre/kg]	Enthalpy [kJ/kg]	Entropy [kJ/K-kg]
106	17.631	442.98	1.7782		116	13.839	450.42	1.7807		126	10.985	457.69	1.7836
108	17.766	445.08	1.7837		118	13.949	452.59	1.7863		128	11.076	459.92	1.7891
110	17.899	447.18	1.7892		120	14.058	454.75	1.7918		130	11.167	462.16	1.7947
112	18.032	449.29	1.7947		122	14.166	456.92	1.7973		132	11.257	464.39	1.8002
114	18.164	451.40	1.8002		124	14.274	459.09	1.8028		134	11.347	466.62	1.8057
116	18.296	453.51	1.8056		126	14.381	461.26	1.8082		136	11.436	468.86	1.8112
118	18.427	455.62	1.8110		128	14.488	463.43	1.8137		138	11.524	471.09	1.8167
120	18.557	457.74	1.8164		130	14.594	465.61	1.8191		140	11.612	473.33	1.8221
122	18.687	459.86	1.8218		132	14.700	467.78	1.8244		142	11.699	475.57	1.8275
124	18.817	461.98	1.8272		134	14.805	469.96	1.8298		144	11.786	477.81	1.8329
126	18.945	464.10	1.8325		136	14.910	472.14	1.8352		146	11.873	480.05	1.8382
128	19.074	466.23	1.8378		138	15.014	474.33	1.8405		148	11.959	482.29	1.8436
130	19.202	468.36	1.8431		140	15.118	476.52	1.8458		150	12.044	484.54	1.8489
132	19.329	470.50	1.8484		142	15.221	478.70	1.8511		152	12.129	486.78	1.8542
134	19.456	472.64	1.8537		144	15.324	480.90	1.8563		154	12.214	489.03	1.8595
136	19.582	474.78	1.8589		146	15.426	483.09	1.8616		156	12.298	491.28	1.8647
138	19.708	476.93	1.8642		148	15.528	485.29	1.8668		158	12.382	493.54	1.8700
140	19.834	479.08	1.8694		150	15.630	487.49	1.8720		160	12.465	495.79	1.8752
142	19.959	481.23	1.8746		152	15.731	489.70	1.8772		162	12.549	498.05	1.8804
144	20.084	483.39	1.8798		154	15.832	491.91	1.8824		164	12.631	500.31	1.8856
146	20.208	485.55	1.8849		156	15.932	494.12	1.8876		166	12.714	502.58	1.8907
148	20.333	487.72	1.8901		158	16.032	496.33	1.8927		168	12.796	504.84	1.8959
150	20.456	489.88	1.8952		160	16.132	498.55	1.8979		170	12.878	507.11	1.9010
152	20.580	492.06	1.9003		162	16.232	500.77	1.9030		172	12.959	509.39	1.9061
154	20.703	494.23	1.9055		164	16.331	503.00	1.9081		174	13.040	511.66	1.9112
156	20.825	496.42	1.9105		166	16.430	505.23	1.9132		176	13.121	513.94	1.9163
158	20.948	498.60	1.9156		168	16.528	507.46	1.9182		178	13.202	516.22	1.9214
160	21.070	500.79	1.9207		170	16.626	509.69	1.9233		180	13.282	518.51	1.9264
162	21.192	502.99	1.9257		172	16.724	511.93	1.9283		182	13.362	520.80	1.9315
164	21.313	505.18	1.9308		174	16.822	514.18	1.9334		184	13.442	523.09	1.9365
166	21.434	507.39	1.9358		176	16.920	516.43	1.9384		186	13.522	525.38	1.9415
168	21.555	509.59	1.9408		178	17.017	518.68	1.9434		188	13.601	527.68	1.9465
170	21.676	511.80	1.9458		180	17.114	520.93	1.9484		190	13.680	529.98	1.9515
172	21.796	514.02	1.9508		182	17.210	523.19	1.9534		192	13.759	532.29	1.9564
174	21.917	516.24	1.9558		184	17.307	525.46	1.9583		194	13.838	534.60	1.9614
176	22.036	518.46	1.9608		186	17.403	527.72	1.9633		196	13.916	536.91	1.9663
178	22.156	520.69	1.9657		188	17.499	530.00	1.9682		198	13.994	539.23	1.9713
180	22.275	522.92	1.9706		190	17.595	532.27	1.9731		200	14.072	541.55	1.9762

Sat 60 C [29.980 bar]					Sat 70 C [38.689 bar]			
Temp	Volume	Enthalpy	Entropy		Temp	Volume	Enthalpy	Entropy
