



Opteon™ XL40

Refrigerant (R-454A)

Product Information

Pressure Temperature Tables for Opteon™ XL40 (R-454A)

Physical Property Summary

Molecular Weight	80.5 g/mol
Saturated Liquid Temperature at One Atmosphere	-47.8 °C
Saturated Vapor Temperature at One Atmosphere	-42.2 °C
Critical Temperature	81.7 °C
Critical Pressure	46.273 bar
Critical Density	456.35 kg/m ³
Critical Volume	0.00219 m ³ /kg
Ozone Depletion Potential	0
Global Warming Potential (AR4)	239
ASHRAE Standard 34 / ISO 817 Safety Rating	A2L
Lower Flammable Limit	0.278 kg/m ³

Opteon™ XL40 (R-454A) is a mildly flammable refrigerant with low global warming potential (GWP) for replacement of R-404A in new equipment designs. Opteon™ XL40 is a low GWP hydrofluoro-olefin (HFO) based refrigerant with the optimal balance of properties to replace R-404A in positive displacement, direct expansion low- and medium temperature commercial and industrial applications.

Opteon™ XL40 offers improved energy performance and higher cooling capacities which makes it easy and cost-effective to apply in new equipment without major modifications. Classified as mildly flammable (ISO/ASHRAE Class 2L), Opteon™ XL40 allows much higher charge sizes than other more highly flammable refrigerants and can be safely used by following the applicable codes and standards.

Since Opteon™ XL40 is a mildly flammable class 2L refrigerant, please check your local regulations and Standards such as PED, EN378 or ISO5149 to verify the allowable filling charge and new equipment design and safe handling requirements for the intended application.

Temperature Pressure Tables

Units: Temperature = °C, Pressure = bar gauge (Torr for <0 bar gauge)

Temperature (°C)	Saturated Pressure (bar)		Temperature (°C)	Saturated Pressure (bar)		Temperature (°C)	Saturated Pressure (bar)	
	Liquid (Bubble)	Vapor (Dew)		Liquid (Bubble)	Vapor (Dew)		Liquid (Bubble)	Vapor (Dew)
-60	355 Torr	466 Torr	-13	3.250	2.457	34	15.878	13.815
-59	332 Torr	448 Torr	-12	3.401	2.587	35	16.298	14.207
-58	308 Torr	430 Torr	-11	3.556	2.721	36	16.725	14.606
-57	283 Torr	410 Torr	-10	3.716	2.858	37	17.159	15.013
-56	257 Torr	390 Torr	-9	3.880	2.999	38	17.601	15.428
-55	230 Torr	369 Torr	-8	4.048	3.144	39	18.052	15.852
-54	202 Torr	347 Torr	-7	4.220	3.293	40	18.510	16.284
-53	172 Torr	324 Torr	-6	4.396	3.446	41	18.976	16.724
-52	141 Torr	299 Torr	-5	4.577	3.603	42	19.450	17.174
-51	109 Torr	274 Torr	-4	4.763	3.765	43	19.932	17.632
-50	76 Torr	248 Torr	-3	4.953	3.930	44	20.423	18.099
-49	42 Torr	220 Torr	-2	5.148	4.100	45	20.921	18.575
-48	6 Torr	192 Torr	-1	5.347	4.275	46	21.429	19.060
-47	0.043	162 Torr	0	5.552	4.454	47	21.945	19.554
-46	0.094	131 Torr	1	5.761	4.637	48	22.469	20.059
-45	0.148	99 Torr	2	5.975	4.826	49	23.002	20.572
-44	0.204	65 Torr	3	6.194	5.019	50	23.544	21.096
-43	0.262	30 Torr	4	6.418	5.216	51	24.095	21.630
-42	0.322	0.008	5	6.647	5.419	52	24.654	22.174
-41	0.384	0.058	6	6.882	5.626	53	25.223	22.728
-40	0.448	0.110	7	7.122	5.839	54	25.801	23.294
-39	0.515	0.165	8	7.367	6.057	55	26.388	23.869
-38	0.584	0.221	9	7.618	6.280	56	26.985	24.456
-37	0.656	0.279	10	7.874	6.508	57	27.590	25.055
-36	0.730	0.340	11	8.136	6.742	58	28.206	25.664
-35	0.806	0.402	12	8.403	6.981	59	28.831	26.286
-34	0.885	0.467	13	8.677	7.226	60	29.465	26.919
-33	0.967	0.535	14	8.956	7.476	61	30.109	27.565
-32	1.052	0.604	15	9.241	7.732	62	30.763	28.223
-31	1.139	0.676	16	9.531	7.994	63	31.427	28.894
-30	1.229	0.751	17	9.828	8.262	64	32.101	29.579
-29	1.322	0.828	18	10.132	8.536	65	32.785	30.277
-28	1.417	0.908	19	10.441	8.816	66	33.479	30.989
-27	1.516	0.990	20	10.756	9.102	67	34.184	31.716
-26	1.618	1.075	21	11.078	9.395	68	34.898	32.457
-25	1.723	1.163	22	11.407	9.694	69	35.623	33.214
-24	1.831	1.254	23	11.742	9.999	70	36.357	33.988
-23	1.943	1.347	24	12.083	10.311	71	37.102	34.778
-22	2.057	1.444	25	12.431	10.630	72	-	-
-21	2.176	1.543	26	12.786	10.955	73	-	-
-20	2.297	1.646	27	13.148	11.287	74	-	-
-19	2.422	1.752	28	13.517	11.627	75	-	-
-18	2.551	1.861	29	13.892	11.973	76	-	-
-17	2.683	1.973	30	14.275	12.327	77	-	-
-16	2.819	2.089	31	14.665	12.688	78	-	-
-15	2.959	2.208	32	15.062	13.056	79	-	-
-14	3.102	2.331	33	15.466	13.432	80	-	-

