



Opteon™ XL41

Refrigerant

Thermodynamic Properties of Opteon™ XL41 (R-454B) Engineering (I/P) Units

Physical Properties

Molecular Weight	62.6 lbm/lb-mole
Boiling Point at	
One Atmosphere	-58.9 °F
Critical Temperature	172.6 °F
Critical Pressure	763.9 psia
Critical Density	27.64 lb/ft ³
Critical Volume	0.0362 ft ³ /lb
Ozone Depletion Potential	0
Global Warming Potential (AR4)	466
ASHRAE Standard 34 Safety Classification	A2L

Units and Factors

t = temperature in °F
P = pressure in lb/in² absolute (psia)
v_f = volume of saturated liquid in ft³/lb
v_g = volume of saturated vapor in ft³/lb
V = volume of superheated vapor in ft³/lb
d_f = 1/v_f = density of saturated liquid in lb/ft³
d_g = 1/v_g = density of saturated vapor in lb/ft³
h_f = enthalpy of saturated liquid in Btu/lb
h_{fg} = enthalpy of vaporization in Btu/lb
h_g = enthalpy of saturated vapor in Btu/lb
H = enthalpy of superheated vapor in Btu/lb
s_f = entropy of saturated liquid in Btu/(lb) (°R)
s_g = entropy of saturated vapor in Btu/(lb) (°R)
S = entropy of superheated vapor in Btu/(lb) (°R)

One atmosphere = 14.696 psia

Reference point for enthalpy and entropy:

h_f = 0.0 Btu/lb at -40°F

s_f = 0.0 Btu/lb·°R at -40°F

This information is based on NIST Standard Database 23, Version 10.0 (Lemmon, E.W.; Huber, M.L.; McLinden, M.O.; REFPROP Reference Fluid Thermodynamic and Transport Properties - National Institute of Standards and Technology, 2018).

Opteon™ XL41 (R-454B)
Saturation Properties - Temperature Table

Temp °F	Pressure [psia]		Volume [ft ³ /lb]		Density [lb/ft ³]		Enthalpy [BTU/lb]			Entropy [BTU/lb·°R]		Temp °F
	Liquid P _l	Vapor P _g	Liquid v _l	Vapor v _g	Liquid d _l	Vapor d _g	Liquid h _l	Latent h _{lg}	Vapor h _g	Liquid s _l	Vapor s _g	
-60	14.25	13.55	0.01291	4.84941	77.434	0.2062	-7.08	136.08	129.00	-0.0172	0.3242	-60
-59	14.65	13.93	0.01293	4.72305	77.337	0.2117	-6.73	135.86	129.13	-0.0163	0.3237	-59
-58	15.06	14.33	0.01295	4.60066	77.240	0.2174	-6.37	135.64	129.26	-0.0155	0.3232	-58
-57	15.49	14.73	0.01296	4.48208	77.142	0.2231	-6.02	135.41	129.39	-0.0146	0.3226	-57
-56	15.92	15.14	0.01298	4.36718	77.045	0.2290	-5.67	135.19	129.52	-0.0137	0.3221	-56
-55	16.36	15.57	0.01300	4.25582	76.947	0.2350	-5.32	134.97	129.65	-0.0129	0.3216	-55
-54	16.81	16.00	0.01301	4.14788	76.849	0.2411	-4.96	134.74	129.78	-0.0120	0.3211	-54
-53	17.27	16.44	0.01303	4.04324	76.751	0.2473	-4.61	134.52	129.91	-0.0111	0.3206	-53
-52	17.74	16.89	0.01305	3.94178	76.653	0.2537	-4.26	134.29	130.04	-0.0103	0.3201	-52
-51	18.22	17.35	0.01306	3.84338	76.555	0.2602	-3.90	134.07	130.16	-0.0094	0.3196	-51
-50	18.72	17.82	0.01308	3.74794	76.456	0.2668	-3.55	133.84	130.29	-0.0085	0.3191	-50
-49	19.22	18.30	0.01310	3.65535	76.357	0.2736	-3.20	133.62	130.42	-0.0077	0.3186	-49
-48	19.73	18.79	0.01311	3.56552	76.258	0.2805	-2.84	133.39	130.55	-0.0068	0.3181	-48
-47	20.25	19.29	0.01313	3.47835	76.159	0.2875	-2.49	133.16	130.67	-0.0060	0.3176	-47
-46	20.79	19.80	0.01315	3.39374	76.060	0.2947	-2.13	132.93	130.80	-0.0051	0.3172	-46
-45	21.33	20.32	0.01316	3.31162	75.960	0.3020	-1.78	132.70	130.92	-0.0042	0.3167	-45
-44	21.89	20.85	0.01318	3.23189	75.860	0.3094	-1.42	132.47	131.05	-0.0034	0.3162	-44
-43	22.45	21.39	0.01320	3.15447	75.760	0.3170	-1.07	132.24	131.17	-0.0025	0.3157	-43
-42	23.03	21.95	0.01322	3.07928	75.660	0.3248	-0.71	132.01	131.30	-0.0017	0.3153	-42
-41	23.62	22.51	0.01323	3.00626	75.559	0.3326	-0.36	131.78	131.42	-0.0008	0.3148	-41
-40	24.23	23.09	0.01325	2.93532	75.459	0.3407	0.00	131.54	131.54	0.0000	0.3143	-40
-39	24.84	23.68	0.01327	2.86640	75.358	0.3489	0.36	131.31	131.66	0.0008	0.3139	-39
-38	25.47	24.27	0.01329	2.79943	75.257	0.3572	0.71	131.07	131.79	0.0017	0.3134	-38
-37	26.10	24.89	0.01331	2.73435	75.156	0.3657	1.07	130.84	131.91	0.0025	0.3130	-37
-36	26.76	25.51	0.01332	2.67109	75.054	0.3744	1.43	130.60	132.03	0.0034	0.3125	-36
-35	27.42	26.14	0.01334	2.60959	74.952	0.3832	1.79	130.37	132.15	0.0042	0.3121	-35
-34	28.10	26.79	0.01336	2.54980	74.850	0.3922	2.14	130.13	132.27	0.0050	0.3116	-34
-33	28.79	27.45	0.01338	2.49166	74.748	0.4013	2.50	129.89	132.39	0.0059	0.3112	-33
-32	29.49	28.13	0.01340	2.43512	74.646	0.4107	2.86	129.65	132.51	0.0067	0.3107	-32
-31	30.20	28.81	0.01342	2.38012	74.543	0.4201	3.22	129.41	132.63	0.0076	0.3103	-31
-30	30.93	29.51	0.01343	2.32662	74.440	0.4298	3.58	129.17	132.75	0.0084	0.3099	-30
-29	31.68	30.22	0.01345	2.27456	74.337	0.4396	3.94	128.93	132.87	0.0092	0.3094	-29
-28	32.43	30.95	0.01347	2.22391	74.234	0.4497	4.30	128.68	132.98	0.0101	0.3090	-28
-27	33.20	31.69	0.01349	2.17462	74.130	0.4599	4.66	128.44	133.10	0.0109	0.3086	-27
-26	33.99	32.44	0.01351	2.12665	74.026	0.4702	5.02	128.20	133.22	0.0117	0.3082	-26
-25	34.79	33.21	0.01353	2.07994	73.922	0.4808	5.38	127.95	133.33	0.0125	0.3077	-25
-24	35.60	33.99	0.01355	2.03448	73.818	0.4915	5.74	127.71	133.45	0.0134	0.3073	-24
-23	36.43	34.78	0.01357	1.99020	73.714	0.5025	6.10	127.46	133.56	0.0142	0.3069	-23
-22	37.27	35.59	0.01359	1.94709	73.609	0.5136	6.47	127.21	133.68	0.0150	0.3065	-22
-21	38.13	36.41	0.01360	1.90510	73.504	0.5249	6.83	126.96	133.79	0.0158	0.3061	-21
-20	39.01	37.25	0.01362	1.86421	73.398	0.5364	7.19	126.71	133.90	0.0167	0.3057	-20
-19	39.90	38.10	0.01364	1.82436	73.293	0.5481	7.55	126.46	134.02	0.0175	0.3053	-19
-18	40.80	38.97	0.01366	1.78554	73.187	0.5601	7.92	126.21	134.13	0.0183	0.3049	-18
-17	41.72	39.85	0.01368	1.74772	73.081	0.5722	8.28	125.96	134.24	0.0191	0.3045	-17
-16	42.66	40.75	0.01370	1.71085	72.975	0.5845	8.65	125.71	134.35	0.0199	0.3041	-16
-15	43.61	41.67	0.01372	1.67492	72.868	0.5970	9.01	125.45	134.46	0.0207	0.3037	-15
-14	44.58	42.60	0.01374	1.63990	72.762	0.6098	9.38	125.20	134.57	0.0216	0.3033	-14
-13	45.57	43.54	0.01376	1.60576	72.654	0.6228	9.74	124.94	134.68	0.0224	0.3029	-13
-12	46.57	44.50	0.01378	1.57246	72.547	0.6359	10.11	124.69	134.79	0.0232	0.3025	-12
-11	47.59	45.48	0.01380	1.54000	72.440	0.6493	10.47	124.43	134.90	0.0240	0.3021	-11
-10	48.62	46.48	0.01383	1.50834	72.332	0.6630	10.84	124.17	135.01	0.0248	0.3017	-10
-9	49.68	47.49	0.01385	1.47747	72.223	0.6768	11.21	123.91	135.11	0.0256	0.3013	-9
-8	50.75	48.52	0.01387	1.44735	72.115	0.6909	11.57	123.65	135.22	0.0264	0.3010	-8
-7	51.84	49.56	0.01389	1.41796	72.006	0.7052	11.94	123.39	135.33	0.0272	0.3006	-7
-6	52.94	50.63	0.01391	1.38929	71.897	0.7198	12.31	123.12	135.43	0.0280	0.3002	-6
-5	54.07	51.71	0.01393	1.36131	71.788	0.7346	12.68	122.86	135.54	0.0288	0.2998	-5
-4	55.21	52.81	0.01395	1.33401	71.678	0.7496	13.05	122.59	135.64	0.0296	0.2995	-4

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Saturation Properties - Temperature Table

Temp °F	Pressure [psia]		Volume [ft ³ /lb]		Density [lb/ft ³]		Enthalpy [BTU/lb]			Entropy [BTU/lb·°R]		Temp °F
	Liquid P _l	Vapor P _g	Liquid v _l	Vapor v _g	Liquid d _l	Vapor d _g	Liquid h _l	Latent h _{lg}	Vapor h _g	Liquid s _l	Vapor s _g	
-3	56.37	53.92	0.01397	1.30737	71.569	0.7649	13.42	122.33	135.74	0.0304	0.2991	-3
-2	57.55	55.06	0.01399	1.28136	71.458	0.7804	13.79	122.06	135.85	0.0312	0.2987	-2
-1	58.75	56.21	0.01402	1.25596	71.348	0.7962	14.16	121.79	135.95	0.0321	0.2983	-1
0	59.97	57.38	0.01404	1.23117	71.237	0.8122	14.53	121.52	136.05	0.0329	0.2980	0
1	61.21	58.57	0.01406	1.20697	71.126	0.8285	14.90	121.25	136.15	0.0337	0.2976	1
2	62.46	59.78	0.01408	1.18333	71.015	0.8451	15.27	120.98	136.25	0.0344	0.2973	2
3	63.74	61.00	0.01410	1.16024	70.903	0.8619	15.64	120.71	136.35	0.0352	0.2969	3
4	65.04	62.25	0.01413	1.13769	70.791	0.8790	16.02	120.43	136.45	0.0360	0.2965	4
5	66.35	63.52	0.01415	1.11566	70.679	0.8963	16.39	120.16	136.55	0.0368	0.2962	5
6	67.69	64.80	0.01417	1.09414	70.566	0.9140	16.76	119.88	136.65	0.0376	0.2958	6
7	69.04	66.11	0.01419	1.07312	70.453	0.9319	17.14	119.61	136.74	0.0384	0.2955	7
8	70.42	67.43	0.01422	1.05257	70.340	0.9501	17.51	119.33	136.84	0.0392	0.2951	8
9	71.82	68.78	0.01424	1.03249	70.226	0.9685	17.89	119.05	136.93	0.0400	0.2948	9
10	73.24	70.14	0.01426	1.01287	70.112	0.9873	18.26	118.77	137.03	0.0408	0.2944	10
11	74.68	71.53	0.01429	0.99369	69.998	1.0064	18.64	118.48	137.12	0.0416	0.2941	11
12	76.14	72.94	0.01431	0.97494	69.883	1.0257	19.02	118.20	137.22	0.0424	0.2937	12
13	77.63	74.37	0.01433	0.95661	69.768	1.0454	19.39	117.92	137.31	0.0432	0.2934	13
14	79.13	75.82	0.01436	0.93869	69.653	1.0653	19.77	117.63	137.40	0.0440	0.2930	14
15	80.66	77.29	0.01438	0.92116	69.537	1.0856	20.15	117.34	137.49	0.0448	0.2927	15
16	82.21	78.78	0.01440	0.90402	69.421	1.1062	20.53	117.05	137.58	0.0456	0.2923	16
17	83.78	80.29	0.01443	0.88726	69.305	1.1271	20.91	116.76	137.67	0.0463	0.2920	17
18	85.38	81.83	0.01445	0.87086	69.188	1.1483	21.29	116.47	137.76	0.0471	0.2917	18
19	87.00	83.39	0.01448	0.85483	69.071	1.1698	21.67	116.18	137.85	0.0479	0.2913	19
20	88.64	84.97	0.01450	0.83914	68.954	1.1917	22.05	115.89	137.93	0.0487	0.2910	20
21	90.30	86.58	0.01453	0.82379	68.836	1.2139	22.43	115.59	138.02	0.0495	0.2907	21
22	91.99	88.21	0.01455	0.80877	68.718	1.2365	22.81	115.30	138.11	0.0503	0.2903	22
23	93.70	89.86	0.01458	0.79407	68.599	1.2593	23.19	115.00	138.19	0.0511	0.2900	23
24	95.44	91.53	0.01460	0.77968	68.480	1.2826	23.58	114.70	138.27	0.0518	0.2897	24
25	97.20	93.23	0.01463	0.76560	68.361	1.3062	23.96	114.40	138.36	0.0526	0.2893	25
26	98.98	94.95	0.01465	0.75182	68.241	1.3301	24.34	114.09	138.44	0.0534	0.2890	26
27	100.79	96.70	0.01468	0.73833	68.121	1.3544	24.73	113.79	138.52	0.0542	0.2887	27
28	102.63	98.47	0.01471	0.72512	68.000	1.3791	25.11	113.49	138.60	0.0550	0.2883	28
29	104.49	100.26	0.01473	0.71219	67.879	1.4041	25.50	113.18	138.68	0.0557	0.2880	29
30	106.37	102.08	0.01476	0.69953	67.758	1.4295	25.89	112.87	138.76	0.0565	0.2877	30
31	108.28	103.92	0.01479	0.68713	67.636	1.4553	26.28	112.56	138.84	0.0573	0.2874	31
32	110.22	105.79	0.01481	0.67498	67.514	1.4815	26.66	112.25	138.91	0.0581	0.2870	32
33	112.18	107.69	0.01484	0.66309	67.391	1.5081	27.05	111.94	138.99	0.0589	0.2867	33
34	114.17	109.61	0.01487	0.65144	67.268	1.5351	27.44	111.62	139.06	0.0596	0.2864	34
35	116.18	111.55	0.01489	0.64002	67.144	1.5624	27.83	111.31	139.14	0.0604	0.2861	35
36	118.23	113.53	0.01492	0.62884	67.020	1.5902	28.22	110.99	139.21	0.0612	0.2858	36
37	120.30	115.53	0.01495	0.61789	66.896	1.6184	28.61	110.67	139.28	0.0620	0.2854	37
38	122.39	117.55	0.01498	0.60715	66.771	1.6470	29.00	110.35	139.35	0.0627	0.2851	38
39	124.51	119.60	0.01500	0.59663	66.646	1.6761	29.40	110.02	139.42	0.0635	0.2848	39
40	126.66	121.68	0.01503	0.58632	66.520	1.7056	29.79	109.70	139.49	0.0643	0.2845	40
41	128.84	123.79	0.01506	0.57621	66.393	1.7355	30.18	109.37	139.56	0.0651	0.2842	41
42	131.05	125.92	0.01509	0.56631	66.267	1.7658	30.58	109.05	139.63	0.0659	0.2838	42
43	133.28	128.08	0.01512	0.55660	66.139	1.7966	30.97	108.72	139.69	0.0666	0.2835	43
44	135.55	130.27	0.01515	0.54708	66.012	1.8279	31.37	108.39	139.76	0.0674	0.2832	44
45	137.84	132.49	0.01518	0.53775	65.883	1.8596	31.77	108.05	139.82	0.0682	0.2829	45
46	140.16	134.74	0.01521	0.52859	65.755	1.8918	32.16	107.72	139.88	0.0689	0.2826	46
47	142.51	137.01	0.01524	0.51962	65.625	1.9245	32.56	107.38	139.94	0.0697	0.2823	47
48	144.89	139.32	0.01527	0.51082	65.495	1.9576	32.96	107.04	140.00	0.0705	0.2820	48
49	147.30	141.65	0.01530	0.50219	65.365	1.9913	33.36	106.70	140.06	0.0713	0.2816	49
50	149.74	144.01	0.01533	0.49372	65.234	2.0254	33.76	106.36	140.12	0.0720	0.2813	50
51	152.21	146.40	0.01536	0.48542	65.103	2.0601	34.16	106.01	140.18	0.0728	0.2810	51
52	154.71	148.83	0.01539	0.47727	64.971	2.0952	34.57	105.67	140.23	0.0736	0.2807	52
53	157.24	151.28	0.01542	0.46928	64.838	2.1309	34.97	105.32	140.29	0.0744	0.2804	53

