

DuPont Refrigerants R-12 and R-11 Replacements

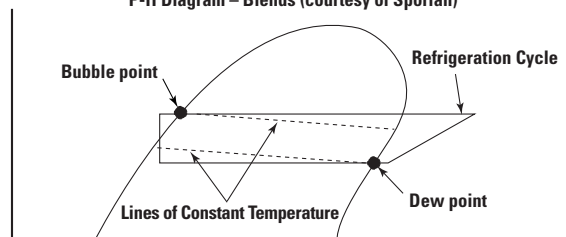
PRESSURE-TEMPERATURE GUIDE

Key: **Green** (in of Hg) = Vacuum
 Black (psig) = Saturated Vapor (calculate superheat)
Bold (psig) = Saturated Liquid (calculate subcooling)

For 5,000 ft. Elevations: psig + 2.5

°F	Freon® 12 (R-12)	ISCEON® 39TC® (R-423A)	Suva® 134a (R-134a)	Suva® MP39 (R-401A)	Suva® MP66 (R-401B)	Suva® 409A (R-409A)	Suva® 123 (R-123)	Freon® 11 (R-11)
-50	15.4	20.0	18.7	17.9	16.8	18.7	29.2	28.9
-48	14.6	19.4	18.0	17.2	16.0	18.0	29.1	28.8
-46	13.8	18.7	17.3	16.4	15.2	17.2	29.1	28.7
-44	12.9	18.0	16.5	15.6	14.3	16.5	29.0	28.6
-42	12.0	17.3	15.7	14.7	13.3	15.6	28.9	28.5
-40	11.0	16.5	14.8	13.8	12.4	14.8	28.9	28.4
-38	10.0	15.7	13.9	12.9	11.3	13.9	28.8	28.3
-36	8.9	14.9	13.0	11.9	10.3	13.0	28.7	28.2
-34	7.8	14.0	12.0	10.9	9.2	12.0	28.6	28.1
-32	6.7	13.1	10.9	9.8	8.0	10.9	28.5	28.0
-30	5.5	12.1	9.8	8.7	6.8	9.9	28.4	27.8
-28	4.3	11.1	8.7	7.5	5.5	8.8	28.3	27.7
-26	3.0	10.0	7.5	6.2	4.2	7.6	28.2	27.5
-24	1.7	8.9	6.3	5.0	2.8	6.4	28.1	27.4
-22	0.3	7.8	5.0	3.6	1.4	5.1	27.9	27.2
-20	0.5	6.6	3.7	2.2	0.1	3.8	27.8	27.0
-18	1.3	5.3	2.3	0.8	0.8	2.4	27.6	26.8
-16	2.0	4.0	0.8	0.4	1.6	0.9	27.5	26.7
-14	2.8	2.6	0.4	1.1	2.5	0.3	27.3	26.5
-12	3.6	1.2	1.1	1.9	3.3	1.0	27.2	26.2
-10	4.5	0.1	1.9	2.8	4.2	1.8	27.0	26.0
-8	5.3	0.9	2.8	3.6	5.1	2.7	26.8	25.8
-6	6.2	1.7	3.6	4.5	6.1	3.5	26.6	25.5
-4	7.2	2.5	4.6	5.5	7.1	4.4	26.4	25.3
-2	8.1	3.3	5.5	6.4	8.1	5.3	26.2	25.0
0	9.1	4.2	6.5	7.4	9.2	6.3	25.9	24.7
2	10.1	5.1	7.5	8.5	10.3	7.3	25.7	24.4
4	11.2	6.0	8.5	9.5	11.5	8.3	25.4	24.1
6	12.3	7.0	9.6	10.7	12.7	9.4	25.2	23.8
8	13.4	8.0	10.8	11.8	13.9	10.5	24.9	23.5
10	14.6	9.1	11.9	13.0	15.2	11.6	24.6	23.1
12	15.8	10.2	13.1	14.2	16.5	12.8	24.3	22.7
14	17.0	11.3	14.4	15.5	17.9	14.1	23.9	22.3
16	18.3	12.5	15.7	16.9	19.3	15.3	23.6	21.9
18	19.6	13.7	17.0	18.2	20.8	16.6	23.2	21.5
20	21.0	14.9	18.4	19.6	22.3	18.0	22.9	21.1
22	22.4	16.2	19.9	21.1	23.8	19.4	22.5	20.6
24	23.8	17.5	21.3	22.6	25.4	20.8	22.1	20.1
26	25.3	18.9	22.9	24.2	27.1	22.3	21.7	19.7
28	26.8	20.3	24.5	25.8	28.8	23.9	21.2	19.1
30	28.4	21.8	26.1	27.4	30.6	25.5	20.8	18.6
32	30.0	23.3	27.8	29.1	32.4	27.1	20.3	18.1
34	31.7	24.9	29.5	30.9	34.2	28.8	19.8	17.5
36	33.4	26.5	31.3	32.7	36.2	30.5	19.3	16.9
38	35.1	28.2	33.1	34.6	38.2	32.3	18.7	16.3
40	36.9	29.9	35.0	36.5	40.2	34.2	18.2	15.6
42	38.7	31.6	37.0	38.5	42.3	36.1	17.6	14.9
44	40.6	33.5	39.0	40.5	44.5	38.0	17.0	14.2
46	42.6	35.3	41.1	42.6	46.7	40.1	16.3	13.5
48	44.6	37.2	43.2	44.8	49.0	42.1	15.7	12.8
50	46.6	39.2	45.4	47.0	51.4	44.3	15.0	12.0
52	48.7	42.6	47.7	60.4	65.1	63.4	14.3	11.2