Pressure Temperature Tables

Units: Pressure = bar gauge (Torr for <0 bar gauge), Temperature = °C

Pressure (bar)	Saturated Temperature (°C)		Pressure (bar)	Saturated Temperature (°C)		Pressure (bar)	Saturated Temperature (°C)	
	Liquid (Bubble)	Vapor (Dew)		Liquid (Bubble)	Vapor (Dew)		Liquid (Bubble)	Vapor (Dew)
385 Torr	-61.4	-55.8	1.08	-31.7	-25.9	7.776	9.6	15.2
374 Torr	-60.9	-55.3	1.14	-31.0	-25.3	8.027	10.6	16.1
363 Torr	-60.4	-54.7	1.201	-30.3	-24.6	8.285	11.6	17.1
352 Torr	-59.9	-54.2	1.264	-29.6	-23.9	8.55	12.5	18.0
340 Torr	-59.3	-53.7	1.329	-28.9	-23.2	8.823	13.5	19.0
328 Torr	-58.8	-53.2	1.396	-28.2	-22.5	9.104	14.5	20.0
316 Torr	-58.3	-52.7	1.465	-27.5	-21.8	9.393	15.5	21.0
303 Torr	-57.8	-52.1	1.536	-26.8	-21.1	9.69	16.5	22.0
290 Torr	-57.3	-51.6	1.609	-26.1	-20.4	9.995	17.6	23.0
277 Torr	-56.8	-51.1	1.684	-25.4	-19.6	10.309	18.6	24.0
263 Torr	-56.2	-50.6	1.761	-24.6	-18.9	10.632	19.6	25.0
249 Torr	-55.7	-50.0	1.84	-23.9	-18.2	10.964	20.6	26.0
235 Torr	-55.2	-49.5	1.921	-23.2	-17.5	11.306	21.7	27.1
220 Torr	-54.6	-49.0	2.005	-22.5	-16.7	11.657	22.7	28.1
204 Torr	-54.1	-48.4	2.091	-21.7	-16.0	12.018	23.8	29.1
188 Torr	-53.5	-47.9	2.18	-21.0	-15.2	12.39	24.9	30.2
172 Torr	-53.0	-47.3	2.271	-20.2	-14.5	12.772	26.0	31.2
155 Torr	-52.4	-46.8	2.365	-19.5	-13.7	13.165	27.0	32.3
138 Torr	-51.9	-46.2	2.461	-18.7	-13.0	13.569	28.1	33.4
120 Torr	-51.3	-45.7	2.56	-17.9	-12.2	13.985	29.2	34.4
102 Torr	-50.8	-45.1	2.662	-17.2	-11.4	14.413	30.4	35.5
83 Torr	-50.2	-44.5	2.767	-16.4	-10.7	14.853	31.5	36.6
64 Torr	-49.6	-44.0	2.875	-15.6	-9.9	15.306	32.6	37.7
44 Torr	-49.1	-43.4	2.986	-14.8	-9.1	15.771	33.7	38.8
24 Torr	-48.5	-42.8	3.1	-14.0	-8.3	16.25	34.9	39.9
3 Torr	-47.9	-42.2	3.217	-13.2	-7.5	16.742	36.0	41.0
0.025	-47.3	-41.7	3.338	-12.4	-6.7	17.248	37.2	42.2
0.055	-46.8	-41.1	3.462	-11.6	-5.9	17.769	38.4	43.3
0.085	-46.2	-40.5	3.59	-10.8	-5.1	18.305	39.6	44.4
0.116	-45.6	-39.9	3.721	-10.0	-4.3	18.856	40.7	45.6