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54	159.80	153.76	0.01545	0.46144	64.705	2.1671	35.37	104.97	140.34	0.0751	0.2801	54
55	162.40	156.28	0.01549	0.45375	64.572	2.2039	35.78	104.62	140.39	0.0759	0.2798	55
56	165.02	158.82	0.01552	0.44620	64.437	2.2412	36.18	104.26	140.44	0.0767	0.2794	56
57	167.68	161.40	0.01555	0.43879	64.303	2.2790	36.59	103.90	140.49	0.0775	0.2791	57
58	170.36	164.00	0.01558	0.43152	64.167	2.3174	37.00	103.55	140.54	0.0782	0.2788	58
59	173.08	166.64	0.01562	0.42438	64.031	2.3564	37.40	103.19	140.59	0.0790	0.2785	59
60	175.84	169.31	0.01565	0.41738	63.895	2.3959	37.81	102.82	140.63	0.0798	0.2782	60
61	178.62	172.02	0.01568	0.41050	63.757	2.4361	38.22	102.46	140.68	0.0805	0.2779	61
62	181.44	174.75	0.01572	0.40375	63.619	2.4768	38.63	102.09	140.72	0.0813	0.2776	62
63	184.29	177.52	0.01575	0.39712	63.481	2.5181	39.04	101.72	140.76	0.0821	0.2773	63
64	187.17	180.32	0.01579	0.39061	63.342	2.5601	39.46	101.35	140.80	0.0829	0.2769	64
65	190.09	183.16	0.01582	0.38422	63.202	2.6027	39.87	100.97	140.84	0.0836	0.2766	65
66	193.04	186.02	0.01586	0.37794	63.061	2.6459	40.28	100.60	140.88	0.0844	0.2763	66
67	196.03	188.93	0.01589	0.37178	62.920	2.6898	40.70	100.22	140.92	0.0852	0.2760	67
68	199.05	191.86	0.01593	0.36572	62.778	2.7343	41.11	99.84	140.95	0.0859	0.2757	68
69	202.11	194.83	0.01597	0.35977	62.636	2.7795	41.53	99.45	140.98	0.0867	0.2754	69
70	205.20	197.84	0.01600	0.35393	62.492	2.8254	41.95	99.07	141.02	0.0875	0.2751	70
71	208.32	200.88	0.01604	0.34819	62.348	2.8720	42.37	98.68	141.05	0.0883	0.2747	71
72	211.48	203.95	0.01608	0.34255	62.204	2.9192	42.79	98.29	141.07	0.0890	0.2744	72
73	214.68	207.06	0.01611	0.33701	62.058	2.9672	43.21	97.89	141.10	0.0898	0.2741	73
74	217.91	210.21	0.01615	0.33157	61.912	3.0160	43.63	97.49	141.13	0.0906	0.2738	74
75	221.18	213.39	0.01619	0.32622	61.765	3.0654	44.06	97.09	141.15	0.0914	0.2735	75
76	224.49	216.61	0.01623	0.32096	61.617	3.1156	44.48	96.69	141.17	0.0921	0.2731	76
77	227.83	219.87	0.01627	0.31580	61.468	3.1666	44.90	96.29	141.19	0.0929	0.2728	77
78	231.21	223.16	0.01631	0.31072	61.319	3.2184	45.33	95.88	141.21	0.0937	0.2725	78
79	234.62	226.49	0.01635	0.30572	61.168	3.2709	45.76	95.47	141.23	0.0945	0.2722	79
80	238.08	229.86	0.01639	0.30082	61.017	3.3243	46.19	95.06	141.24	0.0952	0.2719	80
81	241.57	233.26	0.01643	0.29599	60.865	3.3785	46.62	94.64	141.26	0.0960	0.2715	81
82	245.10	236.71	0.01647	0.29125	60.712	3.4335	47.05	94.22	141.27	0.0968	0.2712	82
83	248.67	240.19	0.01651	0.28658	60.559	3.4894	47.48	93.80	141.28	0.0976	0.2709	83
84	252.27	243.71	0.01656	0.28200	60.404	3.5462	47.91	93.37	141.29	0.0983	0.2706	84
85	255.92	247.27	0.01660	0.27748	60.248	3.6038	48.35	92.94	141.29	0.0991	0.2702	85
86	259.60	250.87	0.01664	0.27305	60.092	3.6624	48.79	92.51	141.30	0.0999	0.2699	86
87	263.33	254.51	0.01668	0.26868	59.934	3.7218	49.22	92.08	141.30	0.1007	0.2696	87
88	267.09	258.18	0.01673	0.26439	59.776	3.7823	49.66	91.64	141.30	0.1015	0.2692	88
89	270.90	261.90	0.01677	0.26017	59.616	3.8436	50.10	91.20	141.30	0.1022	0.2689	89
90	274.74	265.66	0.01682	0.25602	59.456	3.9060	50.54	90.75	141.29	0.1030	0.2686	90
91	278.63	269.46	0.01687	0.25193	59.294	3.9694	50.99	90.30	141.29	0.1038	0.2682	91
92	282.55	273.30	0.01691	0.24791	59.131	4.0338	51.43	89.85	141.28	0.1046	0.2679	92
93	286.52	277.19	0.01696	0.24395	58.968	4.0992	51.88	89.39	141.27	0.1054	0.2676	93
94	290.53	281.11	0.01701	0.24006	58.803	4.1657	52.32	88.93	141.26	0.1062	0.2672	94
95	294.58	285.08	0.01705	0.23623	58.637	4.2333	52.77	88.47	141.24	0.1069	0.2669	95
96	298.67	289.09	0.01710	0.23245	58.470	4.3019	53.22	88.00	141.22	0.1077	0.2665	96
97	302.81	293.14	0.01715	0.22874	58.301	4.3718	53.67	87.53	141.21	0.1085	0.2662	97
98	306.99	297.24	0.01720	0.22509	58.132	4.4427	54.13	87.06	141.18	0.1093	0.2658	98
99	311.21	301.38	0.01725	0.22149	57.961	4.5149	54.58	86.58	141.16	0.1101	0.2655	99
100	315.47	305.56	0.01730	0.21795	57.789	4.5883	55.04	86.10	141.13	0.1109	0.2651	100
101	319.78	309.79	0.01736	0.21446	57.616	4.6629	55.49	85.61	141.10	0.1117	0.2648	101
102	324.13	314.06	0.01741	0.21102	57.441	4.7388	55.95	85.12	141.07	0.1125	0.2644	102
103	328.53	318.38	0.01746	0.20764	57.265	4.8160	56.42	84.62	141.04	0.1133	0.2641	103
104	332.97	322.74	0.01752	0.20431	57.087	4.8946	56.88	84.12	141.00	0.1141	0.2637	104
105	337.46	327.15	0.01757	0.20103	56.908	4.9744	57.34	83.61	140.96	0.1149	0.2633	105
106	341.99	331.60	0.01763	0.19780	56.728	5.0557	57.81	83.10	140.92	0.1157	0.2630	106
107	346.57	336.10	0.01768	0.19461	56.546	5.1385	58.28	82.59	140.87	0.1165	0.2626	107
108	351.19	340.65	0.01774	0.19147	56.363	5.2226	58.75	82.07	140.82	0.1173	0.2622	108
109	355.86	345.25	0.01780	0.18838	56.178	5.3083	59.22	81.55	140.77	0.1181	0.2619	109
110	360.57	349.89	0.01786	0.18534	55.991	5.3956	59.70	81.02	140.72	0.1189	0.2615	110

Opteon™ XL41 (R-454B)
Saturation Properties - Temperature Table

Temp °F	Pressure [psia]		Volume [ft ³ /lb]		Density [lb/ft ³]		Enthalpy [BTU/lb]			Entropy [BTU/lb·°R]		Temp °F
	Liquid P _l	Vapor P _g	Liquid v _l	Vapor v _g	Liquid d _l	Vapor d _g	Liquid h _l	Latent h _{lg}	Vapor h _g	Liquid s _l	Vapor s _g	
111	365.33	354.58	0.01792	0.18234	55.803	5.4844	60.18	80.48	140.66	0.1197	0.2611	111
112	370.14	359.32	0.01798	0.17938	55.613	5.5749	60.66	79.94	140.60	0.1205	0.2607	112
113	375.00	364.11	0.01804	0.17646	55.421	5.6670	61.14	79.39	140.53	0.1213	0.2603	113
114	379.90	368.95	0.01811	0.17359	55.227	5.7608	61.62	78.84	140.46	0.1221	0.2599	114
115	384.86	373.83	0.01817	0.17075	55.032	5.8564	62.11	78.29	140.39	0.1230	0.2595	115
116	389.86	378.77	0.01824	0.16796	54.835	5.9539	62.59	77.72	140.32	0.1238	0.2591	116
117	394.91	383.76	0.01830	0.16520	54.635	6.0532	63.09	77.15	140.24	0.1246	0.2587	117
118	400.01	388.80	0.01837	0.16248	54.434	6.1544	63.58	76.58	140.16	0.1254	0.2583	118
119	405.16	393.89	0.01844	0.15980	54.230	6.2576	64.07	75.99	140.07	0.1262	0.2579	119
120	410.36	399.03	0.01851	0.15716	54.024	6.3629	64.57	75.40	139.98	0.1271	0.2575	120
121	415.60	404.22	0.01858	0.15455	53.816	6.4703	65.07	74.81	139.88	0.1279	0.2571	121
122	420.90	409.47	0.01865	0.15198	53.606	6.5798	65.58	74.21	139.78	0.1287	0.2566	122
123	426.26	414.77	0.01873	0.14944	53.393	6.6917	66.09	73.60	139.68	0.1296	0.2562	123
124	431.66	420.13	0.01880	0.14693	53.178	6.8058	66.60	72.98	139.57	0.1304	0.2558	124
125	437.11	425.53	0.01888	0.14446	52.961	6.9223	67.11	72.35	139.46	0.1313	0.2553	125
126	442.62	431.00	0.01896	0.14202	52.740	7.0413	67.62	71.72	139.34	0.1321	0.2549	126
127	448.18	436.52	0.01904	0.13961	52.517	7.1629	68.14	71.08	139.22	0.1330	0.2544	127
128	453.79	442.09	0.01912	0.13723	52.291	7.2872	68.67	70.43	139.10	0.1338	0.2540	128
129	459.45	447.72	0.01921	0.13488	52.062	7.4142	69.19	69.77	138.96	0.1347	0.2535	129
130	465.17	453.41	0.01929	0.13255	51.830	7.5441	69.72	69.10	138.83	0.1356	0.2530	130
131	470.95	459.15	0.01938	0.13026	51.595	7.6769	70.26	68.42	138.68	0.1364	0.2526	131
132	476.77	464.95	0.01947	0.12799	51.356	7.8129	70.80	67.74	138.53	0.1373	0.2521	132
133	482.66	470.82	0.01956	0.12575	51.114	7.9522	71.34	67.04	138.38	0.1382	0.2516	133
134	488.60	476.74	0.01966	0.12354	50.869	8.0947	71.88	66.33	138.22	0.1391	0.2511	134
135	494.59	482.72	0.01976	0.12135	50.620	8.2408	72.43	65.61	138.05	0.1400	0.2506	135
136	500.64	488.76	0.01985	0.11918	50.367	8.3905	72.99	64.89	137.87	0.1408	0.2500	136
137	506.75	494.86	0.01996	0.11704	50.109	8.5440	73.55	64.14	137.69	0.1418	0.2495	137
138	512.91	501.03	0.02006	0.11492	49.848	8.7015	74.11	63.39	137.50	0.1427	0.2490	138
139	519.13	507.25	0.02017	0.11283	49.582	8.8632	74.68	62.62	137.31	0.1436	0.2484	139
140	525.41	513.54	0.02028	0.11075	49.312	9.0293	75.26	61.84	137.10	0.1445	0.2479	140
141	531.75	519.89	0.02039	0.10870	49.036	9.2000	75.84	61.05	136.89	0.1454	0.2473	141
142	538.15	526.31	0.02051	0.10666	48.756	9.3755	76.43	60.24	136.67	0.1464	0.2467	142
143	544.61	532.80	0.02063	0.10464	48.470	9.5562	77.02	59.41	136.43	0.1473	0.2461	143
144	551.13	539.34	0.02076	0.10265	48.178	9.7422	77.62	58.57	136.19	0.1483	0.2455	144
145	557.70	545.96	0.02089	0.10066	47.880	9.9340	78.23	57.72	135.94	0.1492	0.2449	145
146	564.34	552.65	0.02102	0.09870	47.576	10.1317	78.84	56.84	135.68	0.1502	0.2443	146
147	571.04	559.40	0.02116	0.09675	47.266	10.3359	79.46	55.94	135.41	0.1512	0.2436	147
148	577.81	566.22	0.02130	0.09481	46.948	10.5470	80.09	55.03	135.12	0.1522	0.2429	148
149	584.63	573.12	0.02145	0.09289	46.623	10.7653	80.73	54.09	134.82	0.1532	0.2422	149
150	591.52	580.09	0.02160	0.09098	46.289	10.9914	81.38	53.13	134.51	0.1542	0.2415	150
151	598.48	587.13	0.02176	0.08908	45.947	11.2259	82.04	52.14	134.18	0.1552	0.2408	151
152	605.49	594.24	0.02193	0.08719	45.596	11.4695	82.71	51.13	133.84	0.1563	0.2401	152
153	612.58	601.43	0.02211	0.08530	45.234	11.7227	83.39	50.09	133.48	0.1573	0.2393	153
154	619.73	608.70	0.02229	0.08343	44.862	11.9865	84.08	49.02	133.10	0.1584	0.2385	154
155	626.94	616.05	0.02248	0.08155	44.478	12.2619	84.79	47.92	132.70	0.1595	0.2376	155
156	634.22	623.48	0.02269	0.07968	44.081	12.5498	85.51	46.77	132.28	0.1606	0.2368	156
157	641.57	630.99	0.02290	0.07781	43.670	12.8516	86.24	45.59	131.84	0.1618	0.2359	157
158	648.99	638.58	0.02312	0.07594	43.244	13.1688	87.00	44.37	131.37	0.1630	0.2350	158
159	656.48	646.27	0.02336	0.07406	42.801	13.5031	87.77	43.10	130.87	0.1642	0.2340	159
160	664.04	654.04	0.02362	0.07217	42.338	13.8566	88.57	41.77	130.34	0.1654	0.2329	160
161	671.67	661.90	0.02389	0.07026	41.854	14.2320	89.39	40.38	129.77	0.1667	0.2319	161
162	679.37	669.86	0.02419	0.06834	41.345	14.6325	90.24	38.92	129.16	0.1680	0.2307	162
163	687.14	677.92	0.02451	0.06639	40.808	15.0621	91.12	37.38	128.50	0.1693	0.2295	163
164	694.98	686.08	0.02485	0.06441	40.237	15.5260	92.05	35.74	127.78	0.1708	0.2282	164
165	702.90	694.36	0.02524	0.06238	39.626	16.0311	93.01	33.99	127.00	0.1723	0.2268	165

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	10			14.696			15			20			Temp °F
	-70.44 °F			-57.09 °F			-56.35 °F			-45.61 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	6.4462	127.6	0.330	4.4921	129.4	0.323	4.4065	129.5	0.322	3.3612	130.8	0.317	
-70	6.4547	127.7	0.330										-70
-65	6.5506	128.7	0.333										-65
-60	6.6456	129.6	0.335										-60
-55	6.7400	130.6	0.337	4.5202	129.8	0.324	4.4243	129.7	0.323				-55
-50	6.8336	131.5	0.340	4.5870	130.8	0.326	4.4900	130.8	0.325				-50
-45	6.9268	132.5	0.342	4.6532	131.8	0.329	4.5550	131.7	0.328	3.3674	131.0	0.317	-45
-40	7.0194	133.4	0.344	4.7188	132.8	0.331	4.6195	132.7	0.330	3.4181	132.0	0.320	-40
-35	7.1116	134.4	0.347	4.7839	133.8	0.333	4.6834	133.7	0.333	3.4681	133.0	0.322	-35
-30	7.2034	135.3	0.349	4.8485	134.7	0.336	4.7469	134.7	0.335	3.5176	134.1	0.325	-30
-25	7.2948	136.3	0.351	4.9128	135.7	0.338	4.8099	135.7	0.337	3.5666	135.1	0.327	-25
-20	7.3859	137.2	0.353	4.9766	136.7	0.340	4.8726	136.7	0.339	3.6152	136.1	0.329	-20
-15	7.4767	138.2	0.355	5.0402	137.7	0.342	4.9350	137.7	0.342	3.6634	137.1	0.332	-15
-10	7.5672	139.2	0.358	5.1034	138.7	0.345	4.9971	138.6	0.344	3.7114	138.1	0.334	-10
-5	7.6574	140.1	0.360	5.1664	139.6	0.347	5.0588	139.6	0.346	3.7590	139.1	0.336	-5
0	7.7474	141.1	0.362	5.2291	140.6	0.349	5.1204	140.6	0.348	3.8064	140.1	0.338	0
5	7.8372	142.0	0.364	5.2916	141.6	0.351	5.1817	141.6	0.350	3.8535	141.1	0.340	5
10	7.9268	143.0	0.366	5.3538	142.6	0.353	5.2428	142.6	0.352	3.9004	142.1	0.343	10
15	8.0162	144.0	0.368	5.4159	143.6	0.355	5.3037	143.6	0.354	3.9470	143.1	0.345	15
20	8.1054	145.0	0.370	5.4778	144.6	0.357	5.3644	144.6	0.357	3.9935	144.1	0.347	20
25	8.1945	145.9	0.372	5.5395	145.6	0.359	5.4249	145.5	0.359	4.0398	145.1	0.349	25
30	8.2834	146.9	0.374	5.6011	146.6	0.361	5.4853	146.5	0.361	4.0860	146.2	0.351	30
35	8.3721	147.9	0.376	5.6625	147.6	0.363	5.5455	147.5	0.363	4.1320	147.2	0.353	35
40	8.4608	148.9	0.378	5.7238	148.6	0.365	5.6056	148.5	0.365	4.1778	148.2	0.355	40
45	8.5493	149.9	0.380	5.7849	149.6	0.367	5.6656	149.6	0.367	4.2236	149.2	0.357	45
50	8.6376	150.9	0.382	5.8459	150.6	0.369	5.7254	150.6	0.369	4.2691	150.2	0.359	50
55	8.7259	151.9	0.384	5.9068	151.6	0.371	5.7852	151.6	0.371	4.3146	151.2	0.361	55
60	8.8141	152.9	0.386	5.9676	152.6	0.373	5.8448	152.6	0.373	4.3600	152.3	0.363	60
65	8.9021	153.9	0.388	6.0283	153.6	0.375	5.9043	153.6	0.375	4.4052	153.3	0.365	65
70	8.9901	154.9	0.390	6.0890	154.7	0.377	5.9637	154.6	0.377	4.4504	154.3	0.367	70
75	9.0780	156.0	0.392	6.1495	155.7	0.379	6.0231	155.7	0.378	4.4955	155.4	0.369	75

