

TEMPERATURE - PRESSURE CHART NATURAL REFRIGERANTS



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At Sea Level, psig

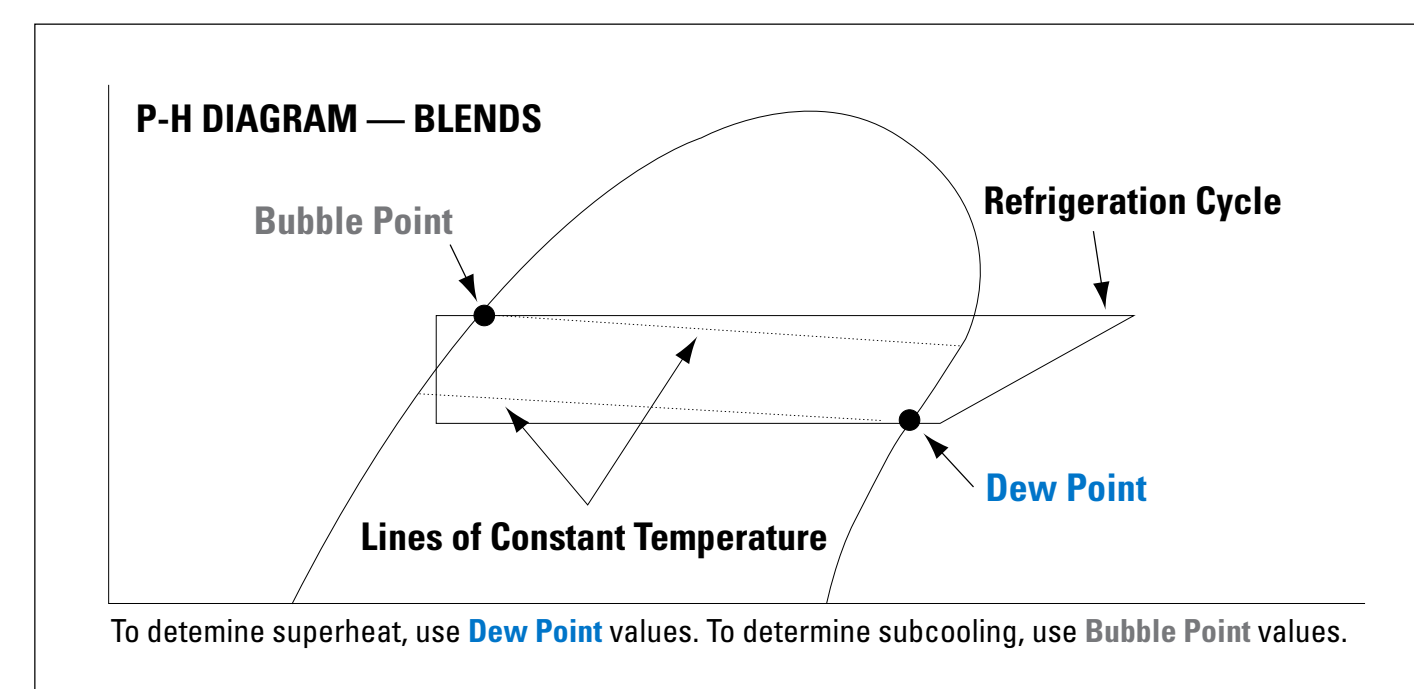
TEMP.		REFRIGERANT TYPE (SAFETY CLASS) REFRIGERANT (SPORLAN LETTER CODE)					
°F	°C	HC (A3) 170(K)	HC (A3) 290(O)	HC (A3) 441A	HC (A3) 600a(U)	AMMONIA (B2L) 717(A)	CO2 (A1) 744
-50	-45.6	78.9	4.3	21.1	23.6	14.3	103.4
-45	-42.8	88.1	0.9	19.7	22.6	11.7	116.6
-40	-40.0	98.1	1.4	18.1	21.4	8.8	131.0
-35	-37.2	108.7	3.4	16.3	20.2	5.4	146.5
-30	-34.4	120.0	5.7	14.3	18.8	1.6	163.1
-29	-33.9	122.4	6.1	13.8	18.5	0.8	166.6
-28	-33.3	124.7	6.6	13.4	18.1	0.0	170.1
-27	-32.8	127.1	7.1	12.9	17.8	0.4	173.7
-26	-32.2	129.6	7.6	12.5	17.5	0.8	177.3
-25	-31.7	132.1	8.1	12.0	17.2	1.3	181.0
-24	-31.1	134.6	8.6	11.5	16.8	1.7	184.8
-23	-30.6	137.1	9.1	11.0	16.5	2.2	188.5
-22	-30.0	139.7	9.6	10.5	16.2	2.6	192.4
-21	-29.4	142.3	10.2	10.0	15.8	3.1	196.3
-20	-28.9	144.9	10.7	9.5	15.4	3.6	200.2
-19	-28.3	147.6	11.3	9.0	15.1	4.1	204.2
-18	-27.8	150.3	11.8	8.4	14.7	4.6	208.3