[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]		[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]
60	4.329	361.86	1.5054		70	1.447	317.81	1.3686
62	4.628	366.93	1.5206		72	2.186	342.79	1.4411
64	4.871	371.21	1.5333		74	2.870	359.24	1.4887
66	5.081	375.04	1.5446		76	3.218	367.18	1.5115
68	5.270	378.57	1.5550		78	3.473	373.03	1.5282
70	5.442	381.90	1.5647		80	3.681	377.93	1.5421
72	5.602	385.07	1.5739		82	3.861	382.27	1.5544
74	5.752	388.11	1.5827		84	4.022	386.23	1.5655
76	5.895	391.05	1.5912		86	4.169	389.92	1.5758
78	6.030	393.91	1.5993		88	4.305	393.41	1.5855
80	6.160	396.70	1.6073		90	4.432	396.74	1.5947
82	6.284	399.44	1.6150		92	4.552	399.95	1.6035
84	6.405	402.12	1.6225		94	4.666	403.05	1.6120
86	6.521	404.76	1.6299		96	4.775	406.06	1.6201
88	6.634	407.36	1.6371		98	4.880	409.00	1.6281
90	6.744	409.92	1.6442		100	4.980	411.88	1.6358
92	6.851	412.46	1.6512		102	5.078	414.70	1.6434
94	6.956	414.97	1.6580		104	5.172	417.48	1.6507
96	7.058	417.46	1.6648		106	5.263	420.21	1.6580
98	7.158	419.93	1.6714		108	5.352	422.91	1.6651
100	7.256	422.38	1.6780		110	5.439	425.57	1.6720
102	7.352	424.81	1.6845		112	5.523	428.21	1.6789
104	7.446	427.22	1.6909		114	5.606	430.82	1.6857
106	7.539	429.63	1.6973		116	5.687	433.40	1.6923
108	7.631	432.02	1.7036		118	5.766	435.96	1.6989
110	7.721	434.40	1.7098		120	5.844	438.51	1.7054
112	7.809	436.77	1.7160		122	5.920	441.04	1.7118
114	7.897	439.13	1.7221		124	5.995	443.55	1.7181
116	7.983	441.48	1.7282		126	6.069	446.05	1.7244
118	8.069	443.83	1.7342		128	6.142	448.53	1.7306
120	8.153	446.17	1.7401		130	6.214	451.01	1.7368
122	8.236	448.51	1.7461		132	6.284	453.47	1.7429
124	8.319	450.84	1.7520		134	6.354	455.93	1.7489
126	8.400	453.16	1.7578		136	6.423	458.37	1.7549
128	8.481	455.48	1.7636		138	6.491	460.81	1.7608
130	8.561	457.80	1.7694		140	6.558	463.24	1.7667
132	8.640	460.11	1.7751		142	6.625	465.67	1.7726
134	8.718	462.43	1.7808		144	6.691	468.09	1.7784

Sat 60 C [29.980 bar]				Sat 70 C [38.689 bar]			
Temp	Volume	Enthalpy	Entropy	Temp	Volume	Enthalpy	Entropy
[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]	[C]	[litre/kg]	[kJ/kg]	[kJ/K-kg]
136	8.796	464.74	1.7864	146	6.756	470.50	1.7842
138	8.873	467.04	1.7921	148	6.820	472.91	1.7899
140	8.950	469.35	1.7977	150	6.884	475.31	1.7956
142	9.026	471.66	1.8032	152	6.947	477.72	1.8013
144	9.101	473.96	1.8088	154	7.010	480.12	1.8069
146	9.176	476.26	1.8143	156	7.072	482.51	1.8125
148	9.250	478.57	1.8198	158	7.133	484.90	1.8181
150	9.323	480.87	1.8252	160	7.194	487.30	1.8236
152	9.397	483.18	1.8306	162	7.255	489.69	1.8291
154	9.469	485.48	1.8361	164	7.315	492.07	1.8346
156	9.542	487.79	1.8414	166	7.374	494.46	1.8400
158	9.614	490.09	1.8468	168	7.434	496.85	1.8455
160	9.685	492.40	1.8521	170	7.493	499.24	1.8509
162	9.756	494.70	1.8575	172	7.551	501.62	1.8562
164	9.827	497.01	1.8627	174	7.609	504.01	1.8616
166	9.897	499.32	1.8680	176	7.667	506.39	1.8669
168	9.967	501.64	1.8733	178	7.724	508.78	1.8722
170	10.036	503.95	1.8785	180	7.781	511.16	1.8775
172	10.106	506.27	1.8837	182	7.838	513.55	1.8827