0.148	-45.0	-39.3	3.856	-9.1	-3.4	19.423	41.9	46.7
0.181	-44.4	-38.7	3.995	-8.3	-2.6	20.006	43.2	47.9
0.215	-43.8	-38.1	4.138	-7.5	-1.8	20.605	44.4	49.1
0.25	-43.2	-37.5	4.285	-6.6	-0.9	21.222	45.6	50.2
0.286	-42.6	-36.9	4.436	-5.8	-0.1	21.856	46.8	51.4
0.323	-42.0	-36.3	4.591	-4.9	0.7	22.508	48.1	52.6
0.361	-41.4	-35.7	4.751	-4.1	1.6	23.179	49.3	53.8
0.4	-40.7	-35.0	4.915	-3.2	2.5	23.869	50.6	55.0
0.44	-40.1	-34.4	5.084	-2.3	3.3	24.579	51.9	56.2
0.481	-39.5	-33.8	5.258	-1.4	4.2	25.309	53.1	57.4
0.524	-38.9	-33.2	5.437	-0.6	5.1	26.06	54.4	58.6
0.568	-38.2	-32.5	5.621	0.3	6.0	26.832	55.7	59.9
0.613	-37.6	-31.9	5.81	1.2	6.9	27.626	57.1	61.1
0.659	-37.0	-31.2	6.005	2.1	7.8	28.443	58.4	62.3
0.707	-36.3	-30.6	6.205	3.0	8.7	29.283	59.7	63.6
0.756	-35.7	-29.9	6.411	4.0	9.6	30.147	61.1	64.8
0.806	-35.0	-29.3	6.623	4.9	10.5	31.036	62.4	66.1
0.858	-34.3	-28.6	6.841	5.8	11.4	31.95	63.8	67.3
0.911	-33.7	-28.0	7.065	6.8	12.3	32.89	65.2	68.6
0.966	-33.0	-27.3	7.295	7.7	13.3	33.857	66.5	69.8
1.022	-32.3	-26.6	7.532	8.7	14.2	34.852	67.9	71.1
						35.875	69.3	72.4

Temperature Pressure Tables

Units: Temperature = °C, Pressure = bar absolute

Temperature (°C)	Saturated Pressure (bar)	
	Liquid (Bubble)	Vapor (Dew)
-60	0.540	0.392
-59	0.570	0.416
-58	0.602	0.440
-57	0.636	0.466
-56	0.670	0.493
-55	0.706	0.521
-54	0.744	0.551
-53	0.784	0.582
-52	0.824	0.614
-51	0.867	0.647
-50	0.912	0.682
-49	0.958	0.719
-48	1.006	0.757
-47	1.056	0.797
-46	1.107	0.838
-45	1.161	0.881
-44	1.217	0.926
-43	1.275	0.973
-42	1.335	1.021
-41	1.397	1.071
-40	1.461	1.123
-39	1.528	1.178
-38	1.597	1.234
-37	1.669	1.292
-36	1.743	1.353
-35	1.819	1.415
-34	1.898	1.480
-33	1.980	1.548
-32	2.065	1.617
-31	2.152	1.689
-30	2.242	1.764
-29	2.335	1.841
-28	2.430	1.921
-27	2.529	2.003
-26	2.631	2.088
-25	2.736	2.176
-24	2.844	2.267
-23	2.956	2.360
-22	3.070	2.457
-21	3.189	2.556
-20	3.310	2.659
-19	3.435	2.765
-18	3.564	2.874
-17	3.696	2.986
-16	3.832	3.102
-15	3.972	3.221
-14	4.115	3.344

