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Fig. 12 Pressure-Enthalpy Diagram for Refrigerant 134a

Refrigerant 134a (1,1,1,2-Tetrafluoroethane) Properties of Saturated Liquid and Saturated Vapor

Temp,* °F	Pressure, psia	Density, lb/ft ³		Volume, ft ³ /lb		Enthalpy, Btu/lb		Entropy, Btu/lb·°F		Specific Heat <i>c_p</i> , Btu/lb·°F			Velocity of Sound, ft/s		Viscosity, lb _m /ft·h		Thermal Cond, Btu/h·ft·°F		Surface Tension, dyne/cm	Temp,* °F
		Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor		
-153.94a	0.057	99.34	564.85	32.989	80.235	0.09154	0.27880	0.2740	0.1397	1.1628	3723.	416.	5.289	0.0160	—	—	28.15	-153.94		
-150.00	0.072	98.95	449.29	31.902	80.783	0.08801	0.27588	0.2776	0.1409	1.1615	3670.	418.	4.913	0.0163	—	—	27.76	-150.00		
-140.00	0.130	97.98	259.15	29.093	82.190	0.07908	0.26903	0.2837	0.1438	1.1583	3552.	424.	4.117	0.0168	—	—	26.78	-140.00		
-130.00	0.222	97.01	155.69	26.238	83.618	0.07029	0.26294	0.2870	0.1467	1.1554	3448.	430.	3.497	0.0173	—	—	25.81	-130.00		
-120.00	0.367	96.05	97.027	23.359	85.066	0.06169	0.25752	0.2886	0.1497	1.1528	3352.	436.	3.006	0.0179	—	—	24.86	-120.00		
-110.00	0.586	95.09	62.509	20.467	86.531	0.05330	0.25270	0.2895	0.1527	1.1507	3261.	441.	2.613	0.0184	—	—	23.92	-110.00		
-100.00	0.906	94.13	41.496	17.569	88.011	0.04513	0.24842	0.2900	0.1559	1.1489	3173.	446.	2.292	0.0190	—	—	22.99	-100.00		
-90.00	1.363	93.17	28.303	14.665	89.504	0.03717	0.24462	0.2906	0.1591	1.1475	3087.	451.	2.028	0.0195	0.0721	—	22.08	-90.00		
-80.00	1.997	92.21	19.783	11.755	91.005	0.02940	0.24125	0.2913	0.1624	1.1463	3001.	456.	1.808	0.0200	0.0706	—	21.17	-80.00		
-75.00	2.396	91.73	16.680	10.297	91.759	0.02559	0.23972	0.2917	0.1641	1.1463	2959.	458.	1.712	0.0203	0.0699	—	20.73	-75.00		
-70.00	2.859	91.25	14.138	8.837	92.514	0.02182	0.23827	0.2922	0.1658	1.1462	2916.	460.	1.623	0.0206	0.0691	—	20.28	-70.00		
-65.00	3.393	90.77	12.045	7.374	93.270	0.01809	0.23691	0.2928	0.1676	1.1461	2874.	462.	1.542	0.0209	0.0684	—	19.84	-65.00		
-60.00	4.006	90.28	10.310	5.907	94.026	0.01440	0.23563	0.2935	0.1694	1.1462	2832.	464.	1.466	0.0212	0.0677	0.00405	19.40	-60.00		
-55.00	4.707	89.80	8.8656	4.437	94.783	0.01075	0.23443	0.2943	0.1712	1.1465	2790.	466.	1.396	0.0214	0.0669	0.00423	18.96	-55.00		
-50.00	5.505	89.31	7.6569	2.963	95.539	0.00713	0.23331	0.2951	0.1731	1.1468	2747.	468.	1.331	0.0217	0.0662	0.00440	18.52	-50.00		
-45.00	6.409	88.82	6.6405	1.484	96.295	0.00355	0.23225	0.2960	0.1750	1.1473	2705.	470.	1.271	0.0220	0.0654	0.00457	18.09	-45.00		
-40.00	7.429	88.32	5.7819	0.000	97.050	0.00000	0.23125	0.2970	0.1769	1.1479	2663.	471.	1.215	0.0223	0.0647	0.00473	17.66	-40.00		
-35.00	8.577	87.83	5.0533	1.489	97.804	0.00352	0.23032	0.2981	0.1789	1.1487	2621.	473.	1.163	0.0225	0.0639	0.00489	17.23	-35.00		