-17	-27.2	153.0	12.4	7.9	14.3	5.1	212.4
-16	-26.7	155.7	13.0	7.3	13.9	5.6	216.5
-15	-26.1	158.5	13.6	6.7	13.5	6.2	220.8
-14	-25.6	161.4	14.2	6.1	13.1	6.7	225.0
-13	-25.0	164.2	14.8	5.5	12.7	7.3	229.4
-12	-24.4	167.1	15.4	4.9	12.2	7.8	233.8
-11	-23.9	170.0	16.1	4.3	11.8	8.4	238.2
-10	-23.3	173.0	16.7	3.7	11.4	9.0	242.7
-9	-22.8	176.0	17.4	3.0	10.9	9.6	247.3
-8	-22.2	179.0	18.0	2.4	10.4	10.3	251.9
-7	-21.7	182.1	18.7	1.7	10.0	10.9	256.6
-6	-21.1	185.2	19.4	1.0	9.5	11.5	261.3
-5	-20.6	188.3	20.1	0.3	9.0	12.2	266.1
-4	-20.0	191.5	20.8	0.2	8.5	12.9	271.0
-3	-19.4	194.7	21.5	0.6	8.0	13.6	275.9
-2	-18.9	197.9	22.2	0.9	7.5	14.3	280.9
-1	-18.3	201.2	22.9	1.3	7.0	15.0	285.9
0	-17.8	204.5	23.7	1.7	6.4	15.7	291.0
1	-17.2	207.9	24.5	2.1	5.9	16.4	296.2
2	-16.7	211.3	25.2	2.5	5.3	17.2	301.5
3	-16.1	214.7	26.0	2.9	4.8	18.0	306.8
4	-15.6	218.2	26.8	3.3	4.2	18.8	312.1
5	-15.0	221.7	27.6	3.7	3.6	19.6	317.6
6	-14.4	225.2	28.4	4.1	3.0	20.4	323.1
7	-13.9	228.8	29.2	4.5	2.4	21.2	328.6
8	-13.3	232.4	30.1	5.0	1.8	22.1	334.2
9	-12.8	236.0	30.9	5.4	1.2	22.9	339.9