Temperature (°C)	Saturated Pressure (bar)	
	Liquid (Bubble)	Vapor (Dew)
-13	4.263	3.470
-12	4.414	3.600
-11	4.569	3.734
-10	4.729	3.871
-9	4.893	4.012
-8	5.061	4.157
-7	5.233	4.306
-6	5.409	4.459
-5	5.590	4.616
-4	5.776	4.778
-3	5.966	4.943
-2	6.161	5.113
-1	6.360	5.288
0	6.565	5.467
1	6.774	5.650
2	6.988	5.839
3	7.207	6.032
4	7.431	6.229
5	7.660	6.432
6	7.895	6.639
7	8.135	6.852
8	8.380	7.070
9	8.631	7.293
10	8.887	7.521
11	9.149	7.755
12	9.416	7.994
13	9.690	8.239
14	9.969	8.489
15	10.254	8.745
16	10.544	9.007
17	10.841	9.275
18	11.145	9.549
19	11.454	9.829
20	11.769	10.115
21	12.091	10.408
22	12.420	10.707
23	12.755	11.012
24	13.096	11.324
25	13.444	11.643
26	13.799	11.968
27	14.161	12.300
28	14.530	12.640
29	14.905	12.986
30	15.288	13.340
31	15.678	13.701
32	16.075	14.069
33	16.479	14.445

Temperature (°C)	Saturated Pressure (bar)	
	Liquid (Bubble)	Vapor (Dew)
34	16.891	14.828
35	17.311	15.220
36	17.738	15.619
37	18.172	16.026
38	18.614	16.441
39	19.065	16.865
40	19.523	17.297
41	19.989	17.737
42	20.463	18.187
43	20.945	18.645
44	21.436	19.112
45	21.934	19.588
46	22.442	20.073
47	22.958	20.567
48	23.482	21.072
49	24.015	21.585
50	24.557	22.109
51	25.108	22.643
52	25.667	23.187
53	26.236	23.741
54	26.814	24.307
55	27.401	24.882
56	27.998	25.469
57	28.603	26.068
58	29.219	26.677
59	29.844	27.299
60	30.478	27.932
61	31.122	28.578
62	31.776	29.236
63	32.440	29.907
64	33.114	30.592
65	33.798	31.290
66	34.492	32.002
67	35.197	32.729
68	35.911	33.470
69	36.636	34.227
70	37.370	35.001
71	38.115	35.791
72	-	-
73	-	-
74	-	-
75	-	-
76	-	-
77	-	-
78	-	-
79	-	-
80	-	-