-30.00	9.862	87.33	4.4325	2.984	98.556	0.00701	0.22945	0.2992	0.1810	1.1497	2579.	474.	1.113	0.0228	0.0632	0.00505	16.81	-30.00		
-25.00	11.297	86.82	3.9014	4.484	99.306	0.01048	0.22863	0.3004	0.1831	1.1508	2536.	476.	1.068	0.0231	0.0625	0.00521	16.38	-25.00		
-20.00	12.895	86.32	3.4452	5.991	100.054	0.01392	0.22786	0.3017	0.1852	1.1521	2494.	477.	1.024	0.0234	0.0617	0.00536	15.96	-20.00		
-15.00	14.667	85.81	3.0519	7.505	100.799	0.01733	0.22714	0.3031	0.1874	1.1535	2452.	478.	0.984	0.0237	0.0610	0.00550	15.54	-15.00		
-14.92b	14.696	85.80	3.0462	7.529	100.811	0.01739	0.22713	0.3031	0.1874	1.1535	2451.	478.	0.983	0.0237	0.0610	0.00551	15.54	-14.92		
-10.00	16.626	85.29	2.7116	9.026	101.542	0.02073	0.22647	0.3045	0.1897	1.1552	2410.	479.	0.946	0.0240	0.0602	0.00565	15.13	-10.00		
-5.00	18.787	84.77	2.4161	10.554	102.280	0.02409	0.22584	0.3060	0.1920	1.1570	2367.	480.	0.910	0.0243	0.0595	0.00579	14.71	-5.00		
0.00	21.162	84.25	2.1587	12.090	103.015	0.02744	0.22525	0.3075	0.1943	1.1590	2325.	481.	0.876	0.0245	0.0588	0.00593	14.30	0.00		
5.00	23.767	83.72	1.9337	13.634	103.745	0.03077	0.22470	0.3091	0.1968	1.1613	2283.	481.	0.843	0.0248	0.0580	0.00607	13.89	5.00		
10.00	26.617	83.18	1.7365	15.187	104.471	0.03408	0.22418	0.3108	0.1993	1.1637	2240.	482.	0.813	0.0251	0.0573	0.00621	13.48	10.00		
15.00	29.726	82.64	1.5630	16.748	105.192	0.03737	0.22370	0.3126	0.2018	1.1664	2198.	482.	0.784	0.0254	0.0565	0.00635	13.08	15.00		
20.00	33.110	82.10	1.4101	18.318	105.907	0.04065	0.22325	0.3144	0.2045	1.1694	2155.	482.	0.756	0.0257	0.0558	0.00649	12.67	20.00		
25.00	36.785	81.55	1.2749	19.897	106.617	0.04391	0.22283	0.3162	0.2072	1.1726	2113.	482.	0.730	0.0260	0.0550	0.00662	12.27	25.00		
30.00	40.768	80.99	1.1550	21.486	107.320	0.04715	0.22244	0.3182	0.2100	1.1761	2070.	482.	0.705	0.0263	0.0543	0.00676	11.87	30.00		
35.00	45.075	80.42	1.0484	23.085	108.016	0.05038	0.22207	0.3202	0.2129	1.1799	2027.	482.	0.681	0.0267	0.0536	0.00690	11.48	35.00		
40.00	49.724	79.85	0.9534	24.694	108.705	0.05359	0.22172	0.3223	0.2159	1.1841	1985.	482.	0.658	0.0270	0.0528	0.00704	11.08	40.00		
45.00	54.732	79.26	0.8685	26.314	109.386	0.05679	0.22140	0.3244	0.2190	1.1886	1942.	481.	0.636	0.0273	0.0521	0.00718	10.69	45.00		
50.00	60.116	78.67	0.7925	27.944	110.058	0.05998	0.22110	0.3267	0.2222	1.1935	1899.	481.	0.615	0.0276	0.0513	0.00732	10.30	50.00		
55.00	65.895	78.07	0.7243	29.586	110.722	0.06316	0.22081	0.3290	0.2255	1.1988	1856.	480.	0.595	0.0280	0.0506	0.00746	9.91	55.00		
60.00	72.087	77.46	0.6630	31.239	111.376	0.06633	0.22054	0.3314	0.2289	1.2046	1813.	479.	0.576	0.0283	0.0499	0.00761	9.53	60.00		
65.00	78.712	76.84	0.6077	32.905	112.019	0.06949	0.22028	0.3339	0.2325	1.2109	1770.	477.	0.557	0.0286	0.0491	0.00776	9.15	65.00		
