



MILWAUKEE U. S. A.

REFRIGERATION • AIR CONDITIONING

THERMODYNAMIC PROPERTIES OF REFRIGERANT 717 (AMMONIA)

Temp. - ° F	Pressure - Lb. per Sq. In.		Volume - Cu. Ft. per Lb.		Density - Lb. per Cu. Ft.		Enthalpy - Btu per Lb.			Entropy - Btu per (Lb.) (° R)		Temp. - ° F
	t	Absolute P	Gage P	Liquid v <sub>f</sub>	Vapor v <sub>g</sub>	Liquid 1/v <sub>f</sub>	Vapor 1/v <sub>g</sub>	Liquid h <sub>f</sub>	Latent h <sub>fg</sub>	Vapor h <sub>g</sub>	Liquid s <sub>f</sub>	
-60	5.55	18.6*	0.02278	44.73	43.91	0.02235	-21.2	610.8	589.6	-0.0517	1.4769	-60
-59	5.74	18.2*		43.37		.02306	-20.1	610.1	590.0	-.0490	1.4741	-59
-58	5.93	17.8*		42.05		.02378	-19.1	609.5	590.4	-.0464	1.4713	-58
-57	6.13	17.4*		40.79		.02452	-18.0	608.8	590.8	-.0438	1.4686	-57
-56	6.33	17.0*		39.56		.02528	-17.0	608.2	591.2	-.0412	1.4658	-56
-55	6.54	16.6*	0.02288	38.38	43.70	0.02605	-15.9	607.5	591.6	-0.0386	1.4631	-55
-54	6.75	16.2*		37.24		.02685	-14.8	606.9	592.1	-.0360	1.4604	-54
-53	6.97	15.7*		36.15		.02766	-13.8	606.2	592.4	-.0334	1.4577	-53
-52	7.20	15.3*		35.09		.02850	-12.7	605.6	592.9	-.0307	1.4551	-52
-51	7.43	14.8*		34.06		.02936	-11.7	604.9	593.2	-.0281	1.4524	-51
-50	7.67	14.3*	0.02299	33.08	43.49	0.03023	-10.6	604.3	593.7	-0.0256	1.4497	-50
-49	7.91	13.8*		32.12		.03113	-9.6	603.6	594.0	-.0230	1.4471	-49
-48	8.16	13.3*		31.20		.03205	-8.5	602.9	594.4	-.0204	1.4445	-48
-47	8.42	12.8*		30.31		.03299	-7.4	602.3	594.9	-.0179	1.4419	-47
-46	8.68	12.2*		29.45		.03395	-6.4	601.6	595.2	-0.0153	1.4393	-46
-45	8.95	11.7*	0.02310	28.62	43.28	0.03494	-5.3	600.9	595.6	-0.0127	1.4368	-45
-44	9.23	11.1*		27.82		.03595	-4.3	600.3	596.0	-.0102	1.4342	-44
-43	9.51	10.6*		27.04		.03698	-3.2	599.6	596.4	-.0076	1.4317	-43
-42	9.81	10.0*		26.29		.03804	-2.1	598.9	596.8	-.0051	1.4292	-42
-41	10.10	9.3*		25.56		.03912	-1.1	598.3	597.2	-.0025	1.4267	-41
-40	10.41	8.7*	0.02322	24.86	43.07	0.04022	0.0	597.6	597.6	0.0000	1.4242	-40
-39	10.72	8.1*		24.18		.04135	1.1	596.9	598.0	.0025	1.4217	-39
-38	11.04	7.4*		23.53		.04251	2.1	596.2	598.3	.0051	1.4193	-38
-37	11.37	6.8*		22.89		.04369	3.2	595.5	598.7	.0076	1.4169	-37
-36	11.71	6.1*		22.27		.04489	4.3	594.8	599.1	.0101	1.4144	-36
-35	12.05	5.4*	0.02333	21.68	42.86	0.04613	5.3	594.2	599.5	0.0126	1.4120	-35
