

3. Standard Vertical Short Tube Evaporator (Calandria Evaporator)

Appendix A1

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Thermodynamic Properties of Water

	P MPa	T C	V m ³ /kg	H kJ/kg	S kJ/kg-K
Liquid	.10000E-1	45.8161	.10103E-2	191.102	.646602
Vapor	.10000E-1	45.8161	14.6725	2582.94	8.14533
Liquid	.12000E-1	49.4294	.10119E-2	206.209	.693691
Vapor	.12000E-1	49.4294	12.3604	2589.36	8.08150
Liquid	.14000E-1	52.5584	.10134E-2	219.293	.734051
Vapor	.14000E-1	52.5584	10.6932	2594.90	8.02772
Liquid	.16000E-1	55.3255	.10147E-2	230.867	.769428
Vapor	.16000E-1	55.3255	9.43244	2599.78	7.98128
Liquid	.18000E-1	57.8114	.10160E-2	241.267	.800963
Vapor	.18000E-1	57.8114	8.44478	2604.15	7.94041
Liquid	.20000E-1	60.0719	.10172E-2	250.725	.829439
Vapor	.20000E-1	60.0719	7.64954	2608.11	7.90395
Liquid	.22000E-1	62.1475	.10183E-2	259.412	.855422
Vapor	.22000E-1	62.1475	6.99507	2611.73	7.87102
Liquid	.24000E-1	64.0684	.10193E-2	267.453	.879330
Vapor	.24000E-1	64.0684	6.44675	2615.07	7.84103
Liquid	.26000E-1	65.8578	.10203E-2	274.946	.901484
Vapor	.26000E-1	65.8578	5.96051	2618.17	7.81348
Liquid	.28000E-1	67.5341	.10213E-2	281.967	.922136
Vapor	.28000E-1	67.5341	5.57904	2621.06	7.78801
Liquid	.30000E-1	69.1119	.10222E-2	288.576	.941486
Vapor	.30000E-1	69.1119	5.22962	2623.78	7.76434
Liquid	.32000E-1	70.6031	.10231E-2	294.824	.959695
Vapor	.32000E-1	70.6031	4.92265	2626.34	7.74222
Liquid	.34000E-1	72.0174	.10240E-2	300.751	.976896
Vapor	.34000E-1	72.0174	4.65078	2628.76	7.72148
Liquid	.36000E-1	73.3632	.10248E-2	306.392	.993202
Vapor	.36000E-1	73.3632	4.40826	2631.06	7.70194
Liquid	.38000E-1	74.6473	.10256E-2	311.776	1.00870
Vapor	.38000E-1	74.6473	4.19053	2633.24	7.68348
Liquid	.40000E-1	75.8757	.10264E-2	316.927	1.02348
Vapor	.40000E-1	75.8757	3.99395	2635.33	7.66598
Liquid	.42000E-1	77.0534	.10271E-2	321.867	1.03761
Vapor	.42000E-1	77.0534	3.81555	2637.32	7.64935
Liquid	.44000E-1	78.1848	.10279E-2	326.614	1.05113
Vapor	.44000E-1	78.1848	3.65289	2639.23	7.63352
Liquid	.46000E-1	79.2737	.10286E-2	331.183	1.06411
Vapor	.46000E-1	79.2737	3.50397	2641.07	7.61839
Liquid	.48000E-1	80.3236	.10293E-2	335.590	1.07659
Vapor	.48000E-1	80.3236	3.36709	2642.83	7.60393
Liquid	.50000E-1	81.3374	.10299E-2	339.845	1.08861
Vapor	.50000E-1	81.3374	3.24083	2644.53	7.59007
Liquid	.52000E-1	82.3177	.10306E-2	343.962	1.10020
Vapor	.52000E-1	82.3177	3.12400	2646.17	7.57676
Liquid	.54000E-1	83.2669	.10312E-2	347.948	1.11139
Vapor	.54000E-1	83.2669	3.01557	2647.75	7.56396
Liquid	.56000E-1	84.1871	.10319E-2	351.813	1.12222
Vapor	.56000E-1	84.1871	2.91465	2649.28	7.55163
Liquid	.58000E-1	85.0802	.10325E-2	355.565	1.13270
Vapor	.58000E-1	85.0802	2.82048	2650.76	7.53975