70.00	85.787	76.21	0.5577	34.583	112.652	0.07264	0.22003	0.3366	0.2363	1.2178	1726.	476.	0.539	0.0290	0.0484	0.00791	8.77	70.00		
75.00	93.333	75.57	0.5125	36.274	113.272	0.07578	0.21979	0.3393	0.2402	1.2252	1683.	474.	0.522	0.0294	0.0476	0.00806	8.39	75.00		
80.00	101.37	74.91	0.4715	37.978	113.880	0.07892	0.21957	0.3422	0.2444	1.2334	1640.	472.	0.505	0.0297	0.0469	0.00822	8.02	80.00		
85.00	109.92	74.25	0.4343	39.697	114.475	0.08205	0.21934	0.3453	0.2487	1.2424	1596.	470.	0.489	0.0301	0.0462	0.00838	7.65	85.00		
90.00	119.00	73.57	0.4004	41.430	115.055	0.08518	0.21912	0.3485	0.2533	1.2522	1552.	468.	0.473	0.0305	0.0454	0.00855	7.28	90.00		
95.00	128.63	72.87	0.3694	43.179	115.619	0.08830	0.21890	0.3519	0.2582	1.2630	1509.	466.	0.458	0.0309	0.0447	0.00872	6.91	95.00		
100.00	138.83	72.16	0.3411	44.943	116.166	0.09142	0.21868	0.3555	0.2633	1.2748	1465.	463.	0.443	0.0313	0.0439	0.00890	6.55	100.00		
105.00	149.63	71.43	0.3153	46.725	116.694	0.09454	0.21845	0.3594	0.2689	1.2880	1421.	460.	0.428	0.0318	0.0432	0.00908	6.20	105.00		
110.00	161.05	70.68	0.2915	48.524	117.203	0.09766	0.21822	0.3635	0.2748	1.3026	1376.	457.	0.414	0.0322	0.0425	0.00926	5.84	110.00		
115.00	173.11	69.91	0.2697	50.343	117.690	0.10078	0.21797	0.3680	0.2812	1.3189	1332.	454.	0.400	0.0327	0.0417	0.00946	5.49	115.00		
120.00	185.84	69.12	0.2497	52.181	118.153	0.10391	0.21772	0.3728	0.2881	1.3372	1288.	450.	0.387	0.0332	0.0410	0.00965	5.15	120.00		
125.00	199.25	68.31	0.2312	54.040	118.591	0.10704	0.21744	0.3781	0.2957	1.3577	1243.	446.	0.374	0.0338	0.0403	0.00986	4.80	125.00		
130.00	213.38	67.47	0.2141	55.923	119.000	0.11018	0.21715	0.3839	0.3040	1.3810	1198.	442.	0.361	0.0343	0.0395	0.01007	4.47	130.00		
135.00	228.25	66.60	0.1983	57.830	119.377	0.11333	0.21683	0.3903	0.3133	1.4075	1153.	437.	0.348	0.0349	0.0388	0.01029	4.13	135.00		
140.00	243.88	65.70	0.1836	59.764	119.720	0.11650	0.21648	0.3974	0.3236	1.4379	1108.	432.	0.335	0.0356	0.0380	0.01052	3.81	140.00		
145.00	260.31	64.77	0.1700	61.727	120.024	0.11968	0.21609	0.4053	0.3353	1.4731	1062.	427.	0.323	0.0363	0.0373	0.01075	3.48	145.00		
150.00	277.57	63.80	0.1574	63.722	120.284	0.12288	0.21566	0.4144	0.3486	1.5143	1017.	421.	0.311	0.0370	0.0366	0.01100	3.17	150.00		
155.00	295.69	62.78	0.1455	65.752	120.495	0.12611	0.21517	0.4247	0.3640	1.5630	971.	416.	0.298	0.0378	0.0358	0.01125	2.86	155.00		
160.00	314.69	61.72	0.1345	67.823	120.650	0.12938	0.21463	0.436												

Refrigerant 134a Properties of Superheated Vapor

Pressure = 14.696 psia Saturation temperature = -14.92 °F					Pressure = 25.00 psia Saturation temperature = 7.22 °F					Pressure = 50.00 psia Saturation temperature = 40.29 °F				
Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s
