



# R-123 and R-124

## R-123

**Composition:** 100% 2,2-dichloro 1,1,1-trifluoroethane (CF<sub>3</sub>CHCl<sub>2</sub>)

**Application:** Large, low pressure centrifugal chillers

**Performance:**

May require replacement of seals, gaskets, and other components to obtain the correct operating conditions and prevent leakage

**Lubricant:**

Compatible with mineral oil and alkylbenzene

**Retrofitting:**

- Consult equipment manufacturer to retrofit R-11 chiller to R-123

## R-124

**Composition:** 100% 2-chloro 1,1,1,2-tetrafluoroethane (CF<sub>3</sub>CHClF)

**Application:** High ambient air conditioning

**Performance:**

Slightly higher pressures and slightly lower capacity when used in an R-114 system

**Lubricant:**

Compatible with mineral oil and alkylbenzene

**Retrofitting:**

- for R-114 (Consult equipment manufacturer's guidelines)

[ PRESSURE-TEMP CHART ]

R-123 psig	TEMP. (°F)	R-124 psig
27.8"	-20	16.1"
27.4"	-15	14.1"
26.9"	-10	12.0"
26.4"	-5	9.6"
25.9"	0	6.9"
25.2"	5	3.9"
24.5"	10	0.6"
23.8"	15	1.6
22.8"	20	3.5
21.8"	25	5.7
20.7"	30	8.1
19.5"	35	10.5
18.1"	40	13.2
16.6"	45	16.1
14.9"	50	19.2
13.0"	55	22.6
11.2"	60	26.3
8.9"	65	30.2
6.5"	70	34.4
4.1"	75	38.9
1.2"	80	43.7
0.9	85	48.8
2.5	90	54.2
4.3	95	60.0
6.1	100	66.1
8.1	105	72.6
10.3	110	79.5
12.6	115	86.8
15.1	120	94.5
17.8	125	103
20.6	130	111
23.6	135	120
26.8	140	130
30.2	145	140
33.9	150	150

[ PHYSICAL PROPERTIES OF REFRIGERANTS ]

	National R-123	National R-124
Environmental Classification	HCFC	HCFC
Molecular Weight	152.9	136.5
Boiling Point (1atm, °F)	82.1	10.3
Critical Pressure (psia)	531.1	527.1
Critical Temperature (°F)	362.6	252.5
Critical Density (lb./ft <sup>3</sup> )	34.3	34.6
Liquid Density (70 °F, lb./ft <sup>3</sup> )	91.95	85.5
Vapor Density (bp, lb./ft <sup>3</sup> )	0.404	0.419
Heat of Vaporization (bp, BTU/lb.)	73.2	70.6
Specific Heat Liquid (70 °F, BTU/lb. °F)	0.2329	0.265
Specific Heat Vapor (1atm, 70 °F, BTU/lb. °F)	0.1645(sat)	0.1762
Ozone Depletion Potential (CFC 11 = 1.0)	0.0015	0.03
Global Warming Potential (CO <sub>2</sub> = 1.0)	77	609
ASHRAE Standard 34 Safety Rating	B1	A1

[ AVAILABLE IN SIZES ]

REFRIGERANT	Type	Size
R-123	Drum	100 lb.
		200 lb.
		650 lb.
R-124	Cylinder	30 lb.
	Cylinder	145 lb.



# Thermodynamic Properties of R-124

TEMP. (°F)	Pressure Liquid (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)
-40	3.8	97.03	0.1181	0	76.75	0	0.1829
-35	4.5	96.55	0.1359	1.222	77.46	0.00289	0.1824
-30	5.2	96.06	0.1557	2.449	78.17	0.00576	0.1820
-25	5.9	95.57	0.1779	3.681	78.88	0.00861	0.1816
-20	6.8	95.08	0.2024	4.918	79.59	0.01143	0.1813
-15	7.8	94.58	0.2295	6.159	80.30	0.01424	0.1810
-10	8.9	94.08	0.2594	7.406	81.01	0.01702	0.1807
-5	10.1	93.57	0.2924	8.657	81.72	0.01978	0.1805
0	11.4	93.06	0.3285	9.914	82.43	0.02253	0.1803
5	12.9	92.55	0.3680	11.18	83.14	0.02525	0.1801
10	14.5	92.04	0.4112	12.44	83.84	0.02796	0.1800
15	16.3	91.52	0.4583	13.72	84.55	0.03065	0.1799
20	18.3	90.99	0.5095	15.00	85.25	0.03332	0.1798
25	20.4	90.46	0.5651	16.28	85.95	0.03597	0.0797
30	22.7	89.93	0.6253	17.57	86.65	0.03861	0.1797
35	25.2	89.39	0.6904	18.87	87.35	0.04124	0.1797
40	27.9	88.84	0.7608	20.17	88.05	0.04385	0.1797
45	30.8	88.29	0.8366	21.48	88.74	0.04644	0.1797
50	34.0	87.73	0.9183	22.80	89.43	0.04902	0.1798
55	37.4	87.17	1.006	24.12	90.11	0.05159	0.1798
60	41.0	86.60	1.100	25.45	90.79	0.05415	0.1799
65	44.9	86.03	1.202	26.79	91.47	0.05669	0.1800
70	49.1	85.44	1.310	28.13	92.14	0.05922	0.1801
75	53.6	84.85	1.426	29.48	92.81	0.06174	0.1802
80	58.4	84.25	1.551	30.84	93.47	0.06425	0.1803
85	63.5	83.65	1.683	32.21	94.13	0.06676	0.1804
90	69.0	83.03	1.825	33.58	94.78	0.06925	0.1806
95	74.8	82.41	1.977	34.97	95.42	0.07173	0.1807
100	80.9	81.77	2.139	36.36	96.06	0.07420	0.1809
105	87.4	81.13	2.311	37.76	96.69	0.07667	0.1810
110	94.3	80.48	2.495	39.17	97.31	0.07913	0.1812
115	101.6	79.81	2.691	40.59	97.92	0.08158	0.1813
120	109.3	79.13	2.900	42.02	98.53	0.08403	0.1815
125	117.5	78.44	3.123	43.46	99.12	0.08648	0.1817
130	126.0	77.73	3.360	44.92	99.70	0.08892	0.1818
135	135.1	77.01	3.614	46.38	100.3	0.09135	0.1820
140	144.6	76.28	3.884	47.86	100.8	0.09379	0.1821
145	154.6	75.52	4.172	49.35	101.4	0.09622	0.1823
150	165.1	74.75	4.480	50.85	101.9	0.09866	0.1824
155	176.2	73.96	4.809	52.37	102.4	0.1011	0.1825
160	187.7	73.14	5.161	53.91	102.9	0.1035	0.1826
165	199.9	72.30	5.538	55.46	103.4	0.1060	0.1827
170	212.6	71.44	5.942	57.03	103.8	0.1084	0.1828
175	225.9	70.54	6.377	58.62	104.3	0.1109	0.1828
180	239.8	69.61	6.845	60.23	104.7	0.1134	0.1828