Pressure Temperature Tables

Units: Pressure = bar absolute, Temperature = °C

Pressure (bar)	Saturated Temperature (°C)	
	Liquid (Bubble)	Vapor (Dew)
0.5	-61.4	-55.8
0.514	-60.9	-55.3
0.529	-60.4	-54.7
0.544	-59.9	-54.2
0.56	-59.3	-53.7
0.576	-58.8	-53.2
0.592	-58.3	-52.7
0.609	-57.8	-52.1
0.626	-57.3	-51.6
0.644	-56.8	-51.1
0.662	-56.2	-50.6
0.681	-55.7	-50.0
0.7	-55.2	-49.5
0.72	-54.6	-49.0
0.741	-54.1	-48.4
0.762	-53.5	-47.9
0.784	-53.0	-47.3
0.806	-52.4	-46.8
0.829	-51.9	-46.2
0.853	-51.3	-45.7
0.877	-50.8	-45.1
0.902	-50.2	-44.5
0.928	-49.6	-44.0
0.954	-49.1	-43.4
0.981	-48.5	-42.8
1.009	-47.9	-42.2
1.038	-47.3	-41.7
1.068	-46.8	-41.1
1.098	-46.2	-40.5
1.129	-45.6	-39.9
1.161	-45.0	-39.3
1.194	-44.4	-38.7
1.228	-43.8	-38.1
1.263	-43.2	-37.5
1.299	-42.6	-36.9
1.336	-42.0	-36.3
1.374	-41.4	-35.7
1.413	-40.7	-35.0
1.453	-40.1	-34.4
1.494	-39.5	-33.8
1.537	-38.9	-33.2
1.581	-38.2	-32.5
1.626	-37.6	-31.9
1.672	-37.0	-31.2
1.72	-36.3	-30.6
1.769	-35.7	-29.9
1.819	-35.0	-29.3
1.871	-34.3	-28.6
1.924	-33.7	-28.0
1.979	-33.0	-27.3
2.035	-32.3	-26.6

Pressure (bar)	Saturated Temperature (°C)	
	Liquid (Bubble)	Vapor (Dew)
2.093	-31.7	-25.9
2.153	-31.0	-25.3
2.214	-30.3	-24.6
2.277	-29.6	-23.9
2.342	-28.9	-23.2
2.409	-28.2	-22.5
2.478	-27.5	-21.8
2.549	-26.8	-21.1
2.622	-26.1	-20.4
2.697	-25.4	-19.6
2.774	-24.6	-18.9
2.853	-23.9	-18.2
2.934	-23.2	-17.5
3.018	-22.5	-16.7
3.104	-21.7	-16.0
3.193	-21.0	-15.2
3.284	-20.2	-14.5
3.378	-19.5	-13.7
3.474	-18.7	-13.0
3.573	-17.9	-12.2
3.675	-17.2	-11.4
3.78	-16.4	-10.7
3.888	-15.6	-9.9
3.999	-14.8	-9.1
4.113	-14.0	-8.3
4.23	-13.2	-7.5
4.351	-12.4	-6.7
4.475	-11.6	-5.9
4.603	-10.8	-5.1
4.734	-10.0	-4.3
4.869	-9.1	-3.4
5.008	-8.3	-2.6
5.151	-7.5	-1.8
5.298	-6.6	-0.9
5.449	-5.8	-0.1
5.604	-4.9	0.7
5.764	-4.1	1.6
5.928	-3.2	2.5
6.097	-2.3	3.3
6.271	-1.4	4.2
6.45	-0.6	5.1
6.634	0.3	6.0
6.823	1.2	6.9
7.018	2.1	7.8
7.218	3.0	8.7
7.424	4.0	9.6
7.636	4.9	10.5
7.854	5.8	11.4
8.078	6.8	12.3
8.308	7.7	13.3
8.545	8.7	14.2

Pressure (bar)	Saturated Temperature (°C)	
	Liquid (Bubble)	Vapor (Dew)
8.789	9.6	15.2
9.04	10.6	16.1
9.298	11.6	17.1
9.563	12.5	18.0
9.836	13.5	19.0
10.117	14.5	20.0
10.406	15.5	21.0
10.703	16.5	22.0
11.008	17.6	23.0
11.322	18.6	24.0
11.645	19.6	25.0
11.977	20.6	26.0
12.319	21.7	27.1
12.67	22.7	28.1
13.031	23.8	29.1
13.403	24.9	30.2
13.785	26.0	31.2
14.178	27.0	32.3
14.582	28.1	33.4
14.998	29.2	34.4
15.426	30.4	35.5
15.866	31.5	36.6
16.319	32.6	37.7
16.784	33.7	38.8
17.263	34.9	39.9
17.755	36.0	41.0
18.261	37.2	42.2
18.782	38.4	43.3
19.318	39.6	44.4
19.869	40.7	45.6
20.436	41.9	46.7
21.019	43.2	47.9
21.618	44.4	49.1
22.235	45.6	50.2
22.869	46.8	51.4
23.521	48.1	52.6
24.192	49.3	53.8
24.882	50.6	55.0
25.592	51.9	56.2
26.322	53.1	57.4
27.073	54.4	58.6
27.845	55.7	59.9
28.639	57.1	61.1
29.456	58.4	62.3
30.296	59.7	63.6
31.16	61.1	64.8
32.049	62.4	66.1
32.963	63.8	67.3
33.903	65.2	68.6
34.87	66.5	69.8
35.865	67.9	71.1
36.888	69.3	72.4