Saturated					Saturated					Saturated				
Liquid	85.7972	7.53	0.01739	2451.2	Liquid	83.4823	14.32	0.03224	2263.9	Liquid	79.8125	24.79	0.05377	1982.3
Vapor	0.3283	100.81	0.22713	478.0	Vapor	0.5426	104.07	0.22446	481.5	Vapor	1.0545	108.74	0.22170	481.7
0.00	0.3158	103.62	0.23335	487.2										
20.00	0.3008	107.45	0.24149	499.0	20.00	0.5245	106.60	0.22982	489.9					
40.00	0.2874	111.34	0.24944	510.2	40.00	0.4991	110.61	0.23800	502.4					
60.00	0.2753	115.31	0.25723	521.0	60.00	0.4765	114.66	0.24596	514.1	60.00	0.9982	113.00	0.23005	496.2
80.00	0.2642	119.35	0.26486	531.5	80.00	0.4563	118.78	0.25373	525.4	80.00	0.9489	117.32	0.23822	509.8
100.00	0.2541	123.47	0.27236	541.6	100.00	0.4379	122.96	0.26135	536.2	100.00	0.9055	121.68	0.24614	522.5
120.00	0.2448	127.68	0.27974	551.4	120.00	0.4212	127.22	0.26881	546.6	120.00	0.8670	126.07	0.25385	534.5
140.00	0.2362	131.96	0.28700	561.0	140.00	0.4058	131.55	0.27615	556.7	140.00	0.8322	130.51	0.26139	545.8
160.00	0.2282	136.32	0.29416	570.4	160.00	0.3916	135.95	0.28337	566.5	160.00	0.8008	135.01	0.26877	556.7
180.00	0.2208	140.77	0.30122	579.5	180.00	0.3786	140.43	0.29048	576.0	180.00	0.7718	139.57	0.27601	567.2
200.00	0.2139	145.30	0.30819	588.5	200.00	0.3663	144.98	0.29750	585.3	200.00	0.7454	144.20	0.28313	577.4
220.00	0.2074	149.90	0.31507	597.3	220.00	0.3549	149.61	0.30441	594.4	220.00	0.7208	148.89	0.29014	587.2
240.00	0.2013	154.59	0.32187	606.0	240.00	0.3443	154.32	0.31124	603.3	240.00	0.6980	153.65	0.29704	596.8
260.00	0.1955	159.36	0.32858	614.5	260.00	0.3343	159.10	0.31798	612.0	260.00	0.6768	158.48	0.30385	606.1
280.00	0.1901	164.20	0.33522	622.8	280.00	0.3248	163.96	0.32464	620.6	280.00	0.6569	163.38	0.31056	615.2
300.00	0.1850	169.12	0.34178	631.1	300.00	0.3160	168.90	0.33122	629.0	300.00	0.6383	168.35	0.31719	624.1
Pressure = 75.00 psia Saturation temperature = 62.24 °F					Pressure = 100.00 psia Saturation temperature = 79.17 °F					Pressure = 125.00 psia Saturation temperature = 93.15 °F				
Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s
Saturated					Saturated					Saturated				
Liquid	77.1862	31.98	0.06775	1793.6	Liquid	75.0245	37.69	0.07840	1646.8	Liquid	73.1279	42.53	0.08715	1524.7
Vapor	1.5686	111.67	0.22042	478.1	Vapor	2.0917	113.78	0.21960	472.8	Vapor	2.6279	115.41	0.21898	466.7
80.00	1.4873	115.74	0.22809	492.7	80.00	2.0858	113.98	0.21998	473.6					
100.00	1.4092	120.30	0.23639	507.7	100.00	1.9576	118.80	0.22874	491.6	100.00	2.5638	117.16	0.22212	473.9
120.00	1.3416	124.85	0.24439	521.6	120.00	1.8509	123.55	0.23709	507.8	120.00	2.4025	122.16	0.23090	492.9
140.00	1.2822	129.43	0.25215	534.5	140.00	1.7597	128.29	0.24512	522.4	140.00	2.2694	127.08	0.23924	509.7
