



# R-402A and R-402B

# Technical Guidelines

Physical Properties of Refrigerants	R-402A	R-402B
Environmental Classification	HCFC	HCFC
Molecular Weight	101.6	94.7
Boiling Point (1 atm, °F)	-56.5	-52.9
Critical Pressure (psia)	600	645
Critical Temperature (°F)	168	180.7
Critical Density, (lb./ft <sup>3</sup> )	33.8	33.1
Liquid Density (70 °F, lb./ft <sup>3</sup> )	72.61	72.81
Vapor Density (bp, lb./ft <sup>3</sup> )	0.356	0.328
Heat of Vaporization (bp, BTU/lb.)	83.58	90.42
Specific Heat Liquid (70 °F, BTU/lb. °F)	0.3254	0.317
Specific Heat Vapor (1 atm, 70 °F, BTU/lb. °F)	0.1811	0.1741
Ozone Depletion Potential (CFC 11 = 1.0)	0.019	0.03
Global Warming Potential (CO <sub>2</sub> = 1.0)	2788	2416
ASHRAE Standard 34 Safety Rating	A1	A1
Temperature Glide (°F) (see section2)	2.5	2.5

Available in the following sizes

R-402A  
27 LB. CYLINDER  
110 LB. CYLINDER

R-402B  
13 LB. CYLINDER

### Pressure-Temp Chart

R-402A (psig)	Temp (°F)	R-402B (psig)
6.3	-40	3.6
9.1	-35	6.0
12.1	-30	9.0
15.4	-25	12.0
18.9	-20	15.4
22.9	-15	18.6
27.1	-10	22.6
31.7	-5	27.0
36.7	0	31.0
42.1	5	36.0
48.0	10	42.0
54.2	15	47.0
60.9	20	54.0
68.1	25	60.0
75.8	30	67.0
84.0	35	75.0
92.8	40	83.4
102	45	91.6
112	50	100
123	55	110
134	60	120
146	65	133
158	70	143
171	75	155
185	80	170
200	85	183
215	90	198
232	95	213
249	100	230
267	105	247
286	110	262
305	115	283
326	120	303
347	125	323
370	130	345
393	135	-
418	140	-
443	145	-
470	150	-

## R-402A

(R-125/290/22)  
(60 / 2 / 38 wt%)

Replaces: R-502

Applications: Low temperature commercial and industrial direct expansion refrigeration

Performance: Lower discharge temperature, Higher discharge pressure

### Lubricant

Recommendation: Compatible with mineral and alkylbenzene oil. If oil return becomes a concern, addition of polyolester lubricant in 5% increments could help resolve the issue.

## R-402B

(R-125/290/22)  
(38 / 2 / 60 wt%)

Replaces: R-502

Applications: Ice machines

Performance: Higher discharge temperature, Lower discharge pressure

### Lubricant

Recommendation: Compatible with mineral and alkylbenzene oil. If oil return becomes a concern, addition of polyolester lubricant in 5% increments could help resolve the issue.

Retrofitting: Replacement for R-502 page 98  
to R422C page 100



THERMODYNAMIC PROPERTIES OF R-402A

Temp [°F]	Pressure Liquid [psia]	Pressure Vapor [psia]	Density Liquid [lb/ft <sup>3</sup> ]	Density Vapor [lb/ft <sup>3</sup> ]	Enthalpy Liquid [Btu/lb]	Enthalpy Vapor [Btu/lb]	Entropy Liquid [Btu/R-lb]	Entropy Vapor [Btu/R-lb]
-60	13.4	12.0	89.70	0.2946	-5.410	78.16	-0.01316	0.1968
-55	15.3	13.8	89.14	0.3355	-4.067	78.80	-0.00983	0.1958
-50	17.4	15.8	88.58	0.3807	-2.718	79.45	-0.00653	0.1948
-45	19.8	18.0	88.01	0.4305	-1.362	80.09	-0.00325	0.1939
-40	22.3	20.5	87.44	0.4854	0.000	80.73	0.00000	0.1931
-35	25.2	23.2	86.86	0.5455	1.369	81.37	0.00323	0.1923
-30	28.3	26.1	86.28	0.6113	2.746	82.00	0.00644	0.1915
-25	31.7	29.4	85.69	0.6832	4.130	82.62	0.00962	0.1908
-20	35.4	32.9	85.09	0.7615	5.522	83.24	0.01279	0.1901
-15	39.4	36.8	84.48	0.8467	6.923	83.85	0.01594	0.1895
-10	43.8	41.0	83.87	0.9392	8.331	84.46	0.01906	0.1889
-5	48.6	45.6	83.25	1.039	9.749	85.06	0.02218	0.1883
0	53.7	50.6	82.62	1.148	11.18	85.65	0.02527	0.1878
5	59.2	56.0	81.99	1.265	12.61	86.23	0.02835	0.1873
10	65.2	61.7	81.34	1.392	14.06	86.81	0.03142	0.1868
15	71.6	68.0	80.68	1.528	15.52	87.37	0.03448	0.1863
20	78.4	74.7	80.02	1.675	16.98	87.93	0.03752	0.1858
25	85.8	81.8	79.34	1.834	18.46	88.48	0.04055	0.1854
30	93.6	89.5	78.65	2.004	19.95	89.01	0.04357	0.1850
35	102.0	97.7	77.95	2.187	21.46	89.53	0.04659	0.1846
40	110.9	106.4	77.24	2.383	22.97	90.05	0.04959	0.1842
45	120.3	115.8	76.51	2.595	24.50	90.54	0.05259	0.1838
50	130.4	125.7	75.76	2.821	26.04	91.02	0.05559	0.1834
55	141.1	136.2	75.00	3.065	27.60	91.49	0.05858	0.1830
60	152.4	147.4	74.23	3.326	29.18	91.94	0.06157	0.1826
65	164.4	159.2	73.43	3.607	30.77	92.37	0.06456	0.1822
70	177.1	171.8	72.61	3.909	32.38	92.78	0.06755	0.1818
75	190.5	185.0	71.78	4.233	34.00	93.17	0.07054	0.1814
80	204.6	199.0	70.91	4.583	35.65	93.54	0.07354	0.1810
85	219.5	213.8	70.02	4.959	37.32	93.88	0.07654	0.1806
90	235.1	229.3	69.10	5.366	39.01	94.19	0.07956	0.1801
95	251.6	245.7	68.15	5.805	40.73	94.47	0.08259	0.1797
100	269.0	263.0	67.17	6.281	42.48	94.71	0.08564	0.1791
105	287.2	281.1	66.14	6.799	44.25	94.91	0.08871	0.1786
110	306.3	300.2	65.06	7.362	46.07	95.07	0.09181	0.1780
115	326.4	320.2	63.93	7.979	47.92	95.18	0.09494	0.1773
120	347.4	341.3	62.74	8.658	49.81	95.22	0.09812	0.1766
125	369.5	363.3	61.48	9.408	51.76	95.20	0.1013	0.1758
130	392.6	386.5	60.13	10.25	53.76	95.09	0.1046	0.1748
135	416.9	410.8	58.67	11.19	55.84	94.88	0.1080	0.1738
140	442.2	436.3	57.07	12.26	58.01	94.55	0.1115	0.1725