Opteon™ XL40 (R-454A)

Temperature Pressure Tables

Units: Temperature = °C, Pressure = kPa

Temperature (°C)	Saturated Pressure (kPa)	
	Liquid (Bubble)	Vapor (Dew)
-60	54	39
-59	57	42
-58	60	44
-57	64	47
-56	67	49
-55	71	52
-54	74	55
-53	78	58
-52	82	61
-51	87	65
-50	91	68
-49	96	72
-48	101	76
-47	106	80
-46	111	84
-45	116	88
-44	122	93
-43	127	97
-42	133	102
-41	140	107
-40	146	112
-39	153	118
-38	160	123
-37	167	129
-36	174	135
-35	182	142
-34	190	148
-33	198	155
-32	206	162
-31	215	169
-30	224	176
-29	233	184
-28	243	192
-27	253	200
-26	263	209
-25	274	218
-24	284	227
-23	296	236
-22	307	246
-21	319	256
-20	331	266
-19	344	277
-18	356	287
-17	370	299
-16	383	310
-15	397	322
-14	412	334

Temperature (°C)	Saturated Pressure (kPa)	
	Liquid (Bubble)	Vapor (Dew)
-13	426	347
-12	441	360
-11	457	373
-10	473	387
-9	489	401
-8	506	416
-7	523	431
-6	541	446
-5	559	462
-4	578	478
-3	597	494
-2	616	511
-1	636	529
0	656	547
1	677	565
2	699	584
3	721	603
4	743	623
5	766	643
6	790	664
7	813	685
8	838	707
9	863	729
10	889	752
11	915	775
12	942	799
13	969	824
14	997	849
15	1025	875
16	1054	901
17	1084	928
18	1114	955
19	1145	983
20	1177	1012
21	1209	1041
22	1242	1071
23	1275	1101
24	1310	1132
25	1344	1164
26	1380	1197
27	1416	1230
28	1453	1264
29	1491	1299
30	1529	1334
31	1568	1370
32	1607	1407
33	1648	1444

Temperature (°C)	Saturated Pressure (kPa)	
	Liquid (Bubble)	Vapor (Dew)
34	1689	1483
35	1731	1522
36	1774	1562
37	1817	1603
38	1861	1644
39	1906	1686
40	1952	1730
41	1999	1774
42	2046	1819
43	2095	1864
44	2144	1911
45	2193	1959
46	2244	2007
47	2296	2057
48	2348	2107
49	2402	2159
50	2456	2211
51	2511	2264
52	2567	2319
53	2624	2374
54	2681	2431
55	2740	2488
56	2800	2547
57	2860	2607
58	2922	2668
59	2984	2730
60	3048	2793
61	3112	2858
62	3178	2924
63	3244	2991
64	3311	3059
65	3380	3129
66	3449	3200
67	3520	3273
68	3591	3347
69	3664	3423
70	3737	3500
71	3812	3579
72	-	-
73	-	-
74	-	-
75	-	-
76	-	-
77	-	-
78	-	-
79	-	-
80	-	-

