R-500 and R-502

R-500

Composition: (R-12 / 152a) • (73.8 / 26.2 wt%))

Application:
Air conditioning, dehumidifiers and centrifugal chillers

Lubricant:
Mineral oil and alkylbenzene

Retrofitting:
- Consult the comments on Pages 9 and 10
- See Section II, pages 92-98 for detailed discussion

R-502

Composition: (R-22 / 115) • (48.8 / 51.2wt%)

Application: Low temperature commercial and industrial refrigeration and ice machines

Lubricant:
Mineral oil and alkylbenzene

Retrofitting:
- Consult the comments on Pages 9 and 10
- See Section II, pages 92-98 for detailed discussion

[PHYSICAL PROPERTIES OF REFRIGERANTS]	National R-500	National R-502
Environmental Classification	CFC	CFC
Molecular Weight	99.3	111.6
Boiling Point (1atm, ˚F)	-28.5	-49.5
Critical Pressure (psia)	605.2	582.8
Critical Temperature (˚F)	215.8	177.3
Critical Density (lb./ft^3)	30.7	35.5
Liquid Density (70˚F, lb./ft^3)	73	77
Vapor Density (bp.lb./ft^3)	0.329	0.388
Heat of Vaporization (bp, BTU/lb.)	86.4	74.2
Specific Heat Liquid (70 ˚F, BTU/lb.˚F)	0.2782	0.2958
Specific Heat Vapor (1atm, 70 ˚F, BTU/lb.˚F)	0.1725	0.1641
Ozone Depletion Potential (CFC 11 = 1.0)	0.66	0.23
Global Warming Potential (CO_2 = 1.0)	8077	4657
ASHRAE Standard 34 Safety Rating	A1	A1

[PRESSURE-TEMP CHART]

R-500 psig	TEMP. (˚F)	R-502 psig
7.6"	**-40**	4.1
4.6"	**-35**	6.5
1.2"	**-30**	9.2
1.2	**-25**	12.1
3.2	**-20**	15.3
5.4	**-15**	18.8
7.8	**-10**	22.6
10.4	**-5**	26.7
13.3	**0**	31.1
16.4	**5**	35.9
19.7	**10**	41.0
23.4	**15**	46.5
27.3	**20**	52.4
31.5	**25**	58.8
36.0	**30**	65.6
40.9	**35**	72.8
46.1	**40**	80.5
51.6	**45**	88.7
57.6	**50**	97.4
63.9	**55**	107
70.6	**60**	116
77.8	**65**	127
85.4	**70**	138
93.5	**75**	149
102	**80**	161
111	**85**	174
121	**90**	187
131	**95**	201
141	**100**	216
152	**105**	232
164	**110**	248
177	**115**	265
189	**120**	283
203	**125**	301
217	**130**	321
232	**135**	341
248	**140**	363

[AVAILABLE IN SIZES]

REFRIGERANT	Type	Size
R-500	Cylinder	30 lb.
		125 lb.
R-502	Cylinder	30 lb.
		125 lb.

Thermodynamic Properties of R-500

TEMP. (˚F)	Pressure Liquid (psia)	Pressure Vapor (psia)	Density Liquid (lb/ft^3)	Density Vapor (lb/ft^3)	Enthalpy Liquid (Btu/lb)	Enthalpy Vapor (Btu/lb)	Entropy Liquid (Btu/R-lb)	Entropy Vapor (Btu/R-lb)
-60	6.3	6.3	85.26	0.1498	-5.016	85.98	-0.01222	0.2155
-55	7.3	7.3	84.81	0.1713	-3.770	86.63	-0.00913	0.2143
-50	8.4	8.4	84.35	0.1951	-2.519	87.27	-0.00606	0.2131
-45	9.6	9.6	83.89	0.2215	-1.262	87.92	-0.00302	0.2120
-40	11.0	11.0	83.43	0.2506	0.000	88.56	0.00000	0.2110
-35	12.5	12.5	82.97	0.2826	1.268	89.20	0.00299	0.2100
-30	14.2	14.2	82.50	0.3177	2.541	89.83	0.00597	0.2091
-25	16.0	16.0	82.03	0.3561	3.820	90.47	0.00892	0.2083
-20	18.0	18.0	81.55	0.3980	5.106	91.10	0.01185	0.2074
-15	20.2	20.2	81.07	0.4436	6.397	91.73	0.01476	0.2066
-10	22.6	22.6	80.59	0.4932	7.695	92.35	0.01765	0.2059
-5	25.3	25.3	80.10	0.5470	9.000	92.97	0.02052	0.2052
0	28.1	28.1	79.61	0.6053	10.31	93.58	0.02337	0.2045
5	31.3	31.2	79.11	0.6682	11.63	94.19	0.02621	0.2039
10	34.6	34.6	78.61	0.7362	12.96	94.80	0.02903	0.2033
15	38.3	38.2	78.10	0.8095	14.29	95.40	0.03184	0.2027
20	42.2	42.1	77.59	0.8883	15.63	95.99	0.03463	0.2022
25	46.4	46.4	77.07	0.9730	16.98	96.58	0.03741	0.2016
30	50.9	50.9	76.55	1.064	18.34	97.16	0.04017	0.2011
35	55.8	55.7	76.01	1.161	19.70	97.73	0.04292	0.2007
40	61.0	60.9	75.48	1.266	21.08	98.29	0.04566	0.2002
45	66.6	66.5	74.93	1.378	22.46	98.85	0.04838	0.1998
50	72.5	72.4	74.38	1.497	23.85	99.40	0.05110	0.1993
55	78.9	78.7	73.82	1.625	25.25	99.94	0.05381	0.1989
60	85.6	85.4	73.25	1.761	26.66	100.5	0.05650	0.1985
65	92.8	92.5	72.67	1.907	28.09	101.0	0.05919	0.1982
70	100.4	100.1	72.08	2.062	29.52	101.5	0.06187	0.1978
75	108.4	108.1	71.48	2.228	30.96	102.0	0.06455	0.1974
80	116.9	116.6	70.87	2.405	32.42	102.5	0.06722	0.1970
85	125.9	125.5	70.25	2.593	33.89	102.9	0.06988	0.1967
90	135.4	135.0	69.62	2.794	35.37	103.4	0.07254	0.1963
95	145.5	145.0	68.98	3.008	36.86	103.8	0.07520	0.1960
100	156.1	155.5	68.32	3.236	38.37	104.3	0.07785	0.1956
105	167.2	166.6	67.64	3.479	39.89	104.7	0.08051	0.1952
110	178.9	178.2	66.95	3.739	41.43	105.0	0.08316	0.1949
115	191.2	190.4	66.25	4.016	42.99	105.4	0.08582	0.1945
120	204.1	203.3	65.52	4.313	44.56	105.8	0.08849	0.1941
125	217.7	216.8	64.77	4.630	46.15	106.1	0.09115	0.1937
130	231.9	230.9	64.00	4.970	47.77	106.4	0.09383	0.1933
135	246.8	245.7	63.21	5.335	49.40	106.6	0.09652	0.1928
140	262.4	261.2	62.39	5.726	51.06	106.9	0.09922	0.1923
145	278.7	277.4	61.54	6.148	52.74	107.1	0.1019	0.1918
150	295.7	294.4	60.66	6.604	54.45	107.2	0.1047	0.1913
155	313.6	312.1	59.73	7.097	56.20	107.3	0.1074	0.1907