TEMP.		REFRIGERANT TYPE (SAFETY CLASS) REFRIGERANT (SPORLAN LETTER CODE)					
°F	°C	HC (A3) 170(K)	HC (A3) 290(O)	HC (A3) 441A	HC (A3) 600a(U)	AMMONIA (B2L) 717(A)	CO2 (A1) 744
10	-12.2	239.7	31.8	5.8	0.5	23.8	345.7
11	-11.7	243.5	32.7	6.3	0.0	24.7	351.5
12	-11.1	247.2	33.6	6.8	0.4	25.6	357.4
13	-10.6	251.1	34.5	7.2	0.7	26.5	363.4
14	-10.0	254.9	35.4	7.7	1.0	27.5	369.5
15	-9.4	258.8	36.3	8.2	1.4	28.4	375.6
16	-8.9	262.7	37.2	8.7	1.7	29.4	381.8
17	-8.3	266.7	38.2	9.2	2.1	30.4	388.0
18	-7.8	270.7	39.2	9.7	2.4	31.4	394.3
19	-7.2	274.8	40.1	10.3	2.8	32.4	400.7
20	-6.7	278.9	41.1	10.8	3.2	33.5	407.2
21	-6.1	283.0	42.1	11.3	3.5	34.6	413.8
22	-5.6	287.2	43.2	11.9	3.9	35.7	420.4
23	-5.0	291.4	44.2	12.5	4.3	36.8	427.1
24	-4.4	295.7	45.2	13.0	4.7	37.9	433.8
25	-3.9	300.0	46.3	13.6	5.1	39.0	440.7
26	-3.3	304.4	47.4	14.2	5.5	40.2	447.6
27	-2.8	308.8	48.5	14.8	5.9	41.4	454.6
28	-2.2	313.2	49.6	15.4	6.3	42.6	461.7
29	-1.7	317.7	50.7	16.0	6.8	43.8	468.8
30	-1.1	322.3	51.8	16.6	7.2	45.0	476.1
31	-0.6	326.8	53.0	17.3	7.6	46.3	483.4
32	0.0	331.5	54.1	17.9	8.1	47.6	490.8
33	0.6	336.1	55.3	18.6	8.5	48.9	498.3
34	1.1	340.9	56.5	19.2	9.0	50.2	505.8
35	1.7	345.6	57.7	19.9	9.4	51.6	513.4
36	2.2	350.4	58.9	20.6	9.9	52.9	521.2
37	2.8	355.3	60.1	21.3	10.4	54.3	529.0
38	3.3	360.2	61.4	22.0	10.9	55.7	536.9
39	3.9	365.2	62.7	22.7	11.4	57.2	544.8
40	4.4	370.2	63.9	23.4	11.9	58.6	552.9
41	5.0	375.2	65.2	24.2	12.4	60.1	561.0
42	5.6	380.3	66.6	24.9	12.9	61.6	569.3
43	6.1	385.5	67.9	25.7	13.4	63.1	577.6
44	6.7	390.7	69.2	26.4	14.0	64.7	586.0
45	7.2	395.9	70.6	27.2	14.5	66.3	594.5
46	7.8	401.2	72.0	28.0	15.0	67.9	603.1
48	8.9	412.0	74.8	29.6	16.2	71.1	620.5
50	10.0	422.9	77.6	31.3	17.3	74.5	638.3
52	11.1	434.1	80.6	67.7	18.5	78.0	656.5
54	12.2	445.5	83.6	70.2	19.7	81.6	675.0
55	12.8	451.2	85.1	71.4	20.3	83.4	684.5
56	13.3	457.1	86.7	72.7	20.9	85.2	694.0
58	14.4	468.9	89.8	75.3	22.2	89.0	713.3