ABSOLUTE PRESSURE, psia													
Temp °F	25			30			35			40			Temp °F
	-36.82 °F			-29.31 °F			-22.73 °F			-16.84 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	2.7226	131.9	0.3129	2.2906	132.8	0.3096	1.9783	133.6	0.3068	1.7416	134.3	0.3044	
-35	2.7377	132.3	0.3138										-35
-30	2.7790	133.4	0.3163										-30
-25	2.8197	134.4	0.3187	2.3211	133.8	0.3118							-25
-20	2.8600	135.5	0.3211	2.3559	134.9	0.3142	1.9952	134.2	0.3082				-20
-15	2.8999	136.5	0.3235	2.3903	135.9	0.3166	2.0257	135.3	0.3107	1.7518	134.7	0.3053	-15
-10	2.9394	137.5	0.3258	2.4243	137.0	0.3190	2.0558	136.4	0.3131	1.7791	135.8	0.3079	-10
-5	2.9786	138.6	0.3280	2.4579	138.0	0.3214	2.0856	137.5	0.3155	1.8059	136.9	0.3104	-5
0	3.0175	139.6	0.3303	2.4912	139.1	0.3237	2.1150	138.6	0.3179	1.8324	138.0	0.3128	0
5	3.0562	140.6	0.3325	2.5243	140.1	0.3259	2.1440	139.6	0.3202	1.8586	139.1	0.3151	5
10	3.0946	141.7	0.3347	2.5570	141.2	0.3282	2.1728	140.7	0.3225	1.8844	140.2	0.3175	10
15	3.1327	142.7	0.3369	2.5896	142.2	0.3304	2.2014	141.8	0.3247	1.9100	141.3	0.3198	15
20	3.1707	143.7	0.3390	2.6219	143.3	0.3325	2.2297	142.8	0.3270	1.9354	142.4	0.3220	20
25	3.2085	144.7	0.3411	2.6541	144.3	0.3347	2.2579	143.9	0.3292	1.9605	143.5	0.3243	25
30	3.2462	145.8	0.3432	2.6861	145.4	0.3368	2.2858	144.9	0.3313	1.9855	144.5	0.3265	30
35	3.2836	146.8	0.3453	2.7179	146.4	0.3390	2.3136	146.0	0.3335	2.0102	145.6	0.3286	35
40	3.3210	147.8	0.3474	2.7495	147.4	0.3411	2.3412	147.1	0.3356	2.0348	146.7	0.3308	40
45	3.3581	148.8	0.3495	2.7810	148.5	0.3431	2.3687	148.1	0.3377	2.0593	147.7	0.3329	45
50	3.3952	149.9	0.3515	2.8124	149.5	0.3452	2.3960	149.2	0.3398	2.0836	148.8	0.3350	50
55	3.4321	150.9	0.3535	2.8437	150.6	0.3472	2.4232	150.2	0.3419	2.1078	149.9	0.3371	55
60	3.4690	152.0	0.3555	2.8748	151.6	0.3493	2.4503	151.3	0.3439	2.1319	151.0	0.3392	60
65	3.5057	153.0	0.3575	2.9058	152.7	0.3513	2.4773	152.4	0.3459	2.1558	152.0	0.3413	65
70	3.5423	154.0	0.3595	2.9368	153.7	0.3533	2.5042	153.4	0.3480	2.1796	153.1	0.3433	70
75	3.5788	155.1	0.3615	2.9676	154.8	0.3553	2.5310	154.5	0.3500	2.2034	154.2	0.3453	75
80	3.6153	156.1	0.3634	2.9984	155.8	0.3572	2.5576	155.6	0.3520	2.2270	155.3	0.3473	80
85	3.6516	157.2	0.3654	3.0290	156.9	0.3592	2.5842	156.6	0.3539	2.2506	156.3	0.3493	85
90	3.6879	158.2	0.3673	3.0596	158.0	0.3612	2.6108	157.7	0.3559	2.2741	157.4	0.3513	90
95	3.7241	159.3	0.3692	3.0901	159.0	0.3631	2.6372	158.8	0.3578	2.2975	158.5	0.3533	95
100	3.7602	160.4	0.3711	3.1205	160.1	0.3650	2.6636	159.9	0.3598	2.3208	159.6	0.3552	100
105	3.7963	161.4	0.3730	3.1509	161.2	0.3669	2.6899	160.9	0.3617	2.3440	160.7	0.3571	105
110	3.8323	162.5	0.3749	3.1812	162.3	0.3688	2.7161	162.0	0.3636	2.3672	161.8	0.3591	110

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	45			50			55			60			Temp °F
	-11.49 °F			-6.59 °F			-2.05 °F			2.18 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	1.5559	134.8	0.302	1.4061	135.4	0.300	1.2826	135.8	0.299	1.1790	136.3	0.297	
-10	1.5633	135.2	0.303										-10
-5	1.5880	136.3	0.306	1.4133	135.7	0.301							-5
0	1.6123	137.5	0.308	1.4359	136.9	0.304	1.2913	136.3	0.300				0
5	1.6362	138.6	0.311	1.4581	138.1	0.306	1.3121	137.5	0.302	1.1901	137.0	0.299	5
10	1.6598	139.7	0.313	1.4799	139.2	0.309	1.3325	138.7	0.305	1.2094	138.2	0.301	10
15	1.6831	140.8	0.315	1.5014	140.3	0.311	1.3526	139.8	0.307	1.2283	139.3	0.304	15
20	1.7062	141.9	0.318	1.5227	141.5	0.314	1.3724	141.0	0.310	1.2469	140.5	0.306	20
25	1.7291	143.0	0.320	1.5437	142.6	0.316	1.3919	142.1	0.312	1.2653	141.7	0.309	25
30	1.7517	144.1	0.322	1.5645	143.7	0.318	1.4112	143.3	0.314	1.2834	142.8	0.311	30
35	1.7741	145.2	0.324	1.5851	144.8	0.320	1.4304	144.4	0.317	1.3013	144.0	0.313	35
40	1.7964	146.3	0.326	1.6056	145.9	0.323	1.4493	145.5	0.319	1.3189	145.1	0.316	40
45	1.8185	147.4	0.329	1.6258	147.0	0.325	1.4680	146.6	0.321	1.3365	146.2	0.318	45
50	1.8405	148.5	0.331	1.6459	148.1	0.327	1.4866	147.7	0.323	1.3538	147.3	0.320	50
55	1.8623	149.5	0.333	1.6659	149.2	0.329	1.5051	148.8	0.325	1.3710	148.5	0.322	55
60	1.8841	150.6	0.335	1.6857	150.3	0.331	1.5234	149.9	0.328	1.3881	149.6	0.324	60
65	1.9057	151.7	0.337	1.7055	151.4	0.333	1.5416	151.0	0.330	1.4050	150.7	0.327	65
70	1.9271	152.8	0.339	1.7251	152.5	0.335	1.5597	152.1	0.332	1.4218	151.8	0.329	70
75	1.9485	153.9	0.341	1.7446	153.6	0.337	1.5777	153.2	0.334	1.4385	152.9	0.331	75
80	1.9698	155.0	0.343	1.7640	154.7	0.339	1.5955	154.4	0.336	1.4551	154.0	0.333	80
85	1.9910	156.0	0.345	1.7833	155.8	0.341	1.6133	155.5	0.338	1.4716	155.2	0.335	85
90	2.0121	157.1	0.347	1.8025	156.9	0.343	1.6310	156.6	0.340	1.4880	156.3	0.337	90
95	2.0332	158.2	0.349	1.8217	158.0	0.345	1.6486	157.7	0.342	1.5043	157.4	0.339	95
100	2.0541	159.3	0.351	1.8408	159.1	0.347	1.6661	158.8	0.344	1.5206	158.5	0.341	100
105	2.0750	160.4	0.353	1.8598	160.2	0.349	1.6836	159.9	0.346	1.5368	159.6	0.343	105
110	2.0958	161.5	0.355	1.8787	161.3	0.351	1.7010	161.0	0.348	1.5529	160.8	0.345	110
115	2.1166	162.6	0.357	1.8976	162.4	0.353	1.7183	162.1	0.350	1.5689	161.9	0.347	115
120	2.1373	163.7	0.359	1.9164	163.5	0.355	1.7356	163.3	0.352	1.5849	163.0	0.349	120
125	2.1579	164.8	0.361	1.9351	164.6	0.357	1.7528	164.4	0.354	1.6008	164.1	0.351	125
130	2.1785	166.0	0.363	1.9538	165.7	0.359	1.7699	165.5	0.356	1.6166	165.3	0.353	130
135	2.1991	167.1	0.365	1.9724	166.9	0.361	1.7870	166.6	0.358	1.6325	166.4	0.355	135

ABSOLUTE PRESSURE, psia													
Temp °F	65			70			75			80			Temp °F
	6.15 °F			9.90 °F			13.44 °F			16.81 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	1.0909	136.7	0.2958	1.0149	137.0	0.2944	0.9487	137.3	0.2932	0.8905	137.7	0.2921	
10	1.1050	137.6	0.2978	1.0153	137.0	0.2945							10
15	1.1230	138.8	0.3004	1.0325	138.3	0.2971	0.9538	137.7	0.2941				15
20	1.1406	140.0	0.3029	1.0493	139.5	0.2997	0.9700	139.0	0.2967	0.9004	138.5	0.2938	20
25	1.1579	141.2	0.3053	1.0658	140.7	0.3022	0.9858	140.2	0.2993	0.9156	139.7	0.2964	25
30	1.1750	142.4	0.3077	1.0820	141.9	0.3047	1.0013	141.5	0.3017	0.9306	141.0	0.2990	30
35	1.1919	143.5	0.3101	1.0980	143.1	0.3071	1.0166	142.7	0.3042	0.9452	142.2	0.3014	35
40	1.2085	144.7	0.3124	1.1138	144.3	0.3094	1.0316	143.8	0.3066	0.9596	143.4	0.3039	40
45	1.2250	145.8	0.3147	1.1294	145.4	0.3117	1.0464	145.0	0.3089	0.9738	144.6	0.3063	45
50	1.2413	147.0	0.3169	1.1448	146.6	0.3140	1.0611	146.2	0.3112	0.9878	145.8	0.3086	50
55	1.2575	148.1	0.3191	1.1601	147.7	0.3162	1.0756	147.4	0.3135	1.0016	147.0	0.3109	55
60	1.2735	149.2	0.3213	1.1752	148.9	0.3185	1.0899	148.5	0.3158	1.0152	148.2	0.3132	60
65	1.2893	150.4	0.3235	1.1901	150.0	0.3206	1.1041	149.7	0.3180	1.0287	149.3	0.3154	65
70	1.3051	151.5	0.3256	1.2049	151.2	0.3228	1.1181	150.8	0.3201	1.0421	150.5	0.3176	70
75	1.3207	152.6	0.3277	1.2197	152.3	0.3249	1.1321	152.0	0.3223	1.0554	151.6	0.3198	75
80	1.3362	153.7	0.3298	1.2343	153.4	0.3271	1.1459	153.1	0.3244	1.0685	152.8	0.3220	80
85	1.3516	154.9	0.3319	1.2488	154.6	0.3292	1.1596	154.3	0.3266	1.0815	154.0	0.3241	85
90	1.3670	156.0	0.3340	1.2632	155.7	0.3312	1.1732	155.4	0.3286	1.0944	155.1	0.3262	90
95	1.3822	157.1	0.3360	1.2775	156.8	0.3333	1.1867	156.5	0.3307	1.1073	156.3	0.3283	95
100	1.3974	158.2	0.3380	1.2918	158.0	0.3353	1.2002	157.7	0.3328	1.1200	157.4	0.3303	100
105	1.4125	159.4	0.3400	1.3059	159.1	0.3373	1.2136	158.8	0.3348	1.1327	158.6	0.3324	105
110	1.4275	160.5	0.3420	1.3200	160.2	0.3393	1.2268	160.0	0.3368	1.1453	159.7	0.3344	110
115	1.4425	161.6	0.3440	1.3340	161.4	0.3413	1.2401	161.1	0.3388	1.1578	160.9	0.3364	115
120	1.4573	162.8	0.3460	1.3480	162.5	0.3433	1.2532	162.3	0.3408	1.1703	162.0	0.3384	120
125	1.4722	163.9	0.3479	1.3619	163.7	0.3453	1.2663	163.4	0.3428	1.1827	163.2	0.3404	125
130	1.4869	165.0	0.3498	1.3757	164.8	0.3472	1.2793	164.6	0.3447	1.1950	164.3	0.3424	130
135	1.5017	166.2	0.3518	1.3895	165.9	0.3491	1.2923	165.7	0.3467	1.2073	165.5	0.3443	135
140	1.5163	167.3	0.3537	1.4033	167.1	0.3511	1.3052	166.9	0.3486	1.2195	166.6	0.3463	140
145	1.5309	168.5	0.3556	1.4169	168.2	0.3530	1.3181	168.0	0.3505	1.2316	167.8	0.3482	145
150	1.5455	169.6	0.3575	1.4306	169.4	0.3549	1.3310	169.2	0.3524	1.2438	169.0	0.3501	150
155	1.5600	170.8	0.3594	1.4442	170.6	0.3568	1.3437	170.3	0.3543	1.2558	170.1	0.3520	155

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	85			90			95			100			Temp °F
	20.02 °F			23.09 °F			26.03 °F			28.86 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.8389	137.9	0.291	0.7928	138.2	0.290	0.7514	138.4	0.289	0.7140	138.7	0.288	
25	0.8536	139.2	0.294	0.7983	138.7	0.291							25
30	0.8680	140.5	0.296	0.8122	140.0	0.294	0.7622	139.5	0.291	0.7170	139.0	0.289	30
35	0.8821	141.7	0.299	0.8259	141.3	0.296	0.7755	140.8	0.294	0.7300	140.3	0.291	35
40	0.8959	143.0	0.301	0.8393	142.5	0.299	0.7884	142.1	0.296	0.7426	141.6	0.294	40
45	0.9096	144.2	0.304	0.8524	143.8	0.301	0.8012	143.3	0.299	0.7549	142.9	0.297	45
50	0.9230	145.4	0.306	0.8653	145.0	0.304	0.8136	144.6	0.301	0.7671	144.2	0.299	50
55	0.9362	146.6	0.308	0.8780	146.2	0.306	0.8259	145.8	0.304	0.7790	145.4	0.302	55
60	0.9493	147.8	0.311	0.8906	147.4	0.308	0.8380	147.0	0.306	0.7907	146.6	0.304	60
65	0.9622	149.0	0.313	0.9030	148.6	0.311	0.8500	148.2	0.308	0.8022	147.9	0.306	65
70	0.9750	150.1	0.315	0.9153	149.8	0.313	0.8618	149.4	0.311	0.8136	149.1	0.309	70
75	0.9876	151.3	0.317	0.9274	151.0	0.315	0.8734	150.6	0.313	0.8248	150.3	0.311	75
80	1.0002	152.5	0.320	0.9394	152.2	0.317	0.8850	151.8	0.315	0.8359	151.5	0.313	80
85	1.0126	153.6	0.322	0.9513	153.3	0.320	0.8964	153.0	0.317	0.8469	152.7	0.315	85
90	1.0249	154.8	0.324	0.9631	154.5	0.322	0.9077	154.2	0.320	0.8578	153.9	0.317	90
95	1.0371	156.0	0.326	0.9747	155.7	0.324	0.9189	155.4	0.322	0.8686	155.1	0.320	95
100	1.0493	157.1	0.328	0.9863	156.8	0.326	0.9300	156.6	0.324	0.8793	156.3	0.322	100
105	1.0613	158.3	0.330	0.9979	158.0	0.328	0.9410	157.7	0.326	0.8899	157.5	0.324	105
110	1.0733	159.5	0.332	1.0093	159.2	0.330	0.9520	158.9	0.328	0.9004	158.6	0.326	110
115	1.0852	160.6	0.334	1.0206	160.4	0.332	0.9629	160.1	0.330	0.9108	159.8	0.328	115
120	1.0970	161.8	0.336	1.0319	161.5	0.334	0.9737	161.3	0.332	0.9212	161.0	0.330	120
125	1.1088	162.9	0.338	1.0432	162.7	0.336	0.9844	162.4	0.334	0.9315	162.2	0.332	125
130	1.1205	164.1	0.340	1.0543	163.9	0.338	0.9951	163.6	0.336	0.9417	163.4	0.334	130
135	1.1322	165.3	0.342	1.0654	165.0	0.340	1.0057	164.8	0.338	0.9519	164.6	0.336	135
140	1.1438	166.4	0.344	1.0765	166.2	0.342	1.0162	166.0	0.340	0.9620	165.7	0.338	140
145	1.1553	167.6	0.346	1.0875	167.4	0.344	1.0268	167.1	0.342	0.9721	166.9	0.340	145
150	1.1668	168.8	0.348	1.0984	168.5	0.346	1.0372	168.3	0.344	0.9821	168.1	0.342	150
155	1.1783	169.9	0.350	1.1093	169.7	0.348	1.0476	169.5	0.346	0.9921	169.3	0.344	155
160	1.1897	171.1	0.352	1.1202	170.9	0.350	1.0580	170.7	0.348	1.0020	170.5	0.346	160
165	1.2011	172.3	0.354	1.1310	172.1	0.352	1.0683	171.9	0.350	1.0119	171.7	0.348	165
170	1.2124	173.5	0.356	1.1418	173.3	0.353	1.0786	173.1	0.352	1.0217	172.9	0.350	170