-34	12.41	4.7*		21.10		.04739	6.4	593.5	599.9	.0151	1.4096	-34
-33	12.77	3.9*		20.54		.04868	7.4	592.8	600.2	.0176	1.4072	-33
-32	13.14	3.2*		20.00		.04999	8.5	592.1	600.6	.0201	1.4048	-32
-31	13.52	2.4*		19.48		.05134	9.6	591.4	601.0	.0226	1.4025	-31
-30	13.90	1.6*	0.02345	18.97	42.65	0.05271	10.7	590.7	601.4	0.0250	1.4001	-30
-29	14.30	0.8*		18.48		.05411	11.7	590.0	601.7	.0275	1.3978	-29
-28	14.71	0.0		18.00		.05555	12.8	589.3	602.1	.0300	1.3955	-28
-27	15.12	0.4		17.54		.05701	13.9	588.6	602.5	.0325	1.3932	-27
-26	15.55	0.8		17.09		.05850	14.9	587.9	602.8	.0350	1.3909	-26
-25	15.98	1.3	0.02357	16.66	42.44	0.06003	16.0	587.2	603.2	0.0374	1.3886	-25
-24	16.42	1.7		16.24		.06158	17.1	586.5	603.6	.0399	1.3863	-24
-23	16.88	2.2		15.83		.06317	18.1	585.8	603.9	.0423	1.3840	-23
-22	17.34	2.6		15.43		.06479	19.2	585.1	604.3	.0448	1.3818	-22
-21	17.81	3.1		15.05		.06644	20.3	584.3	604.6	.0472	1.3796	-21
-20	18.30	3.6	0.02369	14.68	42.22	0.06813	21.4	583.6	605.0	0.0497	1.3774	-20
-19	18.79	4.1		14.32		.06985	22.4	582.9	605.3	.0521	1.3752	-19
-18	19.30	4.6		13.97		.07161	23.5	582.2	605.7	.0545	1.3729	-18
-17	19.81	5.1		13.62		.07340	24.6	581.5	606.1	.0570	1.3708	-17
-16	20.34	5.6		13.29		.07522	25.6	580.8	606.4	.0594	1.3686	-16
-15	20.88	6.2	0.02381	12.97	42.00	0.07709	26.7	580.0	606.7	0.0618	1.3664	-15
-14	21.43	6.7		12.66		.07898	27.8	579.3	607.1	.0642	1.3643	-14
-13	21.99	7.3		12.36		.08092	28.9	578.6	607.5	.0666	1.3621	-13
-12	22.56	7.9		12.06		.08289	30.0	577.8	607.8	.0690	1.3600	-12
-11	23.15	8.5		11.78		.08490	31.0	577.1	608.1	.0714	1.3579	-11
-10	23.74	9.0	0.02393	11.50	41.78	0.08695	32.1	576.4	608.5	0.0738	1.3558	-10
-9	24.35	9.7		11.23		.08904	33.2	575.6	608.8	.0762	1.3537	-9
-8	24.97	10.3		10.97		.09117	34.3	574.9	609.2	.0786	1.3516	-8
-7	25.61	10.9		10.71		.09334	35.4	574.1	609.5	.0809	1.3495	-7
-6	26.26	11.6		10.47		.09555	36.4	573.4	609.8	.0833	1.3474	-6
-5	26.92	12.2	0.02406	10.23	41.56	0.09780	37.5	572.6	610.1	0.0857	1.3454	-5
-4	27.59	12.9		9.991		.1001	38.6	571.9	610.5	.0880	1.3433	-4
-3	28.28	13.6		9.763		.1024	39.7	571.1	610.8	.0904	1.3413	-3
-2	28.98	14.3		9.541		.1048	40.7	570.4	611.1	.0928	1.3393	-2
-1	29.69	15.0		9.326		.1072	41.8	569.6	611.4	.0951	1.3372	-1