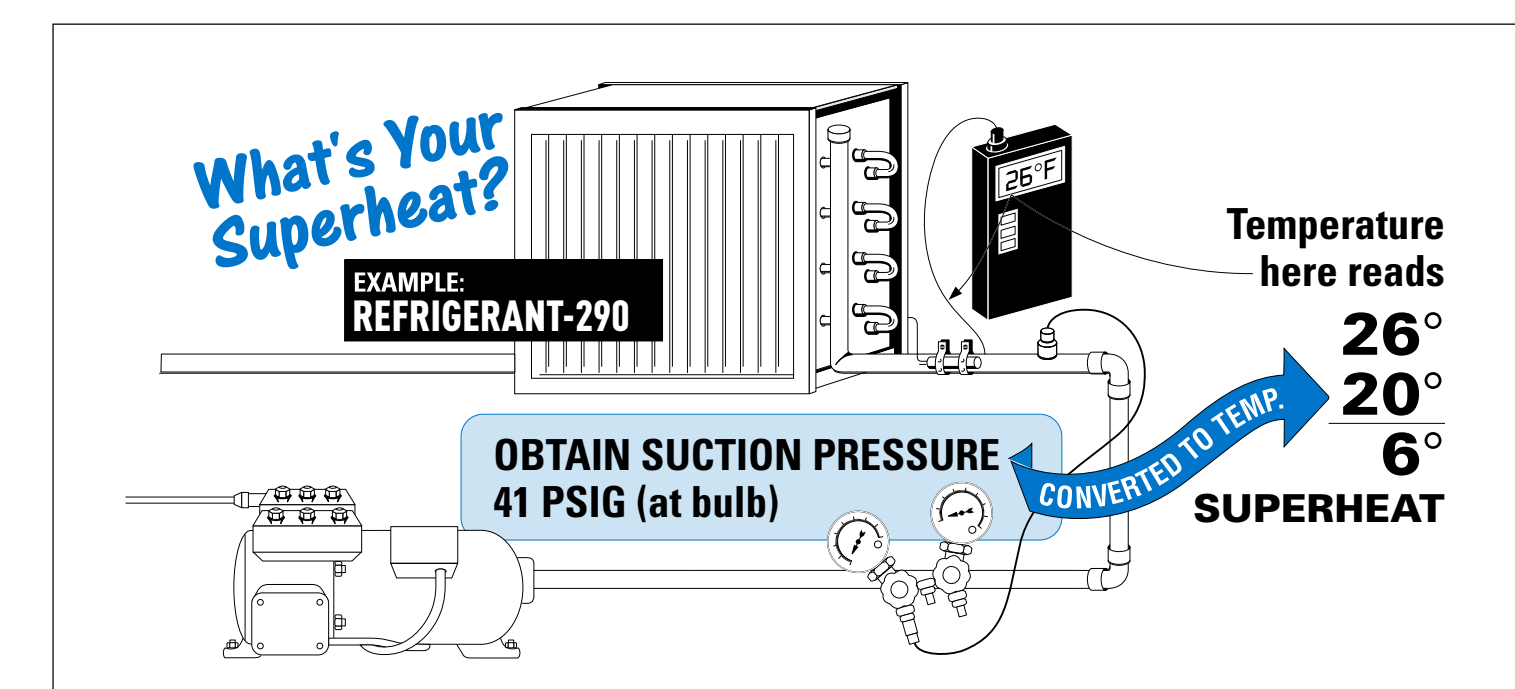
TEMP.		REFRIGERANT TYPE (SAFETY CLASS) REFRIGERANT (SPORLAN LETTER CODE)					
°F	°C	HC (A3) 170(K)	HC (A3) 290(O)	HC (A3) 441A	HC (A3) 600a(U)	AMMONIA (B2L) 717(A)	CO2 (A1) 744
60	15.6	480.9	93.0	77.9	23.5	92.9	733.1
62	16.7	493.2	96.3	80.6	24.9	96.9	753.2
64	17.8	505.7	99.7	83.4	26.3	101.1	773.8
65	18.3	512.1	101.4	84.7	27.0	103.2	784.2
66	18.9	518.5	103.1	86.2	27.7	105.3	794.8
68	20.0	531.4	106.6	89.0	29.1	109.7	816.2
70	21.1	544.7	110.2	91.9	30.6	114.2	838.1
72	22.2	558.2	113.9	94.9	32.2	118.8	860.5
74	23.3	571.9	117.6	97.9	33.7	123.5	883.3
75	23.9	578.9	119.5	99.5	34.5	125.9	894.9
76	24.4	585.9	121.4	101.0	35.3	128.3	906.7
78	25.6	600.2	125.4	104.2	37.0	133.3	930.5
80	26.7	614.8	129.3	107.4	38.7	138.4	954.9
82	27.8	629.7	133.4	110.7	40.4	143.7	979.8
84	28.9	644.9	137.6	114.1	42.2	149.1	1005.4
85	29.4	652.7	139.7	115.8	43.1	151.8	1018.4
86	30.0	660.5	141.8	117.5	44.0	154.6	1031.6
88	31.1	676.4	146.1	120.9	45.9	160.3	*