160.00	1.2294	134.04	0.25971	546.6	160.00	1.6800	133.02	0.25288	536.0	160.00	2.1561	131.96	0.24725	525.0
180.00	1.1817	138.69	0.26710	558.2	180.00	1.6094	137.78	0.26044	548.8	180.00	2.0577	136.83	0.25498	539.0
200.00	1.1383	143.39	0.27434	569.2	200.00	1.5463	142.57	0.26781	560.8	200.00	1.9710	141.71	0.26250	552.2
220.00	1.0984	148.15	0.28145	579.8	220.00	1.4891	147.40	0.27502	572.3	220.00	1.8935	146.62	0.26983	564.6
240.00	1.0620	152.97	0.28843	590.1	240.00	1.4368	152.27	0.28210	583.3	240.00	1.8233	151.56	0.27700	576.4
260.00	1.0280	157.85	0.29531	600.0	260.00	1.3886	157.21	0.28905	593.9	260.00	1.7592	156.55	0.28402	587.6
280.00	0.9966	162.79	0.30208	609.7	280.00	1.3444	162.19	0.29588	604.1	280.00	1.7006	161.59	0.29093	598.4
300.00	0.9671	167.80	0.30876	619.0	300.00	1.3031	167.24	0.30261	614.0	300.00	1.6463	166.67	0.29771	608.8
320.00	0.9398	172.87	0.31535	628.2	320.00	1.2647	172.35	0.30925	623.6	320.00	1.5959	171.82	0.30440	618.9
340.00	0.9138	178.01	0.32186	637.1	340.00	1.2287	177.52	0.31579	632.9	340.00	1.5492	177.02	0.31098	628.7
360.00	0.8895	183.21	0.32828	645.9	360.00	1.1950	182.75	0.32225	642.1	360.00	1.5055	182.27	0.31747	638.2
380.00	0.8665	188.48	0.33463	654.5	380.00	1.1633	188.04	0.32863	651.0	380.00	1.4644	187.59	0.32388	647.5
400.00	0.8448	193.82	0.34091	662.9	400.00	1.1334	193.39	0.33494	659.8	400.00	1.4258	192.97	0.33021	656.6
Pressure = 150.00 psia Saturation temperature = 105.17 °F					Pressure = 175.00 psia Saturation temperature = 115.76 °F					Pressure = 200.00 psia Saturation temperature = 125.27 °F				
Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s
Saturated					Saturated					Saturated				
Liquid	71.4013	46.78	0.09464	1419.1	Liquid	69.7902	50.62	0.10126	1325.3	Liquid	68.2602	54.14	0.10721	1240.5
Vapor	3.1801	116.71	0.21844	460.0	Vapor	3.7511	117.76	0.21794	453.0	Vapor	4.3437	118.61	0.21743	445.6
120.00	3.0077	120.64	0.22530	476.6	120.00	3.6836	118.95	0.21999	458.4					
140.00	2.8181	125.78	0.23403	496.0	140.00	3.4148	124.38	0.22921	481.3	140.00	4.0726	122.86	0.22460	465.2
160.00	2.6620	130.83	0.24231	513.3	160.00	3.2025	129.64	0.23783	500.9	160.00	3.7850	128.36	0.23363	487.8
180.00	2.5295	135.83	0.25026	528.9	180.00	3.0271	134.79	0.24602	518.3	180.00	3.5561	133.70	0.24210	507.2
200.00	2.4146	140.82	0.25794	543.3	200.00	2.8785	139.90	0.25388	534.0	200.00	3.3656	138.94	0.25018	524.5
220.00	2.3132	145.82	0.26539	556.7	220.00	2.7494	144.99	0.26148	548.5	220.00	3.2036	144.14	0.25793	540.2
240.00	2.2223	150.83	0.27267	569.3	240.00	2.6349	150.08	0.26887	562.1	240.00	3.0623	149.31	0.26544	554.7
260.00	2.1401	155.88	0.27978	581.3	260.00	2.5328	155.19	0.27607	574.8	260.00	2.9371	154.50	0.27274	568.3
280.00	2.0658	160.97	0.28675	592.7	280.00	2.4403	160.34	0.28312	586.9	280.00	2.8247	159.69	0.27987	581.1