ABSOLUTE PRESSURE, psia													
Temp °F	105			110			115			120			Temp °F
	31.58 °F			34.20 °F			36.74 °F			39.19 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.6801	138.9	0.2872	0.6491	139.1	0.2863	0.6207	139.3	0.2855	0.5946	139.4	0.2847	
35	0.6887	139.8	0.2891	0.6511	139.3	0.2868							35
40	0.7010	141.1	0.2917	0.6631	140.7	0.2895	0.6284	140.2	0.2873	0.5965	139.7	0.2852	40
45	0.7131	142.5	0.2944	0.6749	142.0	0.2922	0.6399	141.5	0.2900	0.6078	141.1	0.2880	45
50	0.7248	143.7	0.2969	0.6864	143.3	0.2948	0.6512	142.9	0.2927	0.6188	142.4	0.2906	50
55	0.7364	145.0	0.2994	0.6976	144.6	0.2973	0.6622	144.2	0.2952	0.6296	143.7	0.2932	55
60	0.7477	146.3	0.3018	0.7087	145.9	0.2997	0.6729	145.5	0.2977	0.6401	145.1	0.2958	60
65	0.7589	147.5	0.3042	0.7195	147.1	0.3021	0.6835	146.7	0.3002	0.6504	146.4	0.2983	65
70	0.7699	148.7	0.3065	0.7302	148.4	0.3045	0.6939	148.0	0.3026	0.6606	147.6	0.3007	70
75	0.7808	150.0	0.3088	0.7408	149.6	0.3068	0.7041	149.3	0.3049	0.6705	148.9	0.3031	75
80	0.7915	151.2	0.3111	0.7512	150.8	0.3091	0.7142	150.5	0.3072	0.6804	150.2	0.3054	80
85	0.8022	152.4	0.3133	0.7614	152.1	0.3114	0.7242	151.7	0.3095	0.6900	151.4	0.3077	85
90	0.8127	153.6	0.3155	0.7716	153.3	0.3136	0.7341	153.0	0.3118	0.6996	152.6	0.3100	90
95	0.8231	154.8	0.3177	0.7816	154.5	0.3158	0.7438	154.2	0.3140	0.7091	153.9	0.3122	95
100	0.8334	156.0	0.3198	0.7916	155.7	0.3180	0.7534	155.4	0.3162	0.7184	155.1	0.3144	100
105	0.8436	157.2	0.3219	0.8014	156.9	0.3201	0.7630	156.6	0.3183	0.7277	156.3	0.3166	105
110	0.8537	158.4	0.3241	0.8112	158.1	0.3222	0.7724	157.8	0.3204	0.7368	157.5	0.3187	110
115	0.8637	159.6	0.3261	0.8209	159.3	0.3243	0.7818	159.0	0.3226	0.7459	158.8	0.3209	115
120	0.8737	160.8	0.3282	0.8305	160.5	0.3264	0.7911	160.2	0.3246	0.7549	160.0	0.3230	120
125	0.8836	161.9	0.3302	0.8401	161.7	0.3284	0.8003	161.4	0.3267	0.7638	161.2	0.3250	125
130	0.8935	163.1	0.3323	0.8496	162.9	0.3305	0.8095	162.6	0.3288	0.7727	162.4	0.3271	130
135	0.9032	164.3	0.3343	0.8590	164.1	0.3325	0.8185	163.8	0.3308	0.7815	163.6	0.3291	135
140	0.9130	165.5	0.3363	0.8683	165.3	0.3345	0.8276	165.0	0.3328	0.7902	164.8	0.3312	140
145	0.9226	166.7	0.3382	0.8776	166.5	0.3365	0.8366	166.2	0.3348	0.7989	166.0	0.3332	145
150	0.9322	167.9	0.3402	0.8869	167.7	0.3385	0.8455	167.4	0.3368	0.8075	167.2	0.3352	150
155	0.9418	169.1	0.3421	0.8961	168.9	0.3404	0.8543	168.6	0.3387	0.8161	168.4	0.3371	155
160	0.9513	170.3	0.3441	0.9052	170.1	0.3423	0.8632	169.9	0.3407	0.8246	169.6	0.3391	160
165	0.9608	171.5	0.3460	0.9144	171.3	0.3443	0.8719	171.1	0.3426	0.8331	170.9	0.3410	165
170	0.9702	172.7	0.3479	0.9234	172.5	0.3462	0.8807	172.3	0.3446	0.8415	172.1	0.3430	170
175	0.9796	173.9	0.3498	0.9324	173.7	0.3481	0.8894	173.5	0.3465	0.8499	173.3	0.3449	175
180	0.9890	175.1	0.3517	0.9414	174.9	0.3500	0.8980	174.7	0.3484	0.8582	174.5	0.3468	180

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	125			130			135			140			Temp °F
	41.57 °F			43.88 °F			46.12 °F			48.29 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.5705	139.6	0.284	0.5482	139.7	0.283	0.5275	139.9	0.283	0.5083	140.0	0.282	
45	0.5782	140.6	0.286	0.5507	140.1	0.284							45
50	0.5890	142.0	0.289	0.5614	141.5	0.287	0.5357	141.0	0.285	0.5118	140.5	0.283	50
55	0.5995	143.3	0.291	0.5717	142.9	0.289	0.5459	142.4	0.288	0.5219	142.0	0.286	55
60	0.6098	144.6	0.294	0.5819	144.2	0.292	0.5559	143.8	0.290	0.5317	143.4	0.288	60
65	0.6199	146.0	0.296	0.5917	145.6	0.295	0.5656	145.2	0.293	0.5412	144.7	0.291	65
70	0.6298	147.3	0.299	0.6014	146.9	0.297	0.5751	146.5	0.295	0.5506	146.1	0.294	70
75	0.6396	148.5	0.301	0.6109	148.2	0.299	0.5844	147.8	0.298	0.5597	147.4	0.296	75
80	0.6491	149.8	0.304	0.6203	149.5	0.302	0.5936	149.1	0.300	0.5687	148.7	0.299	80
85	0.6586	151.1	0.306	0.6295	150.7	0.304	0.6026	150.4	0.303	0.5775	150.0	0.301	85
90	0.6679	152.3	0.308	0.6386	152.0	0.307	0.6114	151.7	0.305	0.5862	151.3	0.303	90
95	0.6771	153.6	0.310	0.6476	153.3	0.309	0.6202	152.9	0.307	0.5947	152.6	0.306	95
100	0.6862	154.8	0.313	0.6564	154.5	0.311	0.6288	154.2	0.309	0.6031	153.9	0.308	100
105	0.6952	156.0	0.315	0.6651	155.7	0.313	0.6373	155.4	0.312	0.6115	155.1	0.310	105
110	0.7041	157.3	0.317	0.6738	157.0	0.315	0.6458	156.7	0.314	0.6197	156.4	0.312	110
115	0.7129	158.5	0.319	0.6824	158.2	0.318	0.6541	157.9	0.316	0.6278	157.7	0.315	115
120	0.7216	159.7	0.321	0.6908	159.4	0.320	0.6623	159.2	0.318	0.6359	158.9	0.317	120
125	0.7303	160.9	0.323	0.6992	160.7	0.322	0.6705	160.4	0.320	0.6438	160.1	0.319	125
130	0.7388	162.1	0.325	0.7076	161.9	0.324	0.6786	161.6	0.322	0.6517	161.4	0.321	130
135	0.7474	163.4	0.328	0.7158	163.1	0.326	0.6867	162.9	0.324	0.6595	162.6	0.323	135
140	0.7558	164.6	0.330	0.7240	164.3	0.328	0.6946	164.1	0.327	0.6673	163.9	0.325	140
145	0.7642	165.8	0.332	0.7322	165.6	0.330	0.7025	165.3	0.329	0.6750	165.1	0.327	145
150	0.7726	167.0	0.334	0.7403	166.8	0.332	0.7104	166.6	0.331	0.6826	166.3	0.329	150
155	0.7808	168.2	0.336	0.7483	168.0	0.334	0.7182	167.8	0.333	0.6902	167.6	0.331	155
160	0.7891	169.4	0.338	0.7563	169.2	0.336	0.7259	169.0	0.335	0.6977	168.8	0.333	160
165	0.7973	170.6	0.339	0.7642	170.4	0.338	0.7337	170.2	0.337	0.7052	170.0	0.335	165
170	0.8054	171.9	0.341	0.7721	171.7	0.340	0.7413	171.5	0.339	0.7127	171.2	0.337	170
175	0.8135	173.1	0.343	0.7800	172.9	0.342	0.7489	172.7	0.340	0.7201	172.5	0.339	175
180	0.8216	174.3	0.345	0.7878	174.1	0.344	0.7565	173.9	0.342	0.7274	173.7	0.341	180
185	0.8297	175.5	0.347	0.7956	175.3	0.346	0.7640	175.1	0.344	0.7347	175.0	0.343	185
190	0.8377	176.7	0.349	0.8033	176.6	0.348	0.7715	176.4	0.346	0.7420	176.2	0.345	190

ABSOLUTE PRESSURE, psia													
Temp °F	145			150			155			160			Temp °F
	50.41 °F			52.48 °F			54.49 °F			56.46 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.4903	140.1	0.2812	0.4734	140.3	0.2805	0.4576	140.4	0.2799	0.4428	140.5	0.2793	
55	0.4994	141.5	0.2838	0.4784	141.0	0.2820	0.4586	140.5	0.2802				55
60	0.5091	142.9	0.2866	0.4880	142.5	0.2848	0.4681	142.0	0.2831	0.4494	141.5	0.2814	60
65	0.5185	144.3	0.2893	0.4972	143.9	0.2876	0.4773	143.5	0.2859	0.4585	143.0	0.2842	65
70	0.5277	145.7	0.2919	0.5063	145.3	0.2902	0.4862	144.9	0.2886	0.4674	144.5	0.2869	70
75	0.5367	147.0	0.2944	0.5151	146.7	0.2928	0.4950	146.3	0.2912	0.4760	145.9	0.2896	75
80	0.5455	148.4	0.2969	0.5238	148.0	0.2953	0.5035	147.6	0.2937	0.4844	147.3	0.2922	80
85	0.5541	149.7	0.2993	0.5323	149.3	0.2978	0.5118	149.0	0.2962	0.4926	148.6	0.2947	85
90	0.5626	151.0	0.3017	0.5406	150.7	0.3002	0.5200	150.3	0.2986	0.5007	150.0	0.2972	90
95	0.5710	152.3	0.3040	0.5488	152.0	0.3025	0.5281	151.6	0.3010	0.5086	151.3	0.2996	95
100	0.5792	153.6	0.3063	0.5569	153.3	0.3048	0.5360	152.9	0.3034	0.5164	152.6	0.3019	100
105	0.5874	154.8	0.3086	0.5649	154.5	0.3071	0.5438	154.2	0.3057	0.5240	153.9	0.3043	105
110	0.5954	156.1	0.3109	0.5727	155.8	0.3094	0.5515	155.5	0.3080	0.5316	155.2	0.3066	110
115	0.6033	157.4	0.3131	0.5805	157.1	0.3116	0.5591	156.8	0.3102	0.5390	156.5	0.3088	115
120	0.6112	158.6	0.3152	0.5882	158.4	0.3138	0.5666	158.1	0.3124	0.5464	157.8	0.3110	120
125	0.6190	159.9	0.3174	0.5957	159.6	0.3160	0.5740	159.4	0.3146	0.5536	159.1	0.3132	125
130	0.6267	161.1	0.3195	0.6033	160.9	0.3181	0.5814	160.6	0.3167	0.5608	160.4	0.3154	130
135	0.6343	162.4	0.3216	0.6107	162.1	0.3202	0.5886	161.9	0.3189	0.5679	161.6	0.3175	135
140	0.6418	163.6	0.3237	0.6181	163.4	0.3223	0.5958	163.1	0.3210	0.5750	162.9	0.3197	140
145	0.6493	164.9	0.3257	0.6254	164.6	0.3244	0.6030	164.4	0.3230	0.5819	164.1	0.3217	145
150	0.6568	166.1	0.3278	0.6326	165.9	0.3264	0.6100	165.6	0.3251	0.5888	165.4	0.3238	150
155	0.6642	167.3	0.3298	0.6398	167.1	0.3285	0.6171	166.9	0.3271	0.5957	166.7	0.3259	155
160	0.6715	168.6	0.3318	0.6470	168.4	0.3305	0.6240	168.1	0.3292	0.6025	167.9	0.3279	160
165	0.6788	169.8	0.3338	0.6541	169.6	0.3325	0.6309	169.4	0.3312	0.6093	169.2	0.3299	165
170	0.6860	171.0	0.3358	0.6611	170.8	0.3345	0.6378	170.6	0.3332	0.6160	170.4	0.3319	170
175	0.6932	172.3	0.3377	0.6681	172.1	0.3364	0.6446	171.9	0.3351	0.6226	171.7	0.3339	175
180	0.7003	173.5	0.3397	0.6751	173.3	0.3384	0.6514	173.1	0.3371	0.6292	172.9	0.3359	180
185	0.7075	174.8	0.3416	0.6820	174.6	0.3403	0.6582	174.4	0.3390	0.6358	174.2	0.3378	185
190	0.7145	176.0	0.3435	0.6889	175.8	0.3422	0.6649	175.6	0.3410	0.6423	175.4	0.3398	190
195	0.7216	177.2	0.3454	0.6957	177.1	0.3441	0.6715	176.9	0.3429	0.6488	176.7	0.3417	195
200	0.7286	178.5	0.3473	0.7025	178.3	0.3460	0.6782	178.1	0.3448	0.6553	177.9	0.3436	200

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	165			170			175			180			Temp °F
	58.38 °F			60.26 °F			62.09 °F			63.89 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.4288	140.6	0.279	0.4156	140.6	0.278	0.4031	140.7	0.278	0.3913	140.8	0.277	
60	0.4318	141.1	0.280										60
65	0.4408	142.6	0.283	0.4241	142.1	0.281	0.4083	141.6	0.279	0.3933	141.2	0.278	65
70	0.4496	144.0	0.285	0.4328	143.6	0.284	0.4169	143.2	0.282	0.4019	142.7	0.281	70
75	0.4581	145.5	0.288	0.4413	145.1	0.286	0.4253	144.6	0.285	0.4102	144.2	0.283	75
80	0.4664	146.9	0.291	0.4495	146.5	0.289	0.4334	146.1	0.288	0.4182	145.7	0.286	80
85	0.4745	148.3	0.293	0.4575	147.9	0.292	0.4413	147.5	0.290	0.4261	147.1	0.289	85
90	0.4825	149.6	0.296	0.4653	149.3	0.294	0.4491	148.9	0.293	0.4337	148.5	0.291	90
95	0.4902	151.0	0.298	0.4729	150.6	0.297	0.4566	150.3	0.295	0.4412	149.9	0.294	95
100	0.4979	152.3	0.301	0.4805	152.0	0.299	0.4640	151.6	0.298	0.4485	151.3	0.296	100
105	0.5054	153.6	0.303	0.4879	153.3	0.302	0.4713	153.0	0.300	0.4557	152.7	0.299	105
110	0.5128	154.9	0.305	0.4952	154.6	0.304	0.4785	154.3	0.303	0.4627	154.0	0.301	110
115	0.5201	156.2	0.307	0.5023	155.9	0.306	0.4855	155.6	0.305	0.4697	155.4	0.304	115
120	0.5273	157.5	0.310	0.5094	157.2	0.308	0.4925	157.0	0.307	0.4765	156.7	0.306	120
125	0.5345	158.8	0.312	0.5164	158.5	0.311	0.4994	158.3	0.309	0.4833	158.0	0.308	125
130	0.5415	160.1	0.314	0.5233	159.8	0.313	0.5061	159.6	0.312	0.4899	159.3	0.310	130
135	0.5485	161.4	0.316	0.5301	161.1	0.315	0.5128	160.9	0.314	0.4965	160.6	0.313	135
140	0.5553	162.6	0.318	0.5369	162.4	0.317	0.5194	162.1	0.316	0.5030	161.9	0.315	140
145	0.5622	163.9	0.320	0.5436	163.7	0.319	0.5260	163.4	0.318	0.5094	163.2	0.317	145
150	0.5689	165.2	0.323	0.5502	164.9	0.321	0.5325	164.7	0.320	0.5158	164.5	0.319	150
155	0.5756	166.4	0.325	0.5567	166.2	0.323	0.5389	166.0	0.322	0.5221	165.7	0.321	155
160	0.5823	167.7	0.327	0.5632	167.5	0.325	0.5453	167.3	0.324	0.5283	167.0	0.323	160
165	0.5889	169.0	0.329	0.5697	168.7	0.327	0.5516	168.5	0.326	0.5345	168.3	0.325	165
170	0.5954	170.2	0.331	0.5761	170.0	0.329	0.5579	169.8	0.328	0.5406	169.6	0.327	170
175	0.6019	171.5	0.333	0.5825	171.3	0.331	0.5641	171.1	0.330	0.5467	170.9	0.329	175
180	0.6084	172.7	0.335	0.5888	172.5	0.333	0.5703	172.3	0.332	0.5528	172.1	0.331	180
185	0.6148	174.0	0.337	0.5950	173.8	0.335	0.5764	173.6	0.334	0.5588	173.4	0.333	185
190	0.6212	175.2	0.339	0.6013	175.1	0.337	0.5825	174.9	0.336	0.5647	174.7	0.335	190
195	0.6275	176.5	0.340	0.6075	176.3	0.339	0.5885	176.1	0.338	0.5707	175.9	0.337	195
200	0.6338	177.8	0.342	0.6136	177.6	0.341	0.5946	177.4	0.340	0.5766	177.2	0.339	200
205	0.6401	179.0	0.344	0.6197	178.8	0.343	0.6005	178.7	0.342	0.5824	178.5	0.341	205