90	32.2	*	150.5	124.5	47.8	166.1	*
92	33.3	*	155.0	128.1	49.7	172.0	*
94	34.4	*	159.6	131.8	51.7	178.1	*
95	35.0	*	161.9	133.6	52.7	181.2	*
96	35.6	*	164.3	135.5	53.7	184.4	*
98	36.7	*	169.1	139.3	55.8	190.8	*
100	37.8	*	173.9	143.2	57.9	197.3	*
102	38.9	*	178.9	147.2	60.1	204.0	*
104	40.0	*	183.9	151.2	62.3	210.9	*
105	40.6	*	186.5	153.2	63.5	214.4	*
106	41.1	*	189.1	155.3	64.6	217.9	*
108	42.2	*	194.3	159.5	66.9	225.1	*
110	43.3	*	199.6	163.7	69.3	232.5	*
112	44.4	*	205.1	168.0	71.7	240.0	*
114	45.6	*	210.6	172.4	74.2	247.7	*
115	46.1	*	213.4	174.6	75.5	251.6	*
120	48.9	*	227.8	186.0	82.0	271.9	*
125	51.7	*	242.9	197.9	88.8	293.3	*
130	54.4	*	258.7	210.3	95.9	315.8	*
135	57.2	*	275.1	223.1	103.5	339.6	*
140	60.0	*	292.3	236.5	111.4	364.7	*
145	62.8	*	310.2	250.5	119.6	391.0	*
150	65.6	*	328.9	264.9	128.3	418.7	*
155	68.3	*	348.4	279.9	137.4	447.8	*
160	71.1	*	368.7	295.5	146.9	478.3	*
165	73.9	*	389.9	311.6	156.8	510.2	*