174	10.174	508.58	1.8889	184	7.894	515.94	1.8880
176	10.243	510.90	1.8941	186	7.950	518.33	1.8932
178	10.311	513.22	1.8992	188	8.005	520.72	1.8984
180	10.379	515.55	1.9044	190	8.061	523.11	1.9035
182	10.447	517.87	1.9095	192	8.116	525.50	1.9087
184	10.514	520.20	1.9146	194	8.171	527.90	1.9138
186	10.581	522.53	1.9197	196	8.225	530.29	1.9190
188	10.648	524.87	1.9248	198	8.280	532.69	1.9241
190	10.714	527.20	1.9298	200	8.334	535.09	1.9291
192	10.781	529.54	1.9349	202	8.388	537.49	1.9342
194	10.847	531.88	1.9399	204	8.441	539.89	1.9392
196	10.913	534.23	1.9449	206	8.495	542.30	1.9443
198	10.978	536.58	1.9499	208	8.548	544.71	1.9493
200	11.043	538.93	1.9549	210	8.601	547.12	1.9543
202	11.109	541.28	1.9598	212	8.653	549.53	1.9593
204	11.173	543.64	1.9648	214	8.706	551.94	1.9642
206	11.238	546.00	1.9697	216	8.758	554.36	1.9692
208	11.303	548.36	1.9746	218	8.810	556.78	1.9741
210	11.367	550.73	1.9796	220	8.862	559.20	1.9790

Temp [C]	Pressure (L) [bara] bubble	Pressure (V) [bara] dew	Density (L) [kg/m ³] bubble	Density (V) [kg/m ³] dew	Volume (L) [litre/kg] bubble	Volume (V) [litre/kg] dew	Enthalpy (L) [kJ/kg] bubble	Enthalpy (V) [kJ/kg] dew	Entropy (L) [kJ/K-kg] bubble	Entropy (V) [kJ/K-kg] dew
-60	-0.448	-0.480	1417.500	3.246	0.705	0.308	125.790	314.070	0.696	1.581
-58	-0.385	-0.420	1411.200	3.597	0.709	0.278	128.110	315.280	0.707	1.578
-56	-0.317	-0.354	1404.900	3.977	0.712	0.251	130.440	316.490	0.718	1.576
-54	-0.243	-0.282	1398.600	4.388	0.715	0.228	132.790	317.700	0.728	1.574
-52	-0.162	-0.205	1392.200	4.832	0.718	0.207	135.130	318.910	0.739	1.571
-50	-0.075	-0.120	1385.800	5.311	0.722	0.188	137.490	320.110	0.749	1.569
-48	0.020	-0.029	1379.300	5.826	0.725	0.172	139.860	321.310	0.760	1.567
-46	0.121	0.069	1372.800	6.380	0.728	0.157	142.240	322.510	0.770	1.566
-44	0.231	0.175	1366.300	6.974	0.732	0.143	144.620	323.700	0.781	1.564
-42	0.348	0.289	1359.700	7.611	0.735	0.131	147.020	324.900	0.791	1.562
-40	0.475	0.412	1353.000	8.293	0.739	0.121	149.420	326.080	0.802	1.561
-38	0.610	0.543	1346.300	9.021	0.743	0.111	151.840	327.270	0.812	1.559
-36	0.755	0.684	1339.600	9.799	0.746	0.102	154.260	328.440	0.822	1.558
-34	0.910	0.835	1332.800	10.628	0.750	0.094	156.700	329.620	0.832	1.557
-32	1.075	0.996	1325.900	11.512	0.754	0.087	159.150	330.780	0.842	1.555
-30	1.251	1.167	1319.000	12.452	0.758	0.080	161.600	331.950	0.853	1.554
-28	1.438	1.350	1312.000	13.452	0.762	0.074	164.070	333.100	0.863	1.553
-26	1.637	1.544	1305.000	14.514	0.766	0.069	166.550	334.250	0.873	1.552
-24	1.848	1.750	1297.900	15.641	0.770	0.064	169.040	335.400	0.883	1.551
-22	2.072	1.969	1290.700	16.837	0.775	0.059	171.550	336.530	0.893	1.551
-20	2.309	2.201	1283.500	18.104	0.779	0.055	174.070	337.660	0.902	1.550
-18	2.559	2.446	1276.200	19.445	0.784	0.051	176.600	338.780	0.912	1.549
-16	2.824	2.705	1268.800	20.866	0.788	0.048	179.140	339.890	0.922	1.548
-14	3.104	2.979	1261.300	22.368	0.793	0.045	181.690	340.990	0.932	1.548
-12	3.399	3.268	1253.700	23.955	0.798	0.042	184.260	342.080	0.942	1.547