ABSOLUTE PRESSURE, psia													
Temp °F	185			190			195			200			Temp °F
	65.64 °F			67.37 °F			69.06 °F			70.71 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.3802	140.9	0.2764	0.3695	140.9	0.2759	0.3594	141.0	0.2753	0.3498	141.0	0.2748	
70	0.3876	142.2	0.2790	0.3740	141.8	0.2775	0.3610	141.3	0.2759				70
75	0.3959	143.8	0.2819	0.3822	143.3	0.2804	0.3692	142.9	0.2789	0.3568	142.4	0.2774	75
80	0.4038	145.3	0.2847	0.3902	144.9	0.2833	0.3771	144.4	0.2818	0.3647	144.0	0.2804	80
85	0.4116	146.7	0.2874	0.3979	146.3	0.2860	0.3848	145.9	0.2846	0.3723	145.5	0.2832	85
90	0.4192	148.2	0.2900	0.4053	147.8	0.2886	0.3922	147.4	0.2873	0.3797	147.0	0.2859	90
95	0.4265	149.6	0.2926	0.4126	149.2	0.2912	0.3994	148.9	0.2899	0.3869	148.5	0.2886	95
100	0.4338	151.0	0.2951	0.4198	150.6	0.2938	0.4065	150.3	0.2925	0.3938	149.9	0.2912	100
105	0.4408	152.3	0.2975	0.4268	152.0	0.2962	0.4134	151.7	0.2950	0.4007	151.4	0.2937	105
110	0.4478	153.7	0.2999	0.4336	153.4	0.2986	0.4202	153.1	0.2974	0.4074	152.8	0.2962	110
115	0.4546	155.1	0.3023	0.4404	154.7	0.3010	0.4268	154.4	0.2998	0.4139	154.1	0.2986	115
120	0.4614	156.4	0.3046	0.4470	156.1	0.3033	0.4334	155.8	0.3021	0.4204	155.5	0.3009	120
125	0.4680	157.7	0.3069	0.4535	157.4	0.3056	0.4398	157.1	0.3044	0.4267	156.9	0.3033	125
130	0.4745	159.0	0.3091	0.4600	158.8	0.3079	0.4462	158.5	0.3067	0.4330	158.2	0.3056	130
135	0.4810	160.3	0.3113	0.4663	160.1	0.3101	0.4524	159.8	0.3090	0.4392	159.5	0.3078	135
140	0.4874	161.6	0.3135	0.4726	161.4	0.3123	0.4586	161.1	0.3112	0.4452	160.9	0.3100	140
145	0.4937	162.9	0.3156	0.4788	162.7	0.3145	0.4647	162.4	0.3134	0.4513	162.2	0.3122	145
150	0.4999	164.2	0.3178	0.4850	164.0	0.3166	0.4707	163.7	0.3155	0.4572	163.5	0.3144	150
155	0.5061	165.5	0.3199	0.4910	165.3	0.3187	0.4767	165.1	0.3176	0.4631	164.8	0.3165	155
160	0.5123	166.8	0.3220	0.4970	166.6	0.3208	0.4826	166.4	0.3197	0.4689	166.1	0.3187	160
165	0.5183	168.1	0.3240	0.5030	167.9	0.3229	0.4884	167.6	0.3218	0.4746	167.4	0.3208	165
170	0.5243	169.4	0.3261	0.5089	169.2	0.3250	0.4942	168.9	0.3239	0.4803	168.7	0.3228	170
175	0.5303	170.6	0.3281	0.5148	170.4	0.3270	0.5000	170.2	0.3259	0.4859	170.0	0.3249	175
180	0.5362	171.9	0.3301	0.5206	171.7	0.3290	0.5057	171.5	0.3280	0.4915	171.3	0.3269	180
185	0.5421	173.2	0.3321	0.5263	173.0	0.3310	0.5113	172.8	0.3300	0.4971	172.6	0.3289	185
190	0.5480	174.5	0.3341	0.5320	174.3	0.3330	0.5170	174.1	0.3319	0.5026	173.9	0.3309	190
195	0.5538	175.8	0.3360	0.5377	175.6	0.3350	0.5225	175.4	0.3339	0.5081	175.2	0.3329	195
200	0.5595	177.0	0.3380	0.5434	176.8	0.3369	0.5281	176.7	0.3359	0.5135	176.5	0.3349	200
205	0.5652	178.3	0.3399	0.5490	178.1	0.3388	0.5336	178.0	0.3378	0.5189	177.8	0.3368	205
210	0.5709	179.6	0.3418	0.5546	179.4	0.3408	0.5390	179.2	0.3397	0.5243	179.1	0.3387	210
215	0.5766	180.9	0.3437	0.5601	180.7	0.3427	0.5445	180.5	0.3417	0.5296	180.4	0.3407	215

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	205			210			215			220			Temp °F
	72.34 °F			73.93 °F			75.50 °F			77.04 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.3407	141.1	0.274	0.3319	141.1	0.274	0.3236	141.2	0.273	0.3156	141.2	0.273	
75	0.3450	142.0	0.276	0.3336	141.5	0.274							75
80	0.3528	143.6	0.279	0.3415	143.1	0.278	0.3306	142.7	0.276	0.3202	142.2	0.275	80
85	0.3604	145.1	0.282	0.3490	144.7	0.280	0.3382	144.3	0.279	0.3277	143.8	0.278	85
90	0.3677	146.6	0.285	0.3563	146.2	0.283	0.3454	145.8	0.282	0.3350	145.4	0.281	90
95	0.3749	148.1	0.287	0.3634	147.7	0.286	0.3525	147.4	0.285	0.3420	147.0	0.283	95
100	0.3818	149.6	0.290	0.3703	149.2	0.289	0.3593	148.9	0.287	0.3488	148.5	0.286	100
105	0.3886	151.0	0.292	0.3770	150.7	0.291	0.3659	150.3	0.290	0.3554	150.0	0.289	105
110	0.3952	152.4	0.295	0.3835	152.1	0.294	0.3724	151.8	0.293	0.3618	151.4	0.291	110
115	0.4017	153.8	0.297	0.3900	153.5	0.296	0.3788	153.2	0.295	0.3681	152.9	0.294	115
120	0.4080	155.2	0.300	0.3963	154.9	0.299	0.3850	154.6	0.297	0.3743	154.3	0.296	120
125	0.4143	156.6	0.302	0.4025	156.3	0.301	0.3911	156.0	0.300	0.3803	155.7	0.299	125
130	0.4205	157.9	0.304	0.4085	157.6	0.303	0.3971	157.4	0.302	0.3863	157.1	0.301	130
135	0.4266	159.3	0.307	0.4145	159.0	0.306	0.4031	158.7	0.304	0.3921	158.5	0.303	135
140	0.4325	160.6	0.309	0.4204	160.3	0.308	0.4089	160.1	0.307	0.3979	159.8	0.306	140
145	0.4385	161.9	0.311	0.4263	161.7	0.310	0.4146	161.4	0.309	0.4035	161.2	0.308	145
150	0.4443	163.3	0.313	0.4320	163.0	0.312	0.4203	162.8	0.311	0.4091	162.5	0.310	150
155	0.4501	164.6	0.315	0.4377	164.3	0.314	0.4259	164.1	0.313	0.4147	163.9	0.312	155
160	0.4558	165.9	0.318	0.4433	165.7	0.317	0.4315	165.4	0.316	0.4201	165.2	0.315	160
165	0.4614	167.2	0.320	0.4489	167.0	0.319	0.4369	166.8	0.318	0.4255	166.5	0.317	165
170	0.4670	168.5	0.322	0.4544	168.3	0.321	0.4424	168.1	0.320	0.4309	167.9	0.319	170
175	0.4726	169.8	0.324	0.4599	169.6	0.323	0.4477	169.4	0.322	0.4361	169.2	0.321	175
180	0.4781	171.1	0.326	0.4653	170.9	0.325	0.4530	170.7	0.324	0.4414	170.5	0.323	180
185	0.4835	172.4	0.328	0.4706	172.2	0.327	0.4583	172.0	0.326	0.4466	171.8	0.325	185
190	0.4890	173.7	0.330	0.4760	173.5	0.329	0.4635	173.3	0.328	0.4517	173.1	0.327	190
195	0.4943	175.0	0.332	0.4812	174.8	0.331	0.4687	174.6	0.330	0.4568	174.4	0.329	195
200	0.4997	176.3	0.334	0.4865	176.1	0.333	0.4739	175.9	0.332	0.4619	175.7	0.331	200
205	0.5050	177.6	0.336	0.4917	177.4	0.335	0.4790	177.2	0.334	0.4669	177.0	0.333	205
210	0.5102	178.9	0.338	0.4968	178.7	0.337	0.4841	178.5	0.336	0.4719	178.3	0.335	210
215	0.5154	180.2	0.340	0.5020	180.0	0.339	0.4891	179.8	0.338	0.4768	179.7	0.337	215
220	0.5206	181.5	0.342	0.5071	181.3	0.341	0.4941	181.1	0.340	0.4818	181.0	0.339	220

ABSOLUTE PRESSURE, psia													
Temp °F	225			230			235			240			Temp °F
	78.55 °F			80.04 °F			81.51 °F			82.95 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.3079	141.2	0.2723	0.3006	141.2	0.2718	0.2936	141.3	0.2714	0.2868	141.3	0.2709	
80	0.3102	141.7	0.2733										80
85	0.3177	143.4	0.2763	0.3081	142.9	0.2750	0.2988	142.5	0.2736	0.2899	142.0	0.2722	85
90	0.3249	145.0	0.2793	0.3153	144.6	0.2780	0.3061	144.2	0.2767	0.2972	143.7	0.2754	90
95	0.3319	146.6	0.2821	0.3223	146.2	0.2809	0.3130	145.8	0.2796	0.3041	145.4	0.2784	95
100	0.3387	148.1	0.2849	0.3290	147.7	0.2837	0.3197	147.4	0.2825	0.3108	147.0	0.2812	100
105	0.3452	149.6	0.2876	0.3355	149.3	0.2864	0.3262	148.9	0.2852	0.3172	148.5	0.2840	105
110	0.3516	151.1	0.2902	0.3419	150.8	0.2890	0.3325	150.4	0.2879	0.3235	150.1	0.2867	110
115	0.3579	152.5	0.2927	0.3481	152.2	0.2916	0.3387	151.9	0.2904	0.3296	151.6	0.2893	115
120	0.3640	154.0	0.2952	0.3541	153.7	0.2941	0.3447	153.4	0.2930	0.3356	153.0	0.2919	120
125	0.3700	155.4	0.2976	0.3600	155.1	0.2965	0.3505	154.8	0.2954	0.3414	154.5	0.2944	125
130	0.3758	156.8	0.3000	0.3659	156.5	0.2989	0.3563	156.2	0.2979	0.3471	155.9	0.2968	130
135	0.3816	158.2	0.3023	0.3716	157.9	0.3013	0.3620	157.6	0.3002	0.3527	157.3	0.2992	135
140	0.3873	159.6	0.3046	0.3772	159.3	0.3036	0.3675	159.0	0.3026	0.3582	158.7	0.3016	140
145	0.3929	160.9	0.3069	0.3827	160.7	0.3059	0.3730	160.4	0.3049	0.3636	160.1	0.3039	145
150	0.3984	162.3	0.3091	0.3882	162.0	0.3081	0.3784	161.8	0.3071	0.3690	161.5	0.3062	150
155	0.4039	163.6	0.3113	0.3936	163.4	0.3104	0.3837	163.1	0.3094	0.3742	162.9	0.3084	155
160	0.4093	165.0	0.3135	0.3989	164.7	0.3125	0.3889	164.5	0.3116	0.3794	164.3	0.3106	160
165	0.4146	166.3	0.3157	0.4041	166.1	0.3147	0.3941	165.8	0.3137	0.3845	165.6	0.3128	165
170	0.4198	167.6	0.3178	0.4093	167.4	0.3168	0.3992	167.2	0.3159	0.3896	167.0	0.3149	170
175	0.4251	169.0	0.3199	0.4145	168.7	0.3189	0.4043	168.5	0.3180	0.3946	168.3	0.3171	175
180	0.4302	170.3	0.3220	0.4195	170.1	0.3210	0.4093	169.9	0.3201	0.3995	169.6	0.3192	180
185	0.4353	171.6	0.3240	0.4246	171.4	0.3231	0.4143	171.2	0.3222	0.4044	171.0	0.3213	185
190	0.4404	172.9	0.3261	0.4296	172.7	0.3251	0.4192	172.5	0.3242	0.4092	172.3	0.3233	190
195	0.4454	174.2	0.3281	0.4345	174.0	0.3272	0.4240	173.8	0.3262	0.4140	173.6	0.3254	195
200	0.4504	175.5	0.3301	0.4394	175.4	0.3292	0.4289	175.2	0.3283	0.4188	175.0	0.3274	200
205	0.4553	176.9	0.3320	0.4443	176.7	0.3311	0.4337	176.5	0.3303	0.4235	176.3	0.3294	205
210	0.4602	178.2	0.3340	0.4491	178.0	0.3331	0.4384	177.8	0.3322	0.4282	177.6	0.3314	210
215	0.4651	179.5	0.3360	0.4539	179.3	0.3351	0.4431	179.1	0.3342	0.4328	178.9	0.3333	215
220	0.4699	180.8	0.3379	0.4586	180.6	0.3370	0.4478	180.4	0.3361	0.4375	180.3	0.3353	220
225	0.4748	182.1	0.3398	0.4634	181.9	0.3389	0.4525	181.8	0.3381	0.4420	181.6	0.3372	225

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	245			250			255			260			Temp °F
	84.36 °F			85.76 °F			87.13 °F			88.49 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.2803	141.3	0.270	0.2741	141.3	0.270	0.2681	141.3	0.270	0.2623	141.3	0.269	
85	0.2813	141.5	0.271										85
90	0.2886	143.3	0.274	0.2803	142.8	0.273	0.2723	142.3	0.271	0.2645	141.9	0.270	90
95	0.2955	144.9	0.277	0.2872	144.5	0.276	0.2792	144.1	0.275	0.2715	143.6	0.273	95
100	0.3022	146.6	0.280	0.2939	146.2	0.279	0.2859	145.8	0.278	0.2782	145.3	0.276	100
105	0.3086	148.2	0.283	0.3003	147.8	0.282	0.2923	147.4	0.280	0.2846	147.0	0.279	105
110	0.3149	149.7	0.286	0.3065	149.3	0.284	0.2985	149.0	0.283	0.2908	148.6	0.282	110
115	0.3209	151.2	0.288	0.3126	150.9	0.287	0.3045	150.5	0.286	0.2968	150.2	0.285	115
120	0.3269	152.7	0.291	0.3185	152.4	0.290	0.3104	152.1	0.289	0.3026	151.7	0.288	120
125	0.3326	154.2	0.293	0.3242	153.9	0.292	0.3161	153.5	0.291	0.3083	153.2	0.290	125
130	0.3383	155.6	0.296	0.3298	155.3	0.295	0.3217	155.0	0.294	0.3138	154.7	0.293	130
135	0.3438	157.1	0.298	0.3353	156.8	0.297	0.3271	156.5	0.296	0.3192	156.2	0.295	135
140	0.3493	158.5	0.301	0.3407	158.2	0.300	0.3325	157.9	0.299	0.3245	157.6	0.298	140
145	0.3547	159.9	0.303	0.3460	159.6	0.302	0.3377	159.3	0.301	0.3297	159.1	0.300	145
150	0.3599	161.3	0.305	0.3512	161.0	0.304	0.3429	160.7	0.303	0.3348	160.5	0.302	150
155	0.3651	162.6	0.307	0.3564	162.4	0.306	0.3480	162.1	0.306	0.3399	161.9	0.305	155
160	0.3702	164.0	0.310	0.3614	163.8	0.309	0.3530	163.5	0.308	0.3448	163.3	0.307	160
165	0.3753	165.4	0.312	0.3664	165.1	0.311	0.3579	164.9	0.310	0.3497	164.7	0.309	165
170	0.3803	166.7	0.314	0.3714	166.5	0.313	0.3628	166.3	0.312	0.3545	166.0	0.311	170
175	0.3852	168.1	0.316	0.3762	167.9	0.315	0.3676	167.6	0.314	0.3593	167.4	0.313	175
180	0.3901	169.4	0.318	0.3810	169.2	0.317	0.3724	169.0	0.316	0.3640	168.8	0.316	180
185	0.3949	170.8	0.320	0.3858	170.6	0.319	0.3771	170.4	0.319	0.3686	170.1	0.318	185
190	0.3997	172.1	0.322	0.3905	171.9	0.322	0.3817	171.7	0.321	0.3732	171.5	0.320	190
195	0.4044	173.4	0.324	0.3952	173.3	0.324	0.3863	173.1	0.323	0.3778	172.9	0.322	195
200	0.4091	174.8	0.327	0.3998	174.6	0.326	0.3909	174.4	0.325	0.3823	174.2	0.324	200
205	0.4138	176.1	0.329	0.4044	175.9	0.328	0.3954	175.7	0.327	0.3868	175.5	0.326	205
210	0.4184	177.4	0.331	0.4090	177.3	0.330	0.3999	177.1	0.329	0.3912	176.9	0.328	210
215	0.4230	178.8	0.332	0.4135	178.6	0.332	0.4043	178.4	0.331	0.3956	178.2	0.330	215
220	0.4275	180.1	0.334	0.4179	179.9	0.334	0.4088	179.7	0.333	0.3999	179.6	0.332	220
225	0.4320	181.4	0.336	0.4224	181.3	0.336	0.4131	181.1	0.335	0.4043	180.9	0.334	225
230	0.4365	182.8	0.338	0.4268	182.6	0.337	0.4175	182.4	0.337	0.4085	182.2	0.336	230