300.00	1.9971	166.10	0.29360	603.7	300.00	2.3558	165.51	0.29003	598.5	300.00	2.7234	164.92	0.28684	593.2
320.00	1.9338	171.28	0.30033	614.2	320.00	2.2785	170.73	0.29681	609.5	320.00	2.6305	170.18	0.29368	604.8
340.00	1.8751	176.51	0.30696	624.5	340.00	2.2071	176.00	0.30348	620.2	340.00	2.5455	175.49	0.30039	615.9
360.00	1.8208	181.80	0.31349	634.4	360.00	2.1411	181.32	0.31004	630.5	360.00	2.4668	180.83	0.30700	626.7
380.00	1.7695	187.14	0.31993	644.0	380.00	2.0795	186.69	0.31651	640.5	380.00	2.3934	186.23	0.31350	637.0
400.00	1.7216	192.54	0.32628	653.4	400.00	2.0216	192.11	0.32290	650.3	400.00	2.3254	191.68	0.31991	647.1
420.00	1.6766	198.00	0.33256	662.6	420.00	1.9675	197.59	0.32920	659.7	420.00	2.2614	197.18	0.32624	656.9
440.00	1.6341	203.51	0.33876	671.6	440.00	1.9164	203.12	0.33542	669.0	440.00	2.2017	202.73	0.33248	666.4
460.00	1.5940	209.08	0.34488	680.4	460.00	1.8683	208.71	0.34156	678.0	460.00	2.1453	208.34	0.33864	675.7
480.00	1.5558	214.71	0.35094	689.0	480.00	1.8228	214.36	0.34763	686.9	480.00	2.0920	214.00	0.34473	684.8
500.00	1.5197	220.40	0.35692	697.4	500.00	1.7797	220.05	0.35363	695.6	500.00	2.0417	219.71	0.35075	693.7

*temperatures are on the ITS-90 scale

Refrigerant 134a Properties of Superheated Vapor (Concluded)

Pressure = 225.00 psia Saturation temperature = 133.93 °F					Pressure = 250.00 psia Saturation temperature = 141.89 °F					Pressure = 275.00 psia Saturation temperature = 149.27 °F				
Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s
Saturated					Saturated					Saturated				
Liquid	66.7870	57.42	0.11266	1162.8	Liquid	65.3526	60.50	0.11770	1090.7	Liquid	63.9423	63.43	0.12241	1023.4
Vapor	4.9609	119.30	0.21690	438.1	Vapor	5.6060	119.84	0.21634	430.3	Vapor	6.2831	120.25	0.21572	422.3
140.00	4.8123	121.16	0.22002	447.3										
160.00	4.4191	126.99	0.22959	473.6	160.00	5.1189	125.49	0.22560	458.2	160.00	5.9060	123.82	0.22155	441.2
180.00	4.1206	132.54	0.23840	495.5	180.00	4.7275	131.31	0.23484	483.1	180.00	5.3869	129.98	0.23133	469.9
200.00	3.8796	137.94	0.24671	514.6	200.00	4.4239	136.89	0.24343	504.2	200.00	5.0031	135.78	0.24026	493.4
220.00	3.6784	143.25	0.25465	531.6	220.00	4.1756	142.34	0.25156	522.8	220.00	4.6978	141.38	0.24862	513.7
240.00	3.5058	148.52	0.26229	547.2	240.00	3.9664	147.71	0.25935	539.5	240.00	4.4465	146.87	0.25658	531.7
260.00	3.3542	153.78	0.26970	561.6	260.00	3.7854	153.05	0.26688	554.9	260.00	4.2314	152.30	0.26423	548.0
280.00	3.2202	159.04	0.27691	575.1	280.00	3.6265	158.37	0.27418	569.2	280.00	4.0446	157.69	0.27162	563.1
300.00	3.0995	164.32	0.28395	587.9	300.00	3.4847	163.71	0.28129	582.6	300.00	3.8803	163.08	0.27881	577.2
320.00	2.9899	169.62	0.29084	600.0	320.00	3.3571	169.06	0.28824	595.3	320.00	3.7317	168.49	0.28583	590.5