54	50.9	44.7	50.0	63.0	67.8	66.1	13.5	10.4
56	53.1	46.9	52.4	65.7	70.6	68.8	12.8	9.5
58	55.3	49.2	54.9	68.4	73.5	71.6	12.0	8.6
60	57.6	51.5	57.4	71.2	76.5	74.5	11.2	7.7
62	60.0	53.9	60.0	74.1	79.5	77.4	10.3	6.8
64	62.4	56.3	62.7	77.0	82.6	80.4	9.4	5.8
66	64.9	58.8	65.4	80.0	85.7	83.4	8.5	4.8
68	67.5	61.4	68.2	83.1	89.0	86.6	7.6	3.7
70	70.1	64.0	71.1	86.3	92.3	89.8	6.6	2.7
72	72.7	66.7	74.1	89.5	95.7	93.1	5.6	1.5
74	75.5	69.5	77.1	92.8	99.2	96.5	4.6	0.4
76	78.2	72.4	80.2	96.2	102.8	99.9	3.5	0.4
78	81.1	75.3	83.4	99.7	106.4	103.4	2.4	1.0
80	84.0	78.3	86.7	103.2	110.2	107.0	1.2	1.6
82	87.0	81.4	90.0	106.8	114.0	110.7	0.0	2.2
84	90.0	84.5	93.5	110.6	117.9	114.4	0.6	2.9
86	93.2	87.8	97.0	114.4	121.9	118.3	1.2	3.6
88	96.3	91.1	100.6	118.2	125.9	122.2	1.8	4.3
90	99.6	94.5	104.3	122.2	130.1	126.2	2.5	5.0
92	102.9	97.9	108.1	126.2	134.3	130.3	3.2	5.7
94	106.3	101.5	112.0	130.4	138.7	134.5	3.9	6.5
96	109.8	105.1	115.9	134.6	143.1	138.8	4.6	7.3
98	113.3	108.8	120.0	138.9	147.7	143.1	5.3	8.1
100	116.9	112.6	124.2	143.3	152.3	147.6	6.1	8.9
102	120.6	116.5	128.4	147.8	157.0	152.1	6.9	9.7
104	124.4	120.5	132.7	152.4	161.8	156.7	7.7	10.6
106	128.2	124.6	137.2	157.1	166.7	161.4	8.5	11.5
108	132.1	128.7	141.7	161.9	171.8	166.3	9.4	12.4
110	136.1	133.0	146.4	166.8	176.9	171.2	10.3	13.4
112	140.2	137.3	151.1	171.8	182.1	176.2	11.2	14.3
114	144.3	141.8	156.0	176.8	187.4	181.3	12.1	15.3
116	148.6	146.3	160.9	182.0	192.9	186.5	13.1	16.3
118	152.9	150.9	166.0	187.3	198.4	191.8	14.1	17.4
120	157.3	155.7	171.2	192.7	204.0	197.2	15.1	18.5
122	161.8	160.5	176.5	198.2	209.8	202.7	16.1	19.6
124	166.3	165.4	181.8	203.8	215.7	208.3	17.2	20.7
126	171.0	170.5	187.4	209.5	221.6	214.0	18.3	21.8
128	175.7	175.6	193.0	215.3	227.7	219.8	19.4	23.0
130	180.5	180.9	198.7	221.2	233.9	225.7	20.6	24.2
132	185.5	186.2	204.6	227.2	240.3	231.8	21.7	25.5
134	190.5	191.7	210.6	233.4	246.7	237.9	22.9	26.7
136	195.6	197.3	216.7	239.7	253.3	244.2	24.2	28.0
138	200.8	202.9	222.9	246.0	259.9	250.5	25.5	29.4
140	206.0	208.7	229.2	252.5	266.7	257.0	26.8	30.7
142	211.4	214.7	235.7	259.1	273.6	263.6	28.1	32.1
144	216.9	220.7	242.3	265.9	280.7	270.3	29.5	33.6
146	222.5	226.9	249.0	272.7	287.9	277.1	30.9	35.0
148	228.1	233.1	255.9	279.7	295.2	284.0	32.3	36.5
150	233.9	239.5	262.9	286.8	302.6	291.1	33.8	38.0

P-H Diagram – Blends (courtesy of Sporlan)



To determine superheat, use **dew point** values.
 To determine subcooling, use **bubble point** values.

Properties calculated using REFPROP Ver 8.0,
 Std Ref Data Program, NIST 2007

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