ABSOLUTE PRESSURE, psia													
Temp °F	265			270			275			280			Temp °F
	89.82 °F			91.14 °F			92.44 °F			93.72 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.2567	141.3	0.2686	0.2514	141.3	0.2682	0.2462	141.3	0.2678	0.2412	141.3	0.2673	
90	0.2570	141.4	0.2688										90
95	0.2640	143.2	0.2720	0.2568	142.7	0.2708	0.2498	142.2	0.2695	0.2430	141.7	0.2682	95
100	0.2707	144.9	0.2752	0.2635	144.5	0.2740	0.2565	144.0	0.2727	0.2498	143.6	0.2715	100
105	0.2772	146.6	0.2782	0.2699	146.2	0.2770	0.2630	145.8	0.2758	0.2562	145.4	0.2747	105
110	0.2833	148.2	0.2810	0.2761	147.9	0.2799	0.2691	147.5	0.2788	0.2624	147.1	0.2777	110
115	0.2893	149.8	0.2838	0.2821	149.5	0.2827	0.2751	149.1	0.2816	0.2683	148.7	0.2806	115
120	0.2951	151.4	0.2865	0.2878	151.0	0.2855	0.2808	150.7	0.2844	0.2741	150.3	0.2834	120
125	0.3007	152.9	0.2891	0.2935	152.6	0.2881	0.2864	152.2	0.2871	0.2796	151.9	0.2861	125
130	0.3062	154.4	0.2917	0.2989	154.1	0.2907	0.2919	153.8	0.2897	0.2851	153.5	0.2887	130
135	0.3116	155.9	0.2942	0.3043	155.6	0.2932	0.2972	155.3	0.2922	0.2903	155.0	0.2913	135
140	0.3169	157.3	0.2966	0.3095	157.1	0.2957	0.3024	156.8	0.2947	0.2955	156.5	0.2938	140
145	0.3220	158.8	0.2990	0.3146	158.5	0.2981	0.3075	158.2	0.2972	0.3005	158.0	0.2962	145
150	0.3271	160.2	0.3014	0.3196	160.0	0.3005	0.3124	159.7	0.2995	0.3055	159.4	0.2986	150
155	0.3321	161.6	0.3037	0.3246	161.4	0.3028	0.3173	161.1	0.3019	0.3103	160.9	0.3010	155
160	0.3370	163.0	0.3060	0.3294	162.8	0.3051	0.3221	162.5	0.3042	0.3151	162.3	0.3033	160
165	0.3418	164.4	0.3082	0.3342	164.2	0.3073	0.3269	164.0	0.3065	0.3198	163.7	0.3056	165
170	0.3466	165.8	0.3104	0.3389	165.6	0.3096	0.3316	165.4	0.3087	0.3244	165.1	0.3078	170
175	0.3513	167.2	0.3126	0.3436	167.0	0.3117	0.3362	166.7	0.3109	0.3290	166.5	0.3101	175
180	0.3559	168.6	0.3148	0.3482	168.4	0.3139	0.3407	168.1	0.3131	0.3335	167.9	0.3122	180
185	0.3605	169.9	0.3169	0.3527	169.7	0.3161	0.3452	169.5	0.3152	0.3379	169.3	0.3144	185
190	0.3651	171.3	0.3190	0.3572	171.1	0.3182	0.3496	170.9	0.3173	0.3423	170.7	0.3165	190
195	0.3696	172.7	0.3211	0.3617	172.5	0.3203	0.3540	172.3	0.3194	0.3467	172.1	0.3186	195
200	0.3740	174.0	0.3231	0.3661	173.8	0.3223	0.3584	173.6	0.3215	0.3510	173.4	0.3207	200
205	0.3784	175.4	0.3252	0.3704	175.2	0.3244	0.3627	175.0	0.3236	0.3552	174.8	0.3228	205
210	0.3828	176.7	0.3272	0.3747	176.5	0.3264	0.3669	176.3	0.3256	0.3594	176.1	0.3248	210
215	0.3871	178.1	0.3292	0.3790	177.9	0.3284	0.3712	177.7	0.3276	0.3636	177.5	0.3268	215
220	0.3914	179.4	0.3312	0.3832	179.2	0.3304	0.3754	179.0	0.3296	0.3677	178.9	0.3289	220
225	0.3957	180.7	0.3332	0.3874	180.6	0.3324	0.3795	180.4	0.3316	0.3718	180.2	0.3308	225
230	0.3999	182.1	0.3351	0.3916	181.9	0.3343	0.3836	181.7	0.3336	0.3759	181.6	0.3328	230
235	0.4041	183.4	0.3370	0.3958	183.3	0.3363	0.3877	183.1	0.3355	0.3799	182.9	0.3348	235

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	285			290			295			300			Temp °F
	94.98 °F			96.23 °F			97.46 °F			98.67 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.2363	141.2	0.267	0.2316	141.2	0.266	0.2271	141.2	0.266	0.2227	141.2	0.266	
95	0.2363	141.3	0.267										95
100	0.2432	143.1	0.270	0.2368	142.7	0.269	0.2306	142.2	0.268	0.2245	141.7	0.267	100
105	0.2497	144.9	0.273	0.2433	144.5	0.272	0.2371	144.1	0.271	0.2311	143.6	0.270	105
110	0.2558	146.7	0.277	0.2495	146.3	0.275	0.2434	145.9	0.274	0.2374	145.4	0.273	110
115	0.2618	148.4	0.279	0.2555	148.0	0.278	0.2493	147.6	0.277	0.2433	147.2	0.276	115
120	0.2675	150.0	0.282	0.2612	149.6	0.281	0.2550	149.3	0.280	0.2491	148.9	0.279	120
125	0.2731	151.6	0.285	0.2667	151.2	0.284	0.2606	150.9	0.283	0.2546	150.5	0.282	125
130	0.2785	153.1	0.288	0.2721	152.8	0.287	0.2659	152.5	0.286	0.2599	152.2	0.285	130
135	0.2837	154.7	0.290	0.2773	154.4	0.289	0.2711	154.1	0.288	0.2651	153.7	0.287	135
140	0.2888	156.2	0.293	0.2824	155.9	0.292	0.2762	155.6	0.291	0.2702	155.3	0.290	140
145	0.2939	157.7	0.295	0.2874	157.4	0.294	0.2811	157.1	0.293	0.2751	156.8	0.293	145
150	0.2988	159.1	0.298	0.2923	158.9	0.297	0.2860	158.6	0.296	0.2799	158.3	0.295	150
155	0.3036	160.6	0.300	0.2971	160.3	0.299	0.2907	160.1	0.298	0.2846	159.8	0.297	155
160	0.3083	162.0	0.302	0.3018	161.8	0.302	0.2954	161.5	0.301	0.2893	161.3	0.300	160
165	0.3130	163.5	0.305	0.3064	163.2	0.304	0.3000	163.0	0.303	0.2938	162.7	0.302	165
170	0.3176	164.9	0.307	0.3109	164.6	0.306	0.3045	164.4	0.305	0.2983	164.2	0.304	170
175	0.3221	166.3	0.309	0.3154	166.1	0.308	0.3089	165.8	0.308	0.3027	165.6	0.307	175
180	0.3265	167.7	0.311	0.3198	167.5	0.311	0.3133	167.2	0.310	0.3070	167.0	0.309	180
185	0.3309	169.1	0.314	0.3242	168.9	0.313	0.3176	168.7	0.312	0.3113	168.4	0.311	185
190	0.3353	170.5	0.316	0.3285	170.3	0.315	0.3219	170.0	0.314	0.3155	169.8	0.313	190
195	0.3396	171.8	0.318	0.3327	171.6	0.317	0.3261	171.4	0.316	0.3197	171.2	0.316	195
200	0.3438	173.2	0.320	0.3369	173.0	0.319	0.3302	172.8	0.318	0.3238	172.6	0.318	200
205	0.3480	174.6	0.322	0.3411	174.4	0.321	0.3343	174.2	0.320	0.3278	174.0	0.320	205
210	0.3522	176.0	0.324	0.3452	175.8	0.323	0.3384	175.6	0.323	0.3319	175.4	0.322	210
215	0.3563	177.3	0.326	0.3493	177.1	0.325	0.3424	177.0	0.325	0.3359	176.8	0.324	215
220	0.3604	178.7	0.328	0.3533	178.5	0.327	0.3464	178.3	0.327	0.3398	178.2	0.326	220
225	0.3644	180.0	0.330	0.3573	179.9	0.329	0.3504	179.7	0.329	0.3437	179.5	0.328	225
230	0.3685	181.4	0.332	0.3613	181.2	0.331	0.3543	181.1	0.331	0.3476	180.9	0.330	230
235	0.3724	182.8	0.334	0.3652	182.6	0.333	0.3582	182.4	0.333	0.3514	182.3	0.332	235
240	0.3764	184.1	0.336	0.3691	184.0	0.335	0.3621	183.8	0.335	0.3553	183.6	0.334	240

ABSOLUTE PRESSURE, psia													
Temp °F	305			310			315			320			Temp °F
	99.87 °F			101.05 °F			102.22 °F			103.37 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.2184	141.1	0.2652	0.2143	141.1	0.2648	0.2103	141.1	0.2644	0.2064	141.0	0.2639	
100	0.2186	141.2	0.2653										100
105	0.2253	143.1	0.2688	0.2196	142.7	0.2676	0.2140	142.2	0.2663	0.2086	141.7	0.2651	105
110	0.2316	145.0	0.2720	0.2259	144.6	0.2709	0.2204	144.1	0.2698	0.2150	143.7	0.2686	110
115	0.2375	146.8	0.2752	0.2319	146.4	0.2741	0.2264	146.0	0.2730	0.2211	145.6	0.2719	115
120	0.2433	148.5	0.2781	0.2377	148.1	0.2771	0.2322	147.7	0.2761	0.2269	147.4	0.2750	120
125	0.2488	150.2	0.2810	0.2432	149.8	0.2800	0.2377	149.5	0.2790	0.2324	149.1	0.2780	125
130	0.2541	151.8	0.2838	0.2485	151.5	0.2828	0.2430	151.1	0.2819	0.2377	150.8	0.2809	130
135	0.2593	153.4	0.2865	0.2537	153.1	0.2856	0.2482	152.8	0.2846	0.2429	152.4	0.2837	135
140	0.2643	155.0	0.2891	0.2587	154.7	0.2882	0.2532	154.4	0.2873	0.2478	154.0	0.2864	140
145	0.2692	156.5	0.2917	0.2636	156.2	0.2908	0.2580	155.9	0.2899	0.2527	155.6	0.2890	145
150	0.2740	158.0	0.2942	0.2683	157.8	0.2933	0.2628	157.5	0.2924	0.2574	157.2	0.2916	150
155	0.2787	159.5	0.2966	0.2730	159.3	0.2958	0.2674	159.0	0.2949	0.2620	158.7	0.2941	155
160	0.2833	161.0	0.2990	0.2775	160.8	0.2982	0.2720	160.5	0.2973	0.2665	160.2	0.2965	160
165	0.2878	162.5	0.3014	0.2820	162.2	0.3005	0.2764	162.0	0.2997	0.2710	161.7	0.2989	165
170	0.2923	163.9	0.3037	0.2864	163.7	0.3029	0.2808	163.4	0.3021	0.2753	163.2	0.3013	170
175	0.2966	165.4	0.3060	0.2908	165.1	0.3052	0.2851	164.9	0.3044	0.2796	164.7	0.3036	175
180	0.3009	166.8	0.3082	0.2950	166.6	0.3074	0.2893	166.3	0.3066	0.2838	166.1	0.3059	180
185	0.3051	168.2	0.3104	0.2992	168.0	0.3096	0.2935	167.8	0.3089	0.2879	167.5	0.3081	185
190	0.3093	169.6	0.3126	0.3034	169.4	0.3118	0.2976	169.2	0.3111	0.2920	169.0	0.3103	190
195	0.3135	171.0	0.3147	0.3074	170.8	0.3140	0.3016	170.6	0.3132	0.2960	170.4	0.3125	195
200	0.3175	172.4	0.3169	0.3115	172.2	0.3161	0.3056	172.0	0.3154	0.2999	171.8	0.3147	200
205	0.3216	173.8	0.3190	0.3155	173.6	0.3182	0.3096	173.4	0.3175	0.3039	173.2	0.3168	205
210	0.3255	175.2	0.3211	0.3194	175.0	0.3203	0.3135	174.8	0.3196	0.3077	174.6	0.3189	210
215	0.3295	176.6	0.3231	0.3233	176.4	0.3224	0.3173	176.2	0.3217	0.3116	176.0	0.3210	215
220	0.3334	178.0	0.3251	0.3272	177.8	0.3244	0.3212	177.6	0.3237	0.3153	177.4	0.3230	220
225	0.3373	179.3	0.3272	0.3310	179.2	0.3265	0.3250	179.0	0.3258	0.3191	178.8	0.3251	225
230	0.3411	180.7	0.3292	0.3348	180.5	0.3285	0.3287	180.4	0.3278	0.3228	180.2	0.3271	230
235	0.3449	182.1	0.3312	0.3386	181.9	0.3305	0.3324	181.8	0.3298	0.3265	181.6	0.3291	235
240	0.3487	183.5	0.3331	0.3423	183.3	0.3324	0.3361	183.1	0.3317	0.3301	183.0	0.3311	240
245	0.3524	184.8	0.3351	0.3460	184.7	0.3344	0.3398	184.5	0.3337	0.3338	184.4	0.3330	245

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	325			330			335			340			Temp °F
	104.51 °F			105.64 °F			106.76 °F			107.86 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.2026	141.0	0.264	0.1989	140.9	0.263	0.1954	140.9	0.263	0.1919	140.8	0.262	
105	0.2033	141.2	0.264										105
110	0.2098	143.2	0.267	0.2047	142.7	0.266	0.1997	142.2	0.265	0.1948	141.7	0.264	110
115	0.2159	145.1	0.271	0.2108	144.7	0.270	0.2059	144.2	0.269	0.2010	143.8	0.267	115
120	0.2217	147.0	0.274	0.2167	146.5	0.273	0.2117	146.1	0.272	0.2069	145.7	0.271	120
125	0.2272	148.7	0.277	0.2222	148.3	0.276	0.2173	148.0	0.275	0.2125	147.6	0.274	125
130	0.2326	150.4	0.280	0.2275	150.1	0.279	0.2226	149.7	0.278	0.2179	149.3	0.277	130
135	0.2377	152.1	0.283	0.2327	151.8	0.282	0.2278	151.4	0.281	0.2230	151.1	0.280	135
140	0.2427	153.7	0.285	0.2376	153.4	0.285	0.2327	153.1	0.284	0.2280	152.8	0.283	140
145	0.2475	155.3	0.288	0.2424	155.0	0.287	0.2375	154.7	0.286	0.2328	154.4	0.285	145
150	0.2522	156.9	0.291	0.2471	156.6	0.290	0.2422	156.3	0.289	0.2374	156.0	0.288	150
155	0.2568	158.4	0.293	0.2517	158.2	0.292	0.2468	157.9	0.292	0.2420	157.6	0.291	155
160	0.2613	160.0	0.296	0.2562	159.7	0.295	0.2512	159.4	0.294	0.2464	159.1	0.293	160
165	0.2657	161.5	0.298	0.2605	161.2	0.297	0.2556	160.9	0.296	0.2507	160.7	0.296	165
170	0.2700	162.9	0.300	0.2648	162.7	0.300	0.2598	162.4	0.299	0.2549	162.2	0.298	170
175	0.2742	164.4	0.303	0.2690	164.2	0.302	0.2640	163.9	0.301	0.2591	163.7	0.300	175
180	0.2784	165.9	0.305	0.2732	165.6	0.304	0.2681	165.4	0.304	0.2632	165.2	0.303	180
185	0.2825	167.3	0.307	0.2772	167.1	0.307	0.2721	166.9	0.306	0.2672	166.6	0.305	185
190	0.2865	168.8	0.310	0.2812	168.5	0.309	0.2761	168.3	0.308	0.2711	168.1	0.307	190
195	0.2905	170.2	0.312	0.2852	170.0	0.311	0.2800	169.8	0.310	0.2750	169.6	0.310	195
200	0.2944	171.6	0.314	0.2891	171.4	0.313	0.2839	171.2	0.312	0.2789	171.0	0.312	200
205	0.2983	173.0	0.316	0.2929	172.8	0.315	0.2877	172.6	0.315	0.2827	172.4	0.314	205
210	0.3021	174.4	0.318	0.2967	174.2	0.317	0.2915	174.1	0.317	0.2864	173.9	0.316	210
215	0.3059	175.8	0.320	0.3005	175.7	0.320	0.2952	175.5	0.319	0.2901	175.3	0.318	215
220	0.3097	177.2	0.322	0.3042	177.1	0.322	0.2989	176.9	0.321	0.2937	176.7	0.320	220
225	0.3134	178.6	0.324	0.3079	178.5	0.324	0.3025	178.3	0.323	0.2973	178.1	0.322	225
230	0.3171	180.0	0.326	0.3115	179.9	0.326	0.3061	179.7	0.325	0.3009	179.5	0.324	230
235	0.3207	181.4	0.328	0.3151	181.2	0.328	0.3097	181.1	0.327	0.3045	180.9	0.326	235
240	0.3243	182.8	0.330	0.3187	182.6	0.330	0.3133	182.5	0.329	0.3080	182.3	0.328	240
245	0.3279	184.2	0.332	0.3223	184.0	0.332	0.3168	183.9	0.331	0.3114	183.7	0.330	245
250	0.3315	185.6	0.334	0.3258	185.4	0.334	0.3202	185.3	0.333	0.3149	185.1	0.332	250