To determine **Subcooling** for 400-Series blends, use **Bubble Point** in Gray.
To determine **Superheat** for 400-Series blends, use **Dew Point** in Blue.

Pressure, psig (pounds per square inch gauge), **BOLD**
Vacuum, inhg (inches of Mercury), *Italics*



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*Exceeds critical temperature



TEMPERATURE - PRESSURE CHART NATURAL REFRIGERANTS



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At Sea Level, barg

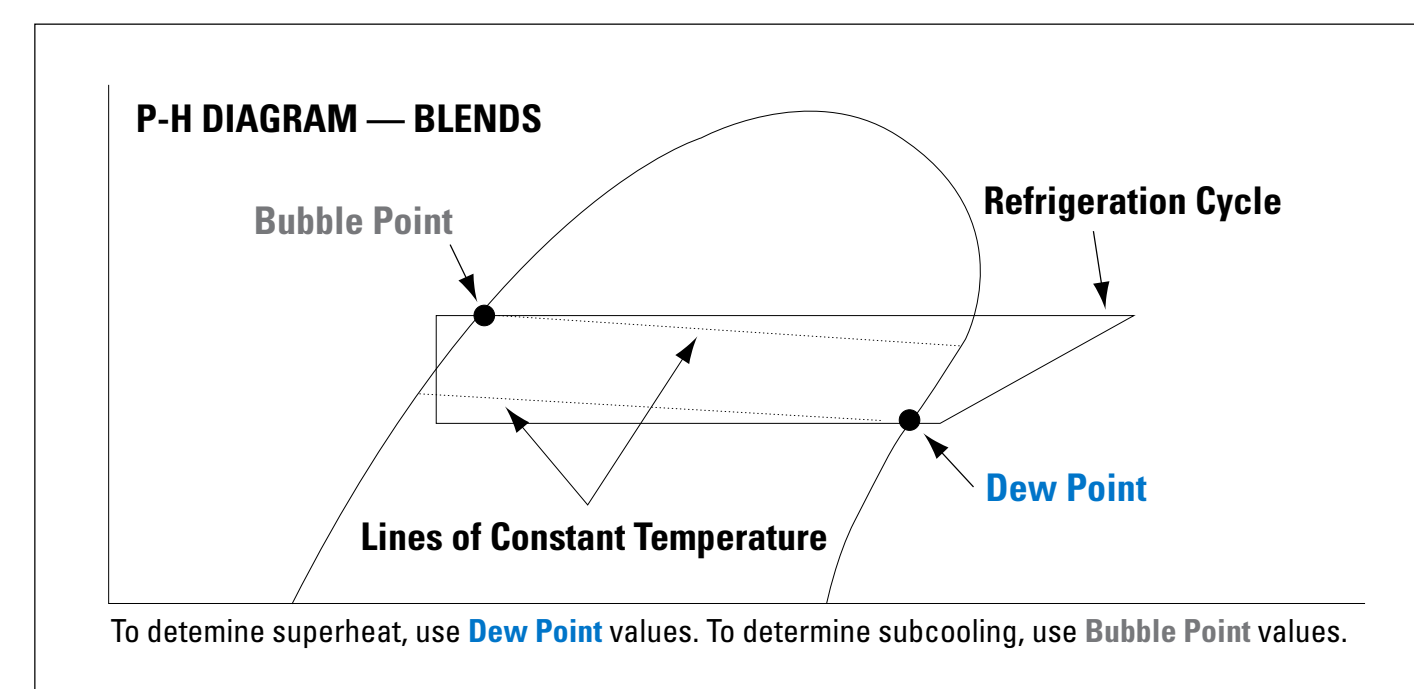
TEMP.		REFRIGERANT TYPE (SAFETY CLASS) REFRIGERANT (SPORLAN LETTER CODE)					
°C	°F	HC (A3) 170(K)	HC (A3) 290(O)	HC (A3) 441A	HC (A3) 600a(U)	AMMONIA (B2L) 717(A)	CO2 (A1) 744
-45	-49.0	5.58	82	520	584	341	7.32
-42	-43.6	6.28	0.02	480	556	267	8.33
-40	-40.0	6.77	0.11	450	535	212	9.04
-39	-38.2	7.03	0.16	434	524	183	9.42
-38	-36.4	7.30	0.21	417	512	152	9.81
-37	-34.6	7.57	0.26	400	500	120	10.20
-36	-32.8	7.84	0.32	382	487	87	10.61
-35	-31.0	8.13	0.37	363	474	52	11.02
-34	-29.2	8.42	0.43	344	460	15	11.45
-33	-27.4	8.71	0.49	323	446	0.03	11.89
-32	-25.6	9.02	0.55	302	432	0.08	12.34
-31	-23.8	9.33	0.61	280	416	0.14	12.80
-30	-22.0	9.64	0.68	258	400	0.19	13.28
-29	-20.2	9.97	0.75	234	384	0.25	13.76
-28	-18.4	10.30	0.81	210	367	0.32	14.26
-27	-16.6	10.64	0.89	184	349	0.38	14.77
-26	-14.8	10.98	0.96	158	331	0.45	15.29
-25	-13.0	11.34	1.03	131	312	0.51	15.83
-24	-11.2	11.70	1.11	103	292	0.59	16.37
-23	-9.4	12.06	1.19	73	272	0.66	16.94
-22	-7.6	12.44	1.27	43	251	0.74	17.51
-21	-5.8	12.82	1.36	12	229	0.82	18.10
-20	-4.0	13.22	1.45	0.03	206	0.90	18.70
-19	-2.2	13.61	1.53	0.07	183	0.99	19.31
-18	-0.4	14.02	1.63	0.12	159	1.08	19.94
-17	1.4	14.44	1.72	0.17	134	1.17	20.58
-16	3.2	14.86	1.82	0.22	109	1.26	21.24
-15	5.0	15.30	1.92	0.27	82	1.36	21.91
-14	6.8	15.74	2.02	0.32	55	1.46	22.59
-13	8.6	16.19	2.12	0.37	27	1.57	23.29
-12	10.4	16.65	2.23	0.43	0.00	1.68	24.01
-11	12.2	17.11	2.34	0.49	0.04	1.79	24.74
-10	14.0	17.59	2.45	0.55	0.08	1.91	25.49
-9	15.8	18.07	2.57	0.61	0.13	2.03	26.25
-8	17.6	18.57	2.69	0.67	0.17	2.15	27.03
-7	19.4	19.07	2.81	0.74	0.22	2.28	27.82