Pressure Temperature Tables

Units: Pressure = bar kPa, Temperature = °C

Pressure (kPa)	Saturated Temperature (°C)	
	Liquid (Bubble)	Vapor (Dew)
50	-61.4	-55.8
51	-61.0	-55.4
52	-60.7	-55.0
53	-60.3	-54.7
54	-60.0	-54.4
55	-59.7	-54.0
56	-59.3	-53.7
57	-59.0	-53.4
58	-58.7	-53.1
59	-58.4	-52.7
60	-58.1	-52.4
61	-57.8	-52.1
62	-57.5	-51.8
63	-57.2	-51.5
64	-56.9	-51.2
66	-56.3	-50.6
68	-55.7	-50.1
70	-55.2	-49.5
72	-54.6	-49.0
74	-54.1	-48.4
76	-53.6	-47.9
78	-53.1	-47.4
80	-52.6	-46.9
82	-52.1	-46.4
84	-51.6	-46.0
86	-51.2	-45.5
88	-50.7	-45.0
90	-50.3	-44.6
92	-49.8	-44.1
94	-49.4	-43.7
96	-49.0	-43.3
99	-48.3	-42.6
102	-47.7	-42.0
105	-47.1	-41.4
108	-46.5	-40.8
111	-45.9	-40.3
114	-45.4	-39.7
117	-44.8	-39.1
120	-44.3	-38.6
123	-43.8	-38.1
126	-43.3	-37.5
129	-42.7	-37.0
133	-42.1	-36.4
137	-41.4	-35.7
141	-40.8	-35.1
145	-40.2	-34.5
149	-39.6	-33.9
153	-39.0	-33.3
157	-38.4	-32.7
161	-37.8	-32.1
166	-37.1	-31.4

Pressure (kPa)	Saturated Temperature (°C)	
	Liquid (Bubble)	Vapor (Dew)
171	-36.4	-30.7
176	-35.8	-30.1
181	-35.1	-29.4
186	-34.5	-28.8
191	-33.9	-28.1
197	-33.1	-27.4
203	-32.4	-26.7
209	-31.7	-26.0
215	-31.0	-25.3
221	-30.3	-24.6
227	-29.7	-24.0
234	-28.9	-23.2
241	-28.2	-22.5
248	-27.5	-21.8
255	-26.8	-21.1
263	-26.0	-20.3
271	-25.2	-19.5
279	-24.5	-18.8
287	-23.8	-18.0
296	-23.0	-17.2
305	-22.2	-16.4
314	-21.4	-15.7
323	-20.7	-14.9
333	-19.8	-14.1
343	-19.0	-13.3
353	-18.3	-12.5
364	-17.4	-11.7
375	-16.6	-10.9
386	-15.8	-10.1
398	-14.9	-9.2
410	-14.1	-8.4
422	-13.3	-7.6
435	-12.4	-6.7
448	-11.6	-5.9
462	-10.7	-5.0
476	-9.8	-4.1
491	-8.9	-3.2
506	-8.0	-2.3
521	-7.1	-1.4
537	-6.2	-0.5
553	-5.3	0.3
570	-4.4	1.3
587	-3.5	2.2
605	-2.6	3.1
624	-1.6	4.1
643	-0.7	5.0
663	0.3	6.0
683	1.3	6.9
704	2.2	7.9
726	3.2	8.9
748	4.2	9.8

Pressure (kPa)	Saturated Temperature (°C)	
	Liquid (Bubble)	Vapor (Dew)
771	5.2	10.8
795	6.2	11.8
820	7.3	12.8
845	8.3	13.8
871	9.3	14.9
898	10.4	15.9
926	11.4	16.9
955	12.5	18.0
985	13.6	19.1
1016	14.7	20.2
1048	15.8	21.2
1081	16.9	22.3
1115	18.0	23.4
1150	19.1	24.6
1186	20.3	25.7
1223	21.4	26.8
1261	22.6	27.9
1300	23.7	29.0
1340	24.9	30.2
1382	26.1	31.3
1425	27.2	32.5
1469	28.4	33.6
1515	29.6	34.8
1562	30.9	36.0
1611	32.1	37.2
1661	33.3	38.4
1713	34.6	39.6
1767	35.8	40.8
1822	37.1	42.1
1879	38.4	43.3
1938	39.7	44.6
1999	41.0	45.8
2062	42.3	47.1
2127	43.7	48.4
2194	45.0	49.7
2263	46.4	51.0
2334	47.7	52.3
2407	49.1	53.6
2482	50.5	54.9
2560	51.9	56.2
2640	53.3	57.5
2723	54.7	58.9
2808	56.1	60.2
2896	57.6	61.6
2987	59.0	62.9
3081	60.5	64.3
3178	62.0	65.7
3278	63.5	67.1
3381	65.0	68.5
3487	66.5	69.8
3596	68.1	71.2
3709	69.6	72.6



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