340.00	2.8897	174.97	0.29761	611.7	340.00	3.2408	174.44	0.29506	607.4	340.00	3.5987	173.91	0.29270	603.1
360.00	2.7978	180.35	0.30425	622.8	360.00	3.1342	179.85	0.30175	618.9	360.00	3.4764	179.36	0.29943	615.1
380.00	2.7122	185.77	0.31079	633.6	380.00	3.0359	185.31	0.30832	630.1	380.00	3.3646	184.84	0.30604	626.6
400.00	2.6330	191.24	0.31723	644.0	400.00	2.9451	190.81	0.31479	640.8	400.00	3.2612	190.37	0.31254	637.7
420.00	2.5592	196.77	0.32358	654.0	420.00	2.8604	196.35	0.32117	651.2	420.00	3.1653	195.93	0.31894	648.4
440.00	2.4900	202.34	0.32984	663.9	440.00	2.7813	201.94	0.32745	661.3	440.00	3.0758	201.55	0.32525	658.8
460.00	2.4249	207.96	0.33603	673.4	460.00	2.7072	207.58	0.33365	671.1	460.00	2.9922	207.20	0.33147	668.9
480.00	2.3636	213.64	0.34213	682.8	480.00	2.6374	213.27	0.33977	680.7	480.00	2.9136	212.91	0.33761	678.7
500.00	2.3057	219.36	0.34816	691.9	500.00	2.5717	219.02	0.34582	690.1	500.00	2.8397	218.67	0.34368	688.3
Pressure = 300.00 psia Saturation temperature = 156.16 °F					Pressure = 325.00 psia Saturation temperature = 162.62 °F					Pressure = 350.00 psia Saturation temperature = 168.71 °F				
Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s
Saturated					Saturated					Saturated				
Liquid	62.5436	66.23	0.12686	959.8	Liquid	61.1446	68.92	0.13110	899.5	Liquid	59.7334	71.54	0.13516	841.7
Vapor	6.9967	120.54	0.21505	414.2	Vapor	7.7526	120.71	0.21431	405.9	Vapor	8.5577	120.76	0.21349	397.5
160.00	6.8168	121.92	0.21730	422.0										
180.00	6.1118	128.55	0.22782	455.8	180.00	6.9220	126.96	0.22423	440.3	180.00	7.8491	125.18	0.22046	423.2
200.00	5.6239	134.61	0.23715	482.1	200.00	6.2928	133.36	0.23408	470.2	200.00	7.0242	132.01	0.23098	457.6
220.00	5.2494	140.39	0.24578	504.3	220.00	5.8341	139.34	0.24301	494.5	220.00	6.4561	138.24	0.24029	484.4
240.00	4.9472	146.00	0.25393	523.7	240.00	5.4723	145.10	0.25136	515.5	240.00	6.0219	144.17	0.24888	507.1
260.00	4.6939	151.52	0.26171	541.1	260.00	5.1741	150.73	0.25930	534.0	260.00	5.6728	149.91	0.25698	526.9
280.00	4.4758	157.00	0.26921	557.0	280.00	4.9208	156.29	0.26692	550.9	280.00	5.3805	155.56	0.26472	544.7
300.00	4.2852	162.45	0.27649	571.8	300.00	4.7017	161.81	0.27428	566.4	300.00	5.1295	161.15	0.27218	561.0
320.00	4.1160	167.90	0.28357	585.7	320.00	4.5082	167.31	0.28144	580.9	320.00	4.9098	166.72	0.27941	576.1
340.00	3.9631	173.37	0.29049	598.8	340.00	4.3352	172.82	0.28841	594.5	340.00	4.7148	172.27	0.28644	590.2
360.00	3.8247	178.85	0.29727	611.2	360.00	4.1790	178.35	0.29524	607.4	360.00	4.5396	177.84	0.29332	603.6
380.00	3.6981	184.37	0.30392	623.1	380.00	4.0368	183.90	0.30193	619.7	380.00	4.3807	183.42	0.30005	616.3
400.00	3.5816	189.92	0.31045	634.6	400.00	3.9063	189.48	0.30849	631.5	400.00	4.2355	189.03	0.30665	628.4