TEMP.		REFRIGERANT TYPE (SAFETY CLASS) REFRIGERANT (SPORLAN LETTER CODE)					
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-6	21.2	19.58	2.93	0.80	0.26	2.41	28.63
-5	23.0	20.11	3.06	0.87	0.31	2.55	29.46
-4	24.8	20.64	3.19	0.94	0.36	2.69	30.30
-3	26.6	21.18	3.32	1.02	0.41	2.83	31.16
-2	28.4	21.73	3.46	1.09	0.46	2.98	32.04
-1	30.2	22.30	3.60	1.17	0.51	3.14	32.94
0	32.0	22.87	3.74	1.25	0.57	3.29	33.85
1	33.8	23.45	3.89	1.33	0.63	3.46	34.78
2	35.6	24.04	4.04	1.41	0.68	3.62	35.73
3	37.4	24.65	4.19	1.50	0.74	3.80	36.70
4	39.2	25.26	4.35	1.59	0.80	3.97	37.69
5	41.0	25.88	4.51	1.68	0.87	4.16	38.69
6	42.8	26.52	4.67	1.77	0.93	4.35	39.72
7	44.6	27.17	4.84	1.87	1.00	4.54	40.77
8	46.4	27.82	5.01	1.97	1.07	4.74	41.83
9	48.2	28.49	5.19	2.07	1.13	4.94	42.92
10	50.0	29.17	5.37	2.17	1.21	5.15	44.02
11	51.8	29.87	5.55	4.67	1.28	5.37	45.15
12	53.6	30.57	5.73	4.82	1.35	5.59	46.30
13	55.4	31.29	5.92	4.97	1.43	5.81	47.47
14	57.2	32.01	6.12	5.13	1.51	6.05	48.66
15	59.0	32.75	6.32	5.29	1.59	6.29	49.87
16	60.8	33.51	6.52	5.46	1.67	6.53	51.11
17	62.6	34.27	6.72	5.63	1.76	6.78	52.37
18	64.4	35.05	6.93	5.80	1.84	7.04	53.65
19	66.2	35.85	7.15	5.97	1.93	7.30	54.96
20	68.0	36.66	7.36	6.15	2.02	7.58	56.29
21	69.8	37.48	7.59	6.33	2.11	7.85	57.65
22	71.6	38.31	7.81	6.52	2.21	8.14	59.03
23	73.4	39.16	8.05	6.70	2.31	8.43	60.44
24	75.2	40.02	8.28	6.89	2.41	8.73	61.88
25	77.0	40.90	8.52	7.09	2.51	9.03	63.34
26	78.8	41.80	8.77	7.29	2.61	9.35	64.84
27	80.6	42.71	9.01	7.49	2.72	9.67	66.36
28	82.4	43.64	9.27	7.69	2.82	9.99	67.92
29	84.2	44.59	9.53	7.90	2.93	10.33	69.51