Thermodynamic Properties of Water

	P MPa	T C	V m ³ /kg	H kJ/kg	S kJ/kg-K
Liquid	.60000E-1	85.9479	.10331E-2	359.211	1.14286
Vapor	.60000E-1	85.9479	2.73240	2652.20	7.52827
Liquid	.70000E-1	89.9548	.10359E-2	376.058	1.18948
Vapor	.70000E-1	89.9548	2.36538	2658.79	7.47618
Liquid	.80000E-1	93.5096	.10385E-2	391.018	1.23046
Vapor	.80000E-1	93.5096	2.08760	2664.57	7.43116
Liquid	.90000E-1	96.7121	.10409E-2	404.508	1.26706
Vapor	.90000E-1	96.7121	1.86981	2669.72	7.39153
Liquid	.10000	99.6316	.10432E-2	416.817	1.30018
Vapor	.10000	99.6316	1.69432	2674.37	7.35614
Liquid	.110000	102.319	.10453E-2	428.154	1.33046
Vapor	.110000	102.319	1.54981	2678.60	7.32416
Liquid	.120000	104.810	.10473E-2	438.678	1.35836
Vapor	.120000	104.810	1.42867	2682.49	7.29501
Liquid	.130000	107.137	.10492E-2	448.509	1.38427
Vapor	.130000	107.137	1.32561	2686.09	7.26821
Liquid	.140000	109.320	.10510E-2	457.743	1.40845
Vapor	.140000	109.320	1.23682	2689.44	7.24342
Liquid	.150000	111.378	.10527E-2	466.455	1.43114
Vapor	.150000	111.378	1.15951	2692.57	7.22035
Liquid	.160000	113.326	.10544E-2	474.709	1.45252
Vapor	.160000	113.326	1.09156	2695.50	7.19879
Liquid	.170000	115.177	.10560E-2	482.555	1.47275
Vapor	.170000	115.177	1.03136	2698.27	7.17854
Liquid	.180000	116.941	.10576E-2	490.037	1.49195
Vapor	.180000	116.941	.977638	2700.88	7.15946
Liquid	.190000	118.626	.10591E-2	497.192	1.51022
Vapor	.190000	118.626	.929392	2703.36	7.14141
Liquid	.200000	120.240	.10605E-2	504.049	1.52266
Vapor	.200000	120.240	.885816	2705.71	7.12435
Liquid	.210000	121.790	.10619E-2	510.636	1.54435
Vapor	.210000	121.790	.846259	2707.95	7.110801
Liquid	.220000	123.280	.10633E-2	516.977	1.56034
Vapor	.220000	123.280	.810182	2710.09	7.09249
Liquid	.230000	124.716	.10646E-2	523.090	1.57571
Vapor	.230000	124.716	.777141	2712.13	7.07766
Liquid	.240000	126.103	.10659E-2	528.995	1.59050
Vapor	.240000	126.103	.746764	2714.09	7.06347
Liquid	.250000	127.443	.10672E-2	534.707	1.60475
Vapor	.250000	127.443	.718739	2715.97	7.04985
Liquid	.260000	128.740	.10685E-2	540.239	1.61851
Vapor	.260000	128.740	.692799	2717.78	7.03676
Liquid	.270000	129.997	.10697E-2	545.604	1.63182
Vapor	.270000	129.997	.668718	2719.51	7.02417
Liquid	.280000	131.217	.10709E-2	550.813	1.64469
Vapor	.280000	131.217	.646300	2721.19	7.01203
Liquid	.290000	132.402	.10720E-2	555.877	1.65717
Vapor	.290000	132.402	.625378	2722.80	7.00032
Liquid	.300000	133.554	.10732E-2	560.804	1.66928
Vapor	.300000	133.554	.605804	2724.36	6.98900