ABSOLUTE PRESSURE, psia													
Temp °F	345			350			355			360			Temp °F
	108.95 °F			110.02 °F			111.09 °F			112.14 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1885	140.8	0.2619	0.1853	140.7	0.2615	0.1821	140.7	0.2611	0.1790	140.6	0.2607	
110	0.1899	141.2	0.2627										110
115	0.1963	143.3	0.2663	0.1917	142.8	0.2652	0.1871	142.4	0.2640	0.1827	141.9	0.2629	115
120	0.2023	145.3	0.2697	0.1977	144.8	0.2687	0.1932	144.4	0.2676	0.1888	143.9	0.2665	120
125	0.2079	147.2	0.2730	0.2033	146.8	0.2720	0.1989	146.3	0.2709	0.1945	145.9	0.2699	125
130	0.2132	149.0	0.2761	0.2087	148.6	0.2751	0.2043	148.2	0.2741	0.2000	147.8	0.2731	130
135	0.2184	150.7	0.2790	0.2139	150.4	0.2781	0.2094	150.0	0.2771	0.2051	149.6	0.2762	135
140	0.2233	152.4	0.2819	0.2188	152.1	0.2810	0.2144	151.7	0.2801	0.2101	151.4	0.2792	140
145	0.2281	154.1	0.2846	0.2236	153.8	0.2837	0.2192	153.4	0.2829	0.2149	153.1	0.2820	145
150	0.2328	155.7	0.2873	0.2282	155.4	0.2864	0.2238	155.1	0.2856	0.2195	154.8	0.2847	150
155	0.2373	157.3	0.2899	0.2327	157.0	0.2891	0.2283	156.7	0.2882	0.2240	156.4	0.2874	155
160	0.2417	158.9	0.2924	0.2371	158.6	0.2916	0.2327	158.3	0.2908	0.2284	158.0	0.2900	160
165	0.2460	160.4	0.2949	0.2414	160.1	0.2941	0.2370	159.9	0.2933	0.2326	159.6	0.2926	165
170	0.2502	161.9	0.2973	0.2456	161.7	0.2966	0.2411	161.4	0.2958	0.2368	161.2	0.2950	170
175	0.2543	163.4	0.2997	0.2497	163.2	0.2990	0.2452	163.0	0.2982	0.2408	162.7	0.2975	175
180	0.2584	164.9	0.3021	0.2538	164.7	0.3013	0.2492	164.5	0.3006	0.2448	164.2	0.2999	180
185	0.2624	166.4	0.3044	0.2577	166.2	0.3036	0.2532	166.0	0.3029	0.2487	165.7	0.3022	185
190	0.2663	167.9	0.3066	0.2616	167.7	0.3059	0.2570	167.4	0.3052	0.2526	167.2	0.3045	190
195	0.2702	169.3	0.3089	0.2654	169.1	0.3082	0.2608	168.9	0.3075	0.2564	168.7	0.3068	195
200	0.2740	170.8	0.3111	0.2692	170.6	0.3104	0.2646	170.4	0.3097	0.2601	170.2	0.3090	200
205	0.2777	172.2	0.3133	0.2729	172.0	0.3126	0.2683	171.8	0.3119	0.2638	171.6	0.3112	205
210	0.2814	173.7	0.3154	0.2766	173.5	0.3147	0.2719	173.3	0.3140	0.2674	173.1	0.3134	210
215	0.2851	175.1	0.3175	0.2802	174.9	0.3168	0.2755	174.7	0.3162	0.2710	174.5	0.3155	215
220	0.2887	176.5	0.3196	0.2838	176.3	0.3190	0.2791	176.1	0.3183	0.2745	175.9	0.3176	220
225	0.2923	177.9	0.3217	0.2874	177.7	0.3210	0.2826	177.6	0.3204	0.2780	177.4	0.3197	225
230	0.2958	179.3	0.3237	0.2909	179.2	0.3231	0.2861	179.0	0.3224	0.2814	178.8	0.3218	230
235	0.2993	180.7	0.3258	0.2944	180.6	0.3251	0.2895	180.4	0.3245	0.2848	180.2	0.3239	235
240	0.3028	182.1	0.3278	0.2978	182.0	0.3271	0.2929	181.8	0.3265	0.2882	181.6	0.3259	240
245	0.3063	183.5	0.3298	0.3012	183.4	0.3291	0.2963	183.2	0.3285	0.2916	183.0	0.3279	245
250	0.3097	184.9	0.3318	0.3046	184.8	0.3311	0.2997	184.6	0.3305	0.2949	184.5	0.3299	250
255	0.3131	186.3	0.3337	0.3080	186.2	0.3331	0.3030	186.0	0.3325	0.2982	185.9	0.3319	255

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	365			370			375			380			Temp °F
	113.19 °F			114.22 °F			115.24 °F			116.25 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1759	140.5	0.260	0.1730	140.4	0.260	0.1701	140.4	0.259	0.1673	140.3	0.259	
115	0.1783	141.3	0.262	0.1740	140.8	0.260							115
120	0.1845	143.5	0.265	0.1803	143.0	0.264	0.1762	142.5	0.263	0.1721	142.0	0.262	120
125	0.1903	145.5	0.269	0.1861	145.1	0.268	0.1821	144.6	0.267	0.1781	144.2	0.266	125
130	0.1958	147.4	0.272	0.1916	147.0	0.271	0.1876	146.6	0.270	0.1836	146.2	0.269	130
135	0.2009	149.3	0.275	0.1968	148.9	0.274	0.1928	148.5	0.273	0.1889	148.1	0.272	135
140	0.2059	151.1	0.278	0.2018	150.7	0.277	0.1978	150.3	0.276	0.1939	150.0	0.276	140
145	0.2107	152.8	0.281	0.2066	152.5	0.280	0.2026	152.1	0.279	0.1987	151.8	0.279	145
150	0.2153	154.5	0.284	0.2112	154.2	0.283	0.2072	153.8	0.282	0.2033	153.5	0.281	150
155	0.2198	156.1	0.287	0.2157	155.8	0.286	0.2117	155.5	0.285	0.2078	155.2	0.284	155
160	0.2241	157.7	0.289	0.2200	157.5	0.288	0.2160	157.2	0.288	0.2121	156.9	0.287	160
165	0.2284	159.3	0.292	0.2243	159.1	0.291	0.2203	158.8	0.290	0.2163	158.5	0.289	165
170	0.2325	160.9	0.294	0.2284	160.6	0.294	0.2244	160.4	0.293	0.2204	160.1	0.292	170
175	0.2366	162.5	0.297	0.2324	162.2	0.296	0.2284	161.9	0.295	0.2244	161.7	0.295	175
180	0.2405	164.0	0.299	0.2364	163.7	0.298	0.2323	163.5	0.298	0.2283	163.2	0.297	180
185	0.2444	165.5	0.301	0.2402	165.3	0.301	0.2362	165.0	0.300	0.2322	164.8	0.299	185
190	0.2483	167.0	0.304	0.2440	166.8	0.303	0.2399	166.5	0.302	0.2359	166.3	0.302	190
195	0.2520	168.5	0.306	0.2478	168.3	0.305	0.2436	168.0	0.305	0.2396	167.8	0.304	195
200	0.2557	170.0	0.308	0.2515	169.7	0.308	0.2473	169.5	0.307	0.2433	169.3	0.306	200
205	0.2594	171.4	0.311	0.2551	171.2	0.310	0.2509	171.0	0.309	0.2468	170.8	0.309	205
210	0.2630	172.9	0.313	0.2586	172.7	0.312	0.2544	172.5	0.311	0.2503	172.3	0.311	210
215	0.2665	174.3	0.315	0.2622	174.1	0.314	0.2579	173.9	0.314	0.2538	173.7	0.313	215
220	0.2700	175.8	0.317	0.2656	175.6	0.316	0.2614	175.4	0.316	0.2572	175.2	0.315	220
225	0.2735	177.2	0.319	0.2691	177.0	0.318	0.2648	176.8	0.318	0.2606	176.6	0.317	225
230	0.2769	178.6	0.321	0.2725	178.4	0.321	0.2682	178.3	0.320	0.2640	178.1	0.319	230
235	0.2803	180.0	0.323	0.2758	179.9	0.323	0.2715	179.7	0.322	0.2673	179.5	0.321	235
240	0.2836	181.5	0.325	0.2791	181.3	0.325	0.2748	181.1	0.324	0.2705	181.0	0.323	240
245	0.2869	182.9	0.327	0.2824	182.7	0.327	0.2780	182.6	0.326	0.2738	182.4	0.325	245
250	0.2902	184.3	0.329	0.2857	184.1	0.329	0.2813	184.0	0.328	0.2770	183.8	0.327	250
255	0.2935	185.7	0.331	0.2889	185.5	0.331	0.2845	185.4	0.330	0.2802	185.2	0.329	255
260	0.2967	187.1	0.333	0.2921	187.0	0.333	0.2877	186.8	0.332	0.2833	186.7	0.331	260

ABSOLUTE PRESSURE, psia													
Temp °F	385			390			395			400			Temp °F
	117.25 °F			118.24 °F			119.22 °F			120.19 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1645	140.2	0.2586	0.1618	140.1	0.2582	0.1592	140.0	0.2578	0.1567	140.0	0.2574	
120	0.1681	141.5	0.2609	0.1641	141.0	0.2597	0.1603	140.4	0.2585				120
125	0.1741	143.7	0.2646	0.1703	143.2	0.2636	0.1665	142.7	0.2625	0.1628	142.2	0.2613	125
130	0.1798	145.8	0.2682	0.1760	145.3	0.2671	0.1722	144.9	0.2661	0.1686	144.4	0.2651	130
135	0.1851	147.7	0.2715	0.1813	147.3	0.2705	0.1776	146.9	0.2696	0.1740	146.5	0.2686	135
140	0.1901	149.6	0.2746	0.1864	149.2	0.2737	0.1827	148.9	0.2728	0.1791	148.5	0.2719	140
145	0.1949	151.4	0.2776	0.1912	151.1	0.2768	0.1875	150.7	0.2759	0.1840	150.4	0.2750	145
150	0.1995	153.2	0.2805	0.1958	152.9	0.2797	0.1922	152.5	0.2789	0.1886	152.2	0.2780	150
155	0.2040	154.9	0.2833	0.2003	154.6	0.2825	0.1966	154.3	0.2817	0.1931	154.0	0.2809	155
160	0.2083	156.6	0.2861	0.2046	156.3	0.2853	0.2010	156.0	0.2845	0.1974	155.7	0.2837	160
165	0.2125	158.2	0.2887	0.2088	157.9	0.2879	0.2051	157.7	0.2872	0.2016	157.4	0.2864	165
170	0.2166	159.8	0.2913	0.2129	159.6	0.2905	0.2092	159.3	0.2898	0.2056	159.0	0.2890	170
175	0.2206	161.4	0.2938	0.2168	161.2	0.2931	0.2132	160.9	0.2923	0.2096	160.6	0.2916	175
180	0.2245	163.0	0.2963	0.2207	162.8	0.2955	0.2170	162.5	0.2948	0.2134	162.2	0.2941	180
185	0.2283	164.5	0.2987	0.2245	164.3	0.2980	0.2208	164.1	0.2973	0.2172	163.8	0.2966	185
190	0.2320	166.1	0.3010	0.2282	165.8	0.3003	0.2245	165.6	0.2997	0.2209	165.4	0.2990	190
195	0.2357	167.6	0.3034	0.2319	167.4	0.3027	0.2281	167.1	0.3020	0.2245	166.9	0.3013	195
200	0.2393	169.1	0.3056	0.2355	168.9	0.3050	0.2317	168.7	0.3043	0.2281	168.4	0.3037	200
205	0.2429	170.6	0.3079	0.2390	170.4	0.3072	0.2352	170.2	0.3066	0.2315	170.0	0.3059	205
210	0.2464	172.1	0.3101	0.2425	171.9	0.3095	0.2387	171.7	0.3088	0.2350	171.5	0.3082	210
215	0.2498	173.5	0.3123	0.2459	173.3	0.3117	0.2421	173.1	0.3110	0.2384	172.9	0.3104	215
220	0.2532	175.0	0.3145	0.2493	174.8	0.3138	0.2454	174.6	0.3132	0.2417	174.4	0.3126	220
225	0.2566	176.5	0.3166	0.2526	176.3	0.3160	0.2488	176.1	0.3154	0.2450	175.9	0.3148	225
230	0.2599	177.9	0.3187	0.2559	177.7	0.3181	0.2520	177.5	0.3175	0.2482	177.4	0.3169	230
235	0.2632	179.3	0.3208	0.2592	179.2	0.3202	0.2553	179.0	0.3196	0.2514	178.8	0.3190	235
240	0.2664	180.8	0.3228	0.2624	180.6	0.3222	0.2584	180.4	0.3217	0.2546	180.3	0.3211	240
245	0.2696	182.2	0.3249	0.2656	182.0	0.3243	0.2616	181.9	0.3237	0.2578	181.7	0.3231	245
250	0.2728	183.6	0.3269	0.2687	183.5	0.3263	0.2647	183.3	0.3257	0.2609	183.2	0.3252	250
255	0.2759	185.1	0.3289	0.2718	184.9	0.3283	0.2678	184.8	0.3278	0.2639	184.6	0.3272	255
260	0.2791	186.5	0.3309	0.2749	186.3	0.3303	0.2709	186.2	0.3297	0.2670	186.0	0.3292	260
265	0.2822	187.9	0.3329	0.2780	187.8	0.3323	0.2739	187.6	0.3317	0.2700	187.5	0.3312	265

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	420			440			460			480			Temp °F
	123.98 °F			127.63 °F			131.15 °F			134.55 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1470	139.6	0.256	0.1381	139.1	0.254	0.1299	138.7	0.252	0.1223	138.1	0.251	
125	0.1483	140.1	0.257										125
130	0.1545	142.5	0.261	0.1412	140.4	0.256							130
135	0.1602	144.8	0.265	0.1473	142.9	0.260	0.1349	140.8	0.256	0.1230	138.4	0.251	135
140	0.1655	146.9	0.268	0.1528	145.2	0.264	0.1408	143.3	0.260	0.1294	141.2	0.256	140
145	0.1704	148.9	0.271	0.1579	147.3	0.268	0.1461	145.6	0.264	0.1350	143.8	0.260	145
150	0.1751	150.8	0.275	0.1627	149.3	0.271	0.1511	147.8	0.268	0.1402	146.1	0.264	150
155	0.1796	152.7	0.278	0.1672	151.3	0.274	0.1558	149.8	0.271	0.1450	148.3	0.268	155
160	0.1840	154.4	0.281	0.1716	153.2	0.277	0.1602	151.8	0.274	0.1495	150.4	0.271	160
165	0.1881	156.2	0.283	0.1758	155.0	0.280	0.1644	153.7	0.277	0.1538	152.4	0.274	165
170	0.1922	157.9	0.286	0.1798	156.7	0.283	0.1684	155.5	0.280	0.1579	154.3	0.277	170
175	0.1961	159.6	0.289	0.1837	158.5	0.286	0.1723	157.3	0.283	0.1618	156.1	0.280	175
180	0.1999	161.2	0.291	0.1875	160.2	0.289	0.1761	159.1	0.286	0.1656	157.9	0.283	180
185	0.2036	162.8	0.294	0.1912	161.8	0.291	0.1797	160.8	0.288	0.1692	159.7	0.286	185
190	0.2072	164.4	0.296	0.1948	163.5	0.294	0.1833	162.5	0.291	0.1728	161.4	0.288	190
195	0.2108	166.0	0.299	0.1983	165.1	0.296	0.1868	164.1	0.294	0.1762	163.1	0.291	195
200	0.2143	167.6	0.301	0.2017	166.7	0.299	0.1902	165.7	0.296	0.1795	164.8	0.294	200
205	0.2177	169.1	0.303	0.2050	168.2	0.301	0.1935	167.3	0.298	0.1828	166.4	0.296	205
210	0.2210	170.6	0.306	0.2083	169.8	0.303	0.1967	168.9	0.301	0.1860	168.1	0.298	210
215	0.2244	172.1	0.308	0.2116	171.3	0.306	0.1999	170.5	0.303	0.1892	169.7	0.301	215
220	0.2276	173.6	0.310	0.2148	172.9	0.308	0.2030	172.1	0.305	0.1922	171.2	0.303	220
225	0.2308	175.1	0.312	0.2179	174.4	0.310	0.2061	173.6	0.308	0.1953	172.8	0.306	225
230	0.2340	176.6	0.315	0.2210	175.9	0.312	0.2091	175.1	0.310	0.1982	174.4	0.308	230
235	0.2371	178.1	0.317	0.2240	177.4	0.314	0.2121	176.6	0.312	0.2011	175.9	0.310	235
240	0.2402	179.6	0.319	0.2271	178.9	0.317	0.2150	178.2	0.314	0.2040	177.4	0.312	240
245	0.2432	181.0	0.321	0.2300	180.4	0.319	0.2179	179.7	0.316	0.2069	179.0	0.314	245
250	0.2463	182.5	0.323	0.2330	181.8	0.321	0.2208	181.2	0.319	0.2097	180.5	0.317	250
255	0.2492	183.9	0.325	0.2359	183.3	0.323	0.2236	182.6	0.321	0.2124	182.0	0.319	255
260	0.2522	185.4	0.327	0.2387	184.8	0.325	0.2264	184.1	0.323	0.2152	183.5	0.321	260
265	0.2551	186.8	0.329	0.2416	186.2	0.327	0.2292	185.6	0.325	0.2179	185.0	0.323	265
270	0.2580	188.3	0.331	0.2444	187.7	0.329	0.2319	187.1	0.327	0.2205	186.5	0.325	270