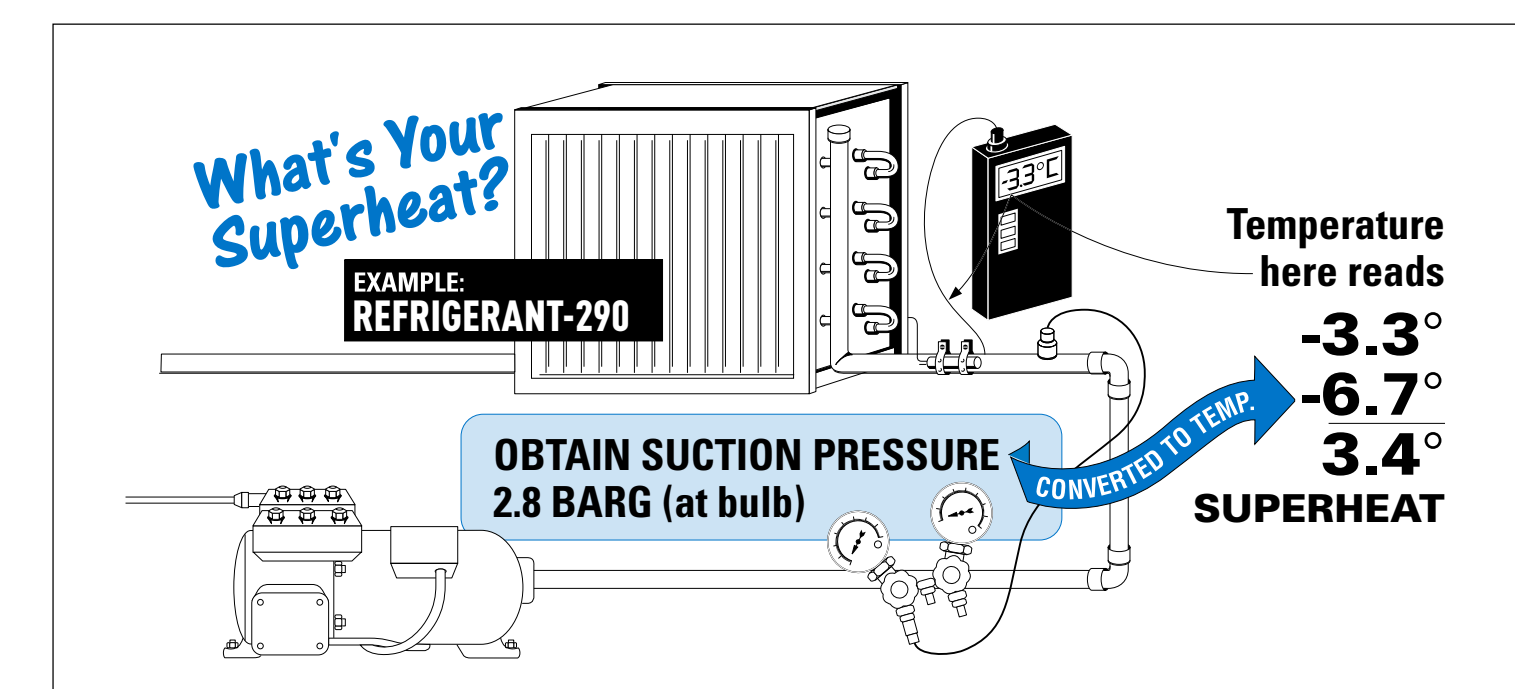
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°C	°F	HC (A3) 170(K)	HC (A3) 290(O)	HC (A3) 441A	HC (A3) 600a(U)	AMMONIA (B2L) 717(A)	CO2 (A1) 744
30	86.0	45.55	9.79	8.11	3.05	10.67	71.14
31	87.8	46.54	10.06	8.33	3.16	11.02	*
32	89.6	47.55	10.33	8.55	3.28	11.38	*
33	91.4	*	10.61	8.77	3.40	11.75	*
34	93.2	*	10.89	9.00	3.52	12.12	*
35	95.0	*	11.18	9.23	3.65	12.51	*
36	96.8	*	11.47	9.46	3.78	12.90	*
37	98.6	*	11.77	9.70	3.91	13.30	*
38	100.4	*	12.07	9.94	4.04	13.71	*
39	102.2	*	12.38	10.19	4.17	14.13	*
40	104.0	*	12.69	10.44	4.31	14.55	*
41	105.8	*	13.01	10.69	4.45	14.99	*
42	107.6	*	13.34	10.95	4.60	15.44	*
43	109.4	*	13.67	11.21	4.74	15.89	*
44	111.2	*	14.00	11.48	4.89	16.35	*
45	113.0	*	14.34	11.75	5.04	16.83	*
46	114.8	*	14.69	12.02	5.20	17.31	*
47	116.6	*	15.04	12.30	5.36	17.80	*
48	118.4	*	15.40	12.58	5.52	18.30	*
49	120.2	*	15.76	12.87	5.68	18.82	*
50	122.0	*	16.13	13.16	5.85	19.34	*
52	125.6	*	16.89	13.76	6.19	20.42	*
54	129.2	*	17.67	14.37	6.55	21.54	*
55	131.0	*	18.07	14.69	6.73	22.11	*
56	132.8	*	18.48	15.00	6.92	22.70	*
58	136.4	*	19.31	15.65	7.30	23.90	*
60	140.0	*	20.17	16.32	7.69	25.16	*
62	143.6	*	21.05	17.01	8.10	26.45	*
64	147.2	*	21.96	17.72	8.52	27.80	*
65	149.0	*	22.43	18.08	8.74	28.49	*
66	150.8	*	22.90	18.44	8.96	29.19	*
68	154.4	*	23.87	19.19	9.41	30.64	*
70	158.0	*	24.87	19.95	9.88	32.13	*
72	161.6	*	25.89	20.74	10.36	33.68	*
74	165.2	*	26.95	21.54	10.85	35.28	*
75	167.0	*	27.49	21.95	11.11	36.10	*

To determine **Subcooling** for 400-Series blends, use **Bubble Point** in Gray.
To determine **Superheat** for 400-Series blends, use **Dew Point** in Blue.

Pressure, barg (bar guage), **BOLD**
Vacuum, mmhg (millimeters of Mercury), *Italics*



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*Exceeds critical temperature

