R-422B and R-422D

R-422B
R-422D

Composition:
R-422B: (R-125 / 134a / 600a) • (55 / 42 / 3 wt%)
R-422D: (R-125 / 134a / 600a) • (65.1 / 31.5 / 3.4 wt%)

Replaces: R-22

Application:
R-422B: Medium temperature commercial and industrial refrigeration and air conditioning
R-422D: Medium and low temperature commercial and industrial refrigeration and air conditioning

Performance:
- **R-422B:** Best match at warmer evaporator temps / AC
- **R-422D:** Best match at medium temp evaporator / refrigeration
- Lower discharge temperature
- Possible undersized TXV or distributor nozzle based on pressure drop
- Up to 10% lower capacity at lower evaporator temperatures

Lubricant:
Polyolester lubricant; a hydrocarbon additive is designed to circulate mineral oil or alkylbenzene, but addition of POE may be required if there is a problem with circulation.

Retrofitting:
- Consult the comments on Pages 9 and 10
- See Section II, pages 92-96 for detailed discussion

[PHYSICAL PROPERTIES OF REFRIGERANTS]	National R-422B	National R-422D
Environmental Classification	HFC	HFC
Molecular Weight	108.5	109.9
Boiling Point (1atm, ˚F)	-42.4	-45.8
Critical Pressure (psia)	574.1	566.2
Critical Temperature (˚F)	181.8	175.2
Critical Density (lb./ft^3)	32.9	33.0
Liquid Density (70˚F, lb./ft^3)	73.05	70.9
Vapor Density (bp.lb./ft^3)	0.363	0.372
Heat of Vaporization (bp, BTU/lb.)	84.2	81.8
Specific Heat Liquid (70 ˚F, BTU/lb. ˚F)	0.3385	0.339
Specific Heat Vapor (1atm, 70 ˚F, BTU/lb. ˚F)	0.201	0.20
Ozone Depletion Potential (CFC 11 = 1.0)	0	0
Global Warming Potential (CO2 = 1.0)	2525	2730
ASHRAE Standard 34 Safety Rating	A1	A1
Temperature Glide (˚F) (see section 2)	5	5

[PRESSURE-TEMP CHART]

R422B Liquid (psig)	R422B Vapor (psig)	TEMP. (˚F)	R422D Liquid (psig)	R422D Vapor (psig)
0.9	*2.7″*	**-40**	2.4	*2.3″*
3.0	*0.9″*	**-35**	4.6	0.8
5.4	1.1	**-30**	7.1	3.0
7.9	3.2	**-25**	9.9	5.4
10.7	5.7	**-20**	12.9	8.1
13.8	8.3	**-15**	16.2	11.0
17.1	11.3	**-10**	19.8	14.3
20.7	14.5	**-5**	23.7	17.8
24.7	18.0	**0**	27.9	21.7
29.0	21.9	**5**	32.5	25.8
33.6	26.1	**10**	37.5	30.4
38.6	30.6	**15**	42.8	35.3
43.9	35.5	**20**	48.5	40.7
49.7	40.8	**25**	54.7	46.4
55.9	46.6	**30**	61.3	52.6
62.5	52.7	**35**	68.4	59.3
69.6	59.4	**40**	75.9	66.4
77.2	66.5	**45**	84.0	74.0
85.3	74.1	**50**	92.6	82.2
94	82.2	**55**	102	90.9
103	90.9	**60**	111	100
113	100	**65**	122	110
123	110	**70**	133	121
134	120	**75**	144	132
145	132	**80**	156	144
158	143	**85**	169	156
170	156	**90**	183	170
184	169	**95**	197	184
198	183	**100**	212	198
213	198	**105**	228	214
229	213	**110**	245	231
246	230	**115**	262	248
263	247	**120**	281	266
281	265	**125**	300	286
301	284	**130**	320	306
321	304	**135**	341	327
342	326	**140**	364	350

[AVAILABLE IN SIZES]

REFRIGERANT	Type	Size
R-422B	Cylinder	25 lb.
		110 lb.
R-422D	Cylinder	25 lb.
		110 lb.

Thermodynamic Properties of R-422B

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	9.1	6.6	89.17	0.17	-5.810	79.45	-0.01415	0.2022
-55	10.5	7.7	88.63	0.20	-4.366	80.19	-0.01057	0.2013
-50	12.0	9.0	88.09	0.23	-2.916	80.94	-0.00701	0.2004
-45	13.7	10.4	87.54	0.26	-1.461	81.68	-0.00349	0.1996
-40	15.6	12.0	86.99	0.30	0.000	82.42	0.00000	0.1989
-35	17.7	13.8	86.44	0.34	1.467	83.16	0.00346	0.1982
-30	20.0	15.7	85.88	0.39	2.941	83.89	0.00690	0.1976
-25	22.6	17.9	85.32	0.44	4.421	84.63	0.01031	0.1970
-20	25.4	20.4	84.75	0.49	5.908	85.35	0.01370	0.1964
-15	28.5	23.0	84.17	0.56	7.402	86.08	0.01707	0.1959
-10	31.8	26.0	83.59	0.62	8.904	86.80	0.02041	0.1955
-5	35.4	29.2	83.00	0.70	10.41	87.51	0.02373	0.1951
0	39.4	32.7	82.41	0.78	11.93	88.22	0.02703	0.1947
5	43.7	36.6	81.81	0.86	13.46	88.92	0.03031	0.1943
10	48.3	40.8	81.20	0.96	14.99	89.62	0.03358	0.1940
15	53.3	45.3	80.58	1.06	16.54	90.31	0.03682	0.1937
20	58.6	50.2	79.95	1.17	18.09	90.99	0.04006	0.1934
25	64.4	55.5	79.32	1.29	19.66	91.66	0.04327	0.1931
30	70.6	61.3	78.67	1.42	21.23	92.33	0.04648	0.1929
35	77.2	67.4	78.01	1.57	22.82	92.99	0.04967	0.1927
40	84.3	74.1	77.35	1.72	24.42	93.63	0.05285	0.1925
45	91.9	81.2	76.67	1.88	26.03	94.26	0.05601	0.1923
50	100	88.8	75.97	2.06	27.65	94.89	0.05917	0.1921
55	109	96.9	75.27	2.25	29.28	95.50	0.06233	0.1919
60	118	106	74.55	2.45	30.93	96.09	0.06547	0.1918
65	127	115	73.81	2.68	32.60	96.67	0.06861	0.1916
70	138	125	73.05	2.91	34.28	97.23	0.07175	0.1914
75	149	135	72.28	3.17	35.97	97.78	0.07489	0.1912
80	160	146	71.49	3.45	37.69	98.30	0.07802	0.1911
85	172	158	70.67	3.74	39.42	98.81	0.08116	0.1909
90	185	170	69.83	4.06	41.17	99.29	0.08430	0.1907
95	199	184	68.96	4.41	42.95	99.74	0.08745	0.1904
100	213	198	68.07	4.78	44.74	100.2	0.09060	0.1902
105	228	212	67.14	5.19	46.57	100.6	0.09377	0.1899
110	244	228	66.18	5.63	48.42	100.9	0.09696	0.1896
115	260	244	65.17	6.11	50.30	101.2	0.1002	0.1893
120	278	262	64.13	6.63	52.21	101.5	0.1034	0.1889
125	296	280	63.03	7.21	54.16	101.8	0.1067	0.1885
130	315	299	61.87	7.83	56.15	101.9	0.1100	0.1879
135	335	319	60.64	8.53	58.20	102.0	0.1133	0.1874
140	357	340	59.32	9.31	60.29	102.1	0.1167	0.1867