-10	3.709	3.573	1246.000	25.633	0.803	0.039	186.850	343.160	0.952	1.547
-8	4.036	3.894	1238.300	27.405	0.808	0.036	189.450	344.230	0.961	1.546
-6	4.379	4.231	1230.400	29.276	0.813	0.034	192.060	345.290	0.971	1.546
-4	4.740	4.586	1222.500	31.251	0.818	0.032	194.690	346.340	0.981	1.545
-2	5.119	4.958	1214.400	33.335	0.823	0.030	197.340	347.370	0.990	1.545
0	5.516	5.349	1206.200	35.533	0.829	0.028	200.000	348.390	1.000	1.544
2	5.932	5.759	1197.900	37.851	0.835	0.026	202.680	349.400	1.010	1.544
4	6.368	6.188	1189.500	40.296	0.841	0.025	205.380	350.390	1.019	1.543

Temp [C]	Pressure (L) [bara] bubble	Pressure (V) [bara] dew	Density (L) [kg/m ³] bubble	Density (V) [kg/m ³] dew	Volume (L) [litre/kg] bubble	Volume (V) [litre/kg] dew	Enthalpy (L) [kJ/kg] bubble	Enthalpy (V) [kJ/kg] dew	Entropy (L) [kJ/K-kg] bubble	Entropy (V) [kJ/K-kg] dew
6	6.824	6.637	1180.900	42.874	0.847	0.023	208.090	351.360	1.029	1.543
8	7.300	7.107	1172.200	45.593	0.853	0.022	210.830	352.320	1.039	1.543
10	7.798	7.599	1163.300	48.460	0.860	0.021	213.580	353.250	1.048	1.542
12	8.318	8.112	1154.300	51.485	0.866	0.019	216.360	354.170	1.058	1.542
14	8.861	8.648	1145.100	54.676	0.873	0.018	219.160	355.070	1.067	1.541
16	9.426	9.207	1135.700	58.044	0.881	0.017	221.970	355.940	1.077	1.541
18	10.016	9.789	1126.200	61.599	0.888	0.016	224.820	356.790	1.087	1.541
20	10.629	10.397	1116.400	65.354	0.896	0.015	227.690	357.610	1.096	1.540
22	11.269	11.029	1106.400	69.323	0.904	0.014	230.580	358.410	1.106	1.540
24	11.933	11.688	1096.200	73.520	0.912	0.014	233.500	359.180	1.116	1.539
26	12.625	12.373	1085.700	77.962	0.921	0.013	236.450	359.910	1.125	1.539
28	13.344	13.086	1075.000	82.667	0.930	0.012	239.430	360.610	1.135	1.538
30	14.090	13.827	1064.000	87.657	0.940	0.011	242.440	361.270	1.145	1.537
32	14.866	14.597	1052.600	92.956	0.950	0.011	245.490	361.890	1.154	1.536
34	15.670	15.396	1040.900	98.590	0.961	0.010	248.580	362.460	1.164	1.536
36	16.506	16.227	1028.900	104.590	0.972	0.010	251.700	362.990	1.174	1.535
38	17.372	17.089	1016.400	110.990	0.984	0.009	254.870	363.460	1.184	1.534
40	18.270	17.983	1003.500	117.840	0.996	0.008	258.080	363.870	1.194	1.532
42	19.202	18.911	990.090	125.180	1.010	0.008	261.340	364.210	1.204	1.531
44	20.167	19.874	976.110	133.080	1.024	0.008	264.670	364.480	1.214	1.530
46	21.167	20.872	961.490	141.610	1.040	0.007	268.050	364.660	1.225	1.528
48	22.204	21.907	946.130	150.850	1.057	0.007	271.500	364.740	1.235	1.526
50	23.277	22.981	929.930	160.920	1.075	0.006	275.040	364.710	1.246	1.524
52	24.389	24.094	912.730	171.960	1.096	0.006	278.670	364.540	1.257	1.521
54	25.541	25.248	894.340	184.160	1.118	0.005	282.410	364.220	1.268	1.518
56	26.733	26.446	874.480	197.790	1.144	0.005	286.290	363.700	1.279	1.515
58	27.969	27.689	852.760	213.220	1.173	0.005	290.330	362.940	1.291	1.510
60	29.250	28.980	828.570	231.010	1.207	0.004	294.590	361.860	1.303	1.505
62	30.578	30.322	800.930	252.110	1.249	0.004	299.160	360.340	1.316	1.499
64	31.955	31.720	768.000	278.230	1.302	0.004	304.200	358.170	1.331	1.491
66	33.385	33.182	725.580	313.320	1.378	0.003	310.080	354.850	1.348	1.480