Inches of mercury below one atmosphere



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	Absolute P	Gage P	Liquid v <sub>f</sub>	Vapor v <sub>g</sub>	Liquid 1/v <sub>f</sub>	Vapor 1/v <sub>g</sub>	Liquid h <sub>f</sub>	Latent h <sub>fg</sub>	Vapor h <sub>g</sub>	Liquid s <sub>f</sub>	Vapor s <sub>g</sub>	
60	107.6	92.9	0.02597	2.751	38.50	0.3635	109.2	518.1	627.3	0.2322	1.2294	60
61	109.6	94.9		2.703		.3700	110.3	517.2	627.5	.2344	1.2278	61
62	111.6	96.9		2.656		.3765	111.5	516.2	627.7	.2365	1.2262	62
63	113.6	98.9		2.610		.3832	112.6	515.3	627.9	.2387	1.2247	63
64	115.7	101.0		2.565		.3899	113.7	514.3	628.0	.2408	1.2231	64
65	117.8	103.1	0.02614	2.520	38.25	0.3968	114.8	513.4	628.2	0.2430	1.2216	65
66	120.0	105.3		2.477		.4037	116.0	512.4	628.4	.2451	1.2201	66
67	122.1	107.4		2.435		.4108	117.1	511.5	628.6	.2473	1.2186	67
68	124.3	109.6		2.393		.4179	118.3	510.5	628.8	.2494	1.2170	68
69	126.5	111.8		2.352		.4251	119.4	509.5	628.9	.2515	1.2155	69
70	128.8	114.1	0.02632	2.312	38.00	0.4325	120.5	508.6	629.1	0.2537	1.2140	70
71	131.1	116.4		2.273		.4399	121.7	507.6	629.3	.2558	1.2125	71
72	133.4	118.7		2.235		.4474	122.8	506.6	629.4	.2579	1.2110	72
73	135.7	121.0		2.197		.4551	124.0	505.6	629.6	.2601	1.2095	73
74	138.1	123.4		2.161		.4628	125.1	504.7	629.8	.2622	1.2080	74
75	140.5	125.8	0.02650	2.125	37.74	0.4707	126.2	503.7	629.9	0.2643	1.2065	75
76	143.0	128.3		2.089		.4786	127.4	502.7	630.1	.2664	1.2050	76
77	145.4	130.7		2.055		.4867	128.5	501.7	630.2	.2685	1.2035	77
78	147.9	133.2		2.021		.4949	129.7	500.7	630.4	.2706	1.2020	78
79	150.5	135.8		1.988		.5031	130.8	499.7	630.5	.2728	1.2006	79
80	153.0	138.3	0.02668	1.955	37.48	0.5115	132.0	498.7	630.7	0.2749	1.1991	80
81	155.6	140.9		1.923		.5200	133.1	497.7	630.8	.2769	1.1976	81
82	158.3	143.6		1.892		.5287	134.3	496.7	631.0	.2791	1.1962	82
83	161.0	146.3		1.861		.5374	135.4	495.7	631.1	.2812	1.1947	83
84	163.7	149.0		1.831		.5462	136.6	494.7	631.3	0.2833	1.1933	84
85	166.4	151.7	0.02687	1.801	37.21	0.5552	137.8	493.6	631.4	0.2854	1.1918	85
86	169.2	154.5		1.772		.5643	138.9	492.6	631.5	.2875	1.1904	86
87	172.0	157.3		1.744		.5735	140.1	491.6	631.7	.2895	1.1889	87
88	174.8	160.1		1.716		.5828	141.2	490.6	631.8	.2917	1.1875	88
89	177.7	163.0		1.688		.5923	142.4	489.5	631.9	.2937	1.1860	89
90	180.6	165.9	0.02707	1.661	36.94	0.6019	143.5	488.5	632.0	0.2958	1.1846	90
91	183.6	168.9		1.635		.6116	144.7	487.4	632.1	.2979	1.1832	91
92	186.6	171.9		1.609		.6214	145.8	486.4	632.2	.3000	1.1818	92
93	189.6	174.9		1.584		.6314	147.0	485.3	632.3	.3021	1.1804	93
94	192.7	178.0		1.559		.6415	148.2	484.3	632.5	.3041	1.1789	94
95	195.8	181.1	0.02727	1.535	36.67	0.6517	149.4	483.2	632.6	0.3062	1.1775	95
96	198.9	184.2		1.510		.6620	150.5	482.1	632.6	.3083	1.1761	96
97	202.1	187.4		1.487		.6725	151.7	481.1	632.8	.3104	1.1747	97
98	205.3	190.6		1.464		.6832	152.9	480.0	632.9	.3125	1.1733	98
99	208.6	193.9		1.441		.6939	154.0	478.9	632.9	.3145	1.1719	99
100	211.9	197.2	0.02748	1.419	36.40	0.7048	155.2	477.8	633.0	0.3166	1.1705	100
101	215.2	200.5		1.397		.7159	156.4	476.7	633.1	.3187	1.1691	101
102	218.6	203.9		1.375		.7270	157.6	475.6	633.2	.3207	1.1677	102
103	222.0	207.3		1.354		.7384	158.7	474.6	633.3	.3228	1.1663	103
104	225.4	210.7		1.334		.7498	159.9	473.5	633.4	.3248	1.1649	104
105	228.9	214.2	0.02769	1.313	36.12	0.7615	161.1	472.3	633.4	0.3269	1.1635	105
106	232.5	217.8		1.293		.7732	162.3	471.2	633.5	.3289	1.1621	106
107	236.0	221.3		1.274		.7852	163.5	470.1	633.6	.3310	1.1607	107
108	239.7	225.0		1.254		.7972	164.6	469.0	633.6	.3330	1.1593	108
109	243.3	228.6		1.235		.8095	165.8	467.9	633.7	.3351	1.1580	109
110	247.0	232.3	0.02790	1.217	35.84	0.8219	167.0	466.7	633.7	0.3372	1.1566	110
111	250.8	236.1		1.198		.8344	168.2	465.6	633.8	.3392	1.1552	111
112	254.5	239.8		1.180		.8471	169.4	464.4	633.8	.3413	1.1538	112
113	258.4	243.7		1.163		.8600	170.6	463.3	633.9	.3433	1.1524	113
114	262.2	247.5		1.145		.8730	171.8	462.1	633.9	.3453	1.1510	114
115	266.2	251.5	0.02813	1.128	35.55	0.8862	173.0	460.9	633.9	0.3474	1.1497	115
116	270.1	255.4		1.112		.8996	174.2	459.8	634.0	.3495	1.1483	116
117	274.1	259.4		1.095		.9132	175.4	458.6	634.0	.3515	1.1469	117
118	278.2	263.5		1.079		.9269	176.6	457.4	634.0	.3535	1.1455	118
119	282.3	267.6		1.063		.9408	177.8	456.2	634.0	.3556	1.1441	119
120	286.4	271.7	0.02836	1.047	35.26	0.9549	179.0	455.0	634.0	0.3576	1.1427	120