ABSOLUTE PRESSURE, psia													
Temp °F	500			520			540			560			Temp °F
	137.83 °F			141.02 °F			144.10 °F			147.09 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1153	137.5	0.2491	0.1087	136.9	0.2473	0.1024	136.2	0.2455	0.0966	135.4	0.2435	
140	0.1183	138.9	0.2514										140
145	0.1244	141.8	0.2561	0.1141	139.5	0.2516	0.1038	136.8	0.2466				145
150	0.1299	144.3	0.2603	0.1201	142.3	0.2563	0.1105	140.1	0.2520	0.1009	137.6	0.2472	150
155	0.1349	146.7	0.2642	0.1254	144.9	0.2605	0.1162	143.0	0.2567	0.1072	140.9	0.2525	155
160	0.1396	148.9	0.2677	0.1302	147.3	0.2644	0.1213	145.6	0.2608	0.1127	143.7	0.2571	160
165	0.1439	151.0	0.2711	0.1347	149.5	0.2679	0.1259	147.9	0.2647	0.1176	146.3	0.2613	165
170	0.1481	153.0	0.2743	0.1389	151.6	0.2713	0.1303	150.2	0.2682	0.1221	148.7	0.2651	170
175	0.1520	154.9	0.2774	0.1429	153.6	0.2745	0.1343	152.3	0.2716	0.1263	150.9	0.2686	175
180	0.1558	156.8	0.2803	0.1467	155.6	0.2775	0.1382	154.3	0.2748	0.1302	153.0	0.2719	180
185	0.1595	158.6	0.2831	0.1504	157.5	0.2805	0.1419	156.3	0.2778	0.1340	155.1	0.2751	185
190	0.1630	160.4	0.2859	0.1539	159.3	0.2833	0.1455	158.2	0.2807	0.1375	157.0	0.2782	190
195	0.1664	162.1	0.2885	0.1573	161.1	0.2861	0.1489	160.0	0.2836	0.1410	158.9	0.2811	195
200	0.1697	163.8	0.2911	0.1606	162.8	0.2887	0.1522	161.8	0.2863	0.1443	160.8	0.2839	200
205	0.1730	165.5	0.2937	0.1639	164.6	0.2913	0.1554	163.6	0.2890	0.1475	162.6	0.2866	205
210	0.1761	167.2	0.2962	0.1670	166.3	0.2939	0.1585	165.3	0.2916	0.1506	164.4	0.2893	210
215	0.1792	168.8	0.2986	0.1701	167.9	0.2963	0.1615	167.0	0.2941	0.1536	166.1	0.2919	215
220	0.1823	170.4	0.3010	0.1731	169.6	0.2988	0.1645	168.7	0.2966	0.1565	167.8	0.2944	220
225	0.1853	172.0	0.3033	0.1760	171.2	0.3011	0.1674	170.4	0.2990	0.1594	169.5	0.2969	225
230	0.1882	173.6	0.3056	0.1789	172.8	0.3035	0.1702	172.0	0.3014	0.1622	171.2	0.2993	230
235	0.1910	175.2	0.3079	0.1817	174.4	0.3058	0.1730	173.6	0.3037	0.1650	172.8	0.3017	235
240	0.1939	176.7	0.3101	0.1845	176.0	0.3080	0.1758	175.2	0.3060	0.1677	174.5	0.3040	240
245	0.1967	178.2	0.3123	0.1872	177.5	0.3103	0.1785	176.8	0.3083	0.1703	176.1	0.3063	245
250	0.1994	179.8	0.3145	0.1899	179.1	0.3125	0.1811	178.4	0.3105	0.1729	177.7	0.3086	250
255	0.2021	181.3	0.3166	0.1926	180.6	0.3146	0.1837	179.9	0.3127	0.1755	179.2	0.3108	255
260	0.2048	182.8	0.3187	0.1952	182.2	0.3168	0.1863	181.5	0.3149	0.1780	180.8	0.3130	260
265	0.2074	184.3	0.3208	0.1978	183.7	0.3189	0.1888	183.0	0.3170	0.1805	182.4	0.3152	265
270	0.2100	185.8	0.3229	0.2003	185.2	0.3210	0.1913	184.6	0.3191	0.1830	183.9	0.3173	270
275	0.2126	187.3	0.3249	0.2028	186.7	0.3230	0.1938	186.1	0.3212	0.1854	185.5	0.3194	275
280	0.2152	188.8	0.3270	0.2053	188.2	0.3251	0.1962	187.6	0.3233	0.1878	187.0	0.3215	280
285	0.2177	190.3	0.3290	0.2078	189.7	0.3271	0.1986	189.1	0.3253	0.1901	188.6	0.3236	285

Opteon™ XL41 (R-454B)
Superheated Vapor - Constant Pressure Tables

V = Volume in ft³/lb

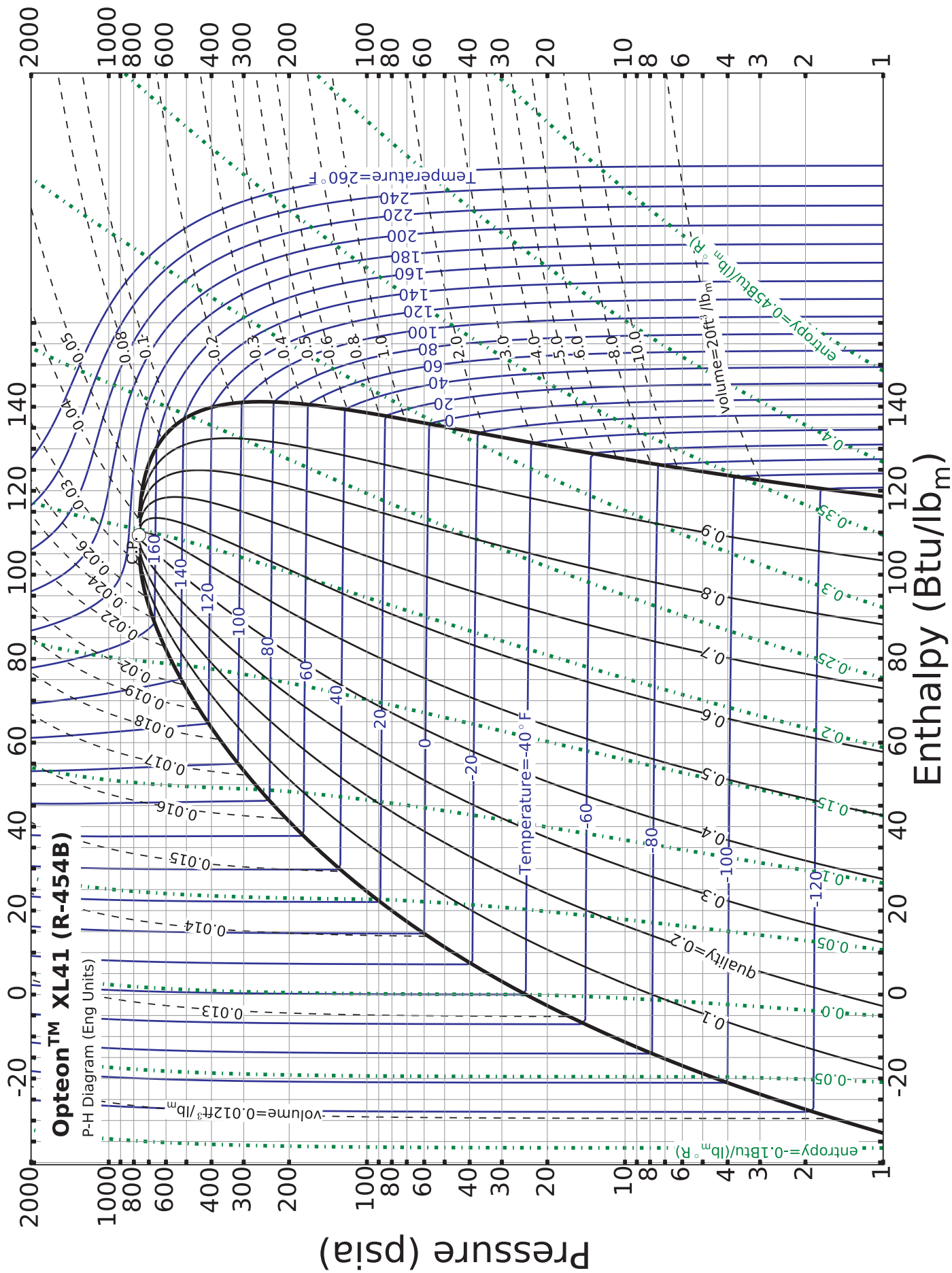
H = Enthalpy in BTU/lb

S = Entropy in BTU/lb·°R

Saturation Properties in Light Green

ABSOLUTE PRESSURE, psia													
Temp °F	580			600			620			640			Temp °F
	149.99 °F			152.80 °F			155.53 °F			158.19 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0910	134.5	0.242	0.0857	133.6	0.239	0.0806	132.5	0.237	0.0756	131.3	0.235	
150	0.0910	134.5	0.242										150
155	0.0984	138.5	0.248	0.0893	135.6	0.243							155
160	0.1044	141.7	0.253	0.0962	139.4	0.249	0.0879	136.7	0.244	0.0791	133.4	0.238	160
165	0.1096	144.5	0.258	0.1019	142.5	0.254	0.0943	140.3	0.250	0.0866	137.9	0.245	165
170	0.1143	147.0	0.262	0.1068	145.3	0.258	0.0996	143.4	0.255	0.0925	141.4	0.251	170
175	0.1186	149.4	0.266	0.1113	147.9	0.262	0.1043	146.2	0.259	0.0976	144.4	0.256	175
180	0.1227	151.7	0.269	0.1155	150.2	0.266	0.1087	148.7	0.263	0.1021	147.1	0.260	180
185	0.1265	153.8	0.272	0.1194	152.5	0.270	0.1127	151.1	0.267	0.1062	149.6	0.264	185
190	0.1301	155.8	0.276	0.1230	154.6	0.273	0.1164	153.3	0.270	0.1101	152.0	0.268	190
195	0.1335	157.8	0.279	0.1265	156.6	0.276	0.1199	155.4	0.274	0.1137	154.2	0.271	195
200	0.1368	159.7	0.281	0.1299	158.6	0.279	0.1233	157.5	0.277	0.1171	156.3	0.274	200
205	0.1401	161.6	0.284	0.1331	160.5	0.282	0.1265	159.5	0.280	0.1203	158.4	0.277	205
210	0.1431	163.4	0.287	0.1362	162.4	0.285	0.1296	161.4	0.283	0.1235	160.3	0.280	210
215	0.1462	165.2	0.290	0.1392	164.2	0.287	0.1326	163.3	0.285	0.1265	162.3	0.283	215
220	0.1491	166.9	0.292	0.1421	166.0	0.290	0.1355	165.1	0.288	0.1294	164.1	0.286	220
225	0.1519	168.7	0.295	0.1449	167.8	0.293	0.1384	166.9	0.291	0.1322	166.0	0.289	225
230	0.1547	170.4	0.297	0.1477	169.5	0.295	0.1411	168.7	0.293	0.1349	167.8	0.291	230
235	0.1574	172.0	0.300	0.1504	171.2	0.298	0.1438	170.4	0.296	0.1376	169.6	0.294	235
240	0.1601	173.7	0.302	0.1530	172.9	0.300	0.1464	172.1	0.298	0.1402	171.3	0.296	240
245	0.1627	175.3	0.304	0.1556	174.6	0.302	0.1490	173.8	0.301	0.1427	173.0	0.299	245
250	0.1653	176.9	0.307	0.1582	176.2	0.305	0.1515	175.5	0.303	0.1452	174.7	0.301	250
255	0.1678	178.5	0.309	0.1607	177.8	0.307	0.1539	177.1	0.305	0.1476	176.4	0.303	255
260	0.1703	180.1	0.311	0.1631	179.5	0.309	0.1564	178.8	0.308	0.1500	178.1	0.306	260
265	0.1728	181.7	0.313	0.1655	181.1	0.312	0.1587	180.4	0.310	0.1524	179.7	0.308	265
270	0.1752	183.3	0.316	0.1679	182.6	0.314	0.1611	182.0	0.312	0.1547	181.3	0.310	270
275	0.1776	184.9	0.318	0.1702	184.2	0.316	0.1634	183.6	0.314	0.1570	182.9	0.313	275
280	0.1799	186.4	0.320	0.1725	185.8	0.318	0.1657	185.2	0.316	0.1592	184.6	0.315	280
285	0.1822	188.0	0.322	0.1748	187.4	0.320	0.1679	186.8	0.318	0.1614	186.1	0.317	285
290	0.1845	189.5	0.324	0.1771	188.9	0.322	0.1701	188.3	0.321	0.1636	187.7	0.319	290
295	0.1868	191.0	0.326	0.1793	190.5	0.324	0.1723	189.9	0.323	0.1657	189.3	0.321	295

ABSOLUTE PRESSURE, psia													
Temp °F	660			680			700			720			Temp °F
	160.76 °F			163.26 °F			165.67 °F			168.00 °F			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0707	129.9	0.2321	0.0659	128.3	0.2292	0.0610	126.4	0.2258	0.0558	124.0	0.2216	
165	0.0788	134.9	0.2401	0.0701	131.0	0.2335							165
170	0.0855	139.0	0.2467	0.0784	136.4	0.2420	0.0708	133.1	0.2364	0.0622	128.6	0.2289	170
175	0.0910	142.4	0.2521	0.0845	140.3	0.2482	0.0780	137.8	0.2438	0.0713	135.0	0.2389	175
180	0.0958	145.4	0.2567	0.0896	143.5	0.2533	0.0836	141.5	0.2496	0.0776	139.3	0.2457	180
185	0.1001	148.1	0.2609	0.0942	146.4	0.2578	0.0884	144.7	0.2546	0.0828	142.8	0.2511	185
190	0.1040	150.5	0.2648	0.0983	149.1	0.2619	0.0927	147.5	0.2589	0.0873	145.8	0.2559	190
195	0.1077	152.9	0.2683	0.1020	151.5	0.2657	0.0966	150.1	0.2629	0.0914	148.6	0.2601	195
200	0.1112	155.1	0.2717	0.1056	153.8	0.2692	0.1002	152.5	0.2666	0.0951	151.2	0.2640	200
205	0.1145	157.2	0.2749	0.1089	156.0	0.2725	0.1036	154.8	0.2701	0.0985	153.6	0.2676	205
210	0.1176	159.3	0.2780	0.1121	158.2	0.2757	0.1068	157.0	0.2734	0.1018	155.8	0.2711	210
215	0.1206	161.3	0.2809	0.1151	160.2	0.2787	0.1099	159.1	0.2765	0.1049	158.0	0.2743	215
220	0.1235	163.2	0.2838	0.1180	162.2	0.2817	0.1128	161.2	0.2795	0.1078	160.1	0.2774	220
225	0.1264	165.1	0.2865	0.1208	164.1	0.2845	0.1156	163.2	0.2824	0.1107	162.2	0.2804	225
230	0.1291	166.9	0.2892	0.1236	166.0	0.2872	0.1183	165.1	0.2852	0.1134	164.1	0.2833	230
235	0.1317	168.7	0.2918	0.1262	167.8	0.2899	0.1210	167.0	0.2880	0.1160	166.1	0.2860	235
240	0.1343	170.5	0.2944	0.1288	169.7	0.2925	0.1235	168.8	0.2906	0.1186	168.0	0.2888	240
245	0.1368	172.2	0.2969	0.1313	171.4	0.2950	0.1260	170.6	0.2932	0.1211	169.8	0.2914	245
250	0.1393	174.0	0.2993	0.1337	173.2	0.2975	0.1285	172.4	0.2957	0.1235	171.6	0.2939	250
255	0.1417	175.7	0.3017	0.1361	174.9	0.2999	0.1308	174.2	0.2982	0.1258	173.4	0.2965	255
260	0.1441	177.3	0.3040	0.1385	176.6	0.3023	0.1332	175.9	0.3006	0.1281	175.2	0.2989	260
265	0.1464	179.0	0.3063	0.1408	178.3	0.3047	0.1354	177.6	0.3030	0.1304	176.9	0.3013	265
270	0.1487	180.7	0.3086	0.1430	180.0	0.3070	0.1377	179.3	0.3053	0.1326	178.6	0.3037	270
275	0.1509	182.3	0.3109	0.1452	181.6	0.3092	0.1399	181.0	0.3076	0.1348	180.3	0.3060	275
280	0.1531	183.9	0.3131	0.1474	183.3	0.3114	0.1420	182.6	0.3099	0.1369	182.0	0.3083	280
285	0.1553	185.5	0.3152	0.1496	184.9	0.3136	0.1441	184.3	0.3121	0.1390	183.7	0.3105	285
290	0.1575	187.1	0.3174	0.1517	186.5	0.3158	0.1462	185.9	0.3143	0.1411	185.3	0.3127	290
295	0.1596	188.7	0.3195	0.1538	188.1	0.3179	0.1483	187.6	0.3164	0.1431	187.0	0.3149	295
300	0.1617	190.3	0.3216	0.1558	189.7	0.3201	0.1503	189.2	0.3186	0.1451	188.6	0.3171	300
305	0.1637	191.9	0.3237	0.1578	191.3	0.3221	0.1523	190.8	0.3207	0.1471	190.2	0.3192	305
310	0.1658	193.5	0.3257	0.1599	192.9	0.3242	0.1543	192.4	0.3227	0.1490	191.8	0.3213	310



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