420.00	3.4737	195.51	0.31688	645.6	420.00	3.7859	195.09	0.31495	642.8	420.00	4.1019	194.67	0.31313	640.1
440.00	3.3735	201.15	0.32321	656.3	440.00	3.6743	200.75	0.32131	653.8	440.00	3.9784	200.35	0.31952	651.4
460.00	3.2799	206.83	0.32945	666.6	460.00	3.5703	206.44	0.32757	664.4	460.00	3.8636	206.06	0.32580	662.2
480.00	3.1922	212.55	0.33561	676.7	480.00	3.4731	212.19	0.33375	674.7	480.00	3.7564	211.82	0.33199	672.8
500.00	3.1098	218.32	0.34169	686.5	500.00	3.3819	217.97	0.33984	684.7	500.00	3.6561	217.62	0.33811	683.0
Pressure = 375.00 psia Saturation temperature = 174.46 °F					Pressure = 400.00 psia Saturation temperature = 197.93 °F					Pressure = 600.00 psia Saturation temperature = n/a (supercritical)				
Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s	Temp,* °F	Density, lb/ft ³	Enthalpy, Btu/lb	Entropy, Btu/lb·°F	Vel. Sound, ft/s
Saturated					Saturated									
Liquid	58.2974	74.09	0.13908	785.9	Liquid	56.8213	76.60	0.14289	731.8					
Vapor	9.4209	120.69	0.21256	389.0	Vapor	10.3541	120.50	0.21152	380.4					
180.00	8.9498	123.10	0.21634	403.8	180.00	10.3454	120.53	0.21158	380.6					
200.00	7.8311	130.54	0.22781	444.1	200.00	8.7370	128.93	0.22451	429.5					
220.00	7.1211	137.08	0.23758	474.0	220.00	7.8399	135.85	0.23484	463.0	220.00	19.6784	118.27	0.20421	340.3
240.00	6.6028	143.19	0.24644	498.5	240.00	7.2145	142.18	0.24403	489.7	240.00	14.2159	131.50	0.22343	409.1
260.00	6.1926	149.07	0.25473	519.6	260.00	6.7351	148.21	0.25252	512.3	260.00	12.2674	139.92	0.23530	449.7
280.00	5.8555	154.82	0.26260	538.4	280.00	6.3472	154.06	0.26055	532.1	280.00	11.0672	147.15	0.24522	480.8
300.00	5.5694	160.49	0.27016	555.5	300.00	6.0221	159.81	0.26821	550.0	300.00	10.2049	153.83	0.25413	506.7
320.00	5.3212	166.11	0.27747	571.3	320.00	5.7425	165.49	0.27560	566.5	320.00	9.5351	160.21	0.26241	529.2
340.00	5.1022	171.72	0.28457	586.0	340.00	5.4977	171.15	0.28277	581.7	340.00	8.9895	166.39	0.27024	549.2
360.00	4.9066	177.32	0.29149	599.8	360.00	5.2802	176.80	0.28975	596.0	360.00	8.5305	172.45	0.27774	567.5
380.00	4.7300	182.94	0.29826	612.9	380.00	5.0848	182.45	0.29656	609.5	380.00	8.1351	178.45	0.28496	584.4
400.00	4.5692	188.58	0.30490	625.4	400.00	4.9075	188.12	0.30323	622.4	400.00	7.7885	184.40	0.29197	600.1
420.00	4.4217	194.24	0.31141	637.4	420.00	4.7454	193.82	0.30978	634.7	420.00	7.4804	190.34	0.29879	615.0
440.00	4.2857	199.94	0.31782	648.9	440.00	4.5964	199.54	0.31621	646.5	440.00	7.2035	196.26	0.30546	629.0
460.00	4.1596	205.68	0.32413	660.1	460.00	4.4584	205.30	0.32254	657.9	460.00	6.9523	202.20	0.31198	642.4
480.00	4.0421	211.46	0.33034	670.8	480.00	4.3303	211.09	0.32878	669.0	480.00	6.7229	208.15	0.31838	655.3
500.00	3.9323	217.28	0.33647	681.3	500.00	4.2107	216.93	0.33492	679.6	500.00	6.5118	214.12	0.32467	667.6