

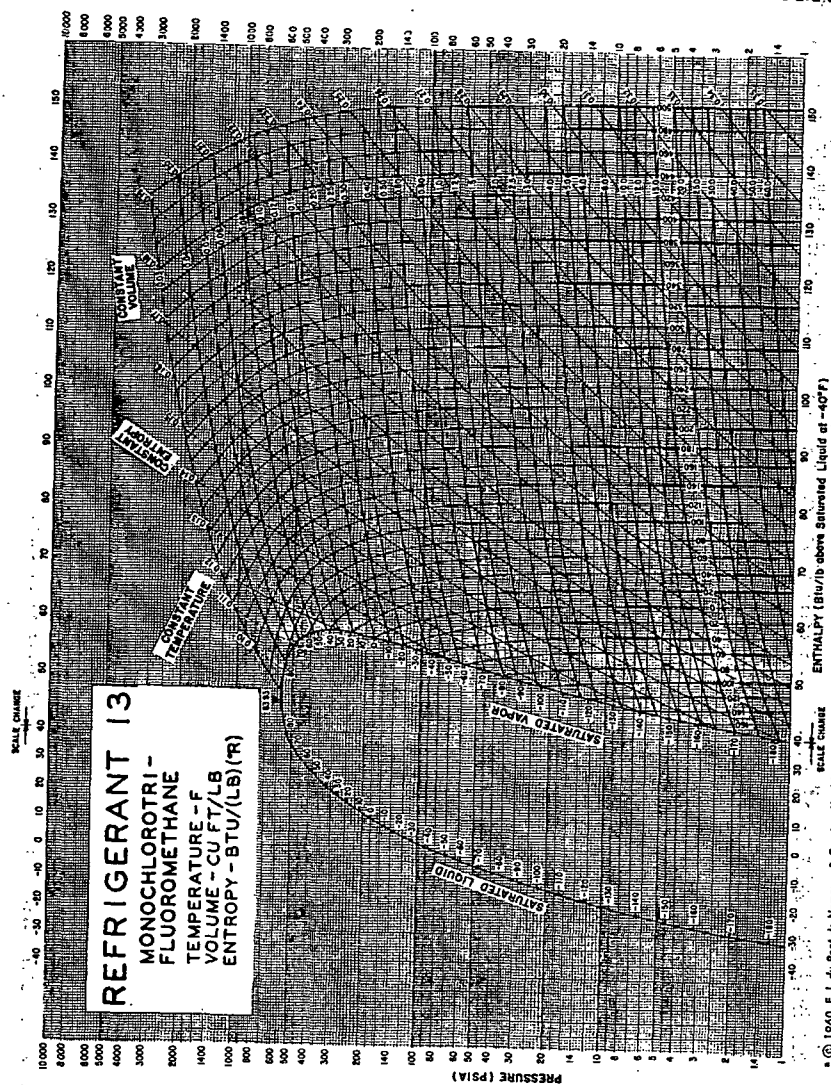


Fig. 3 Pressure-Enthalpy Diagram for Refrigerant 13

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Refrigerant Tables and Charts.

Table 5 Refrigerant 13 (Monochlorotrifluoromethane) Properties of Liquid and Saturated Vapor*

Temp F	Pressure		Volume cu ft/lb	Density lb/cu ft	Enthalpy** Btu/lb		Entropy** Btu/(lb) (°R)		Temp F	Pressure		Volume cu ft/lb	Density lb/cu ft	Enthalpy** Btu/lb		Entropy** Btu/(lb) (°R)	
	psia	psig	Vapor v _g	Liquid l _f	Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g		psia	psig	Vapor v _g	Liquid l _f	Liquid h _f	Vapor h _g	Liquid s _f	Vapor s _g
-200	0.4320	29.04*	51.33	105.6	-34.551	38.548	-0.10081	0.18066	-20	128.4	111.7	0.2920	80.71	4.809	55.477	0.01060	0.12620
-190	0.7490	28.40*	38.74	104.4	-32.429	39.630	-0.09318	0.17035	-10	130.1	135.4	0.2494	78.86	4.854	56.114	0.01026	0.12550
-180	1.238	27.40*	27.99	103.2	-30.295	40.672	-0.08515	0.16000	0	126.8	162.1	0.2066	76.98	10.052	56.890	0.02234	0.12320
-170	1.967	25.92*	14.943	102.0	-28.208	41.696	-0.07826	0.15073	10	306.8	192.1	0.1743	74.91	12.696	57.175	0.07780	0.12350
-160	2.104	25.60*	9.750	100.8	-26.058	42.724	-0.07219	0.14147	20	340.4	225.7	0.1472	72.73	15.443	57.663	0.03311	0.12128
-150	4.464	20.53*	6.978	96.00	-24.010	43.773	-0.06691	0.13296	30	277.9	263.2	0.12437	70.32	18.247	57.719	0.03921	0.11928
-140	6.455	18.78*	4.930	88.38	-21.929	44.794	-0.06444	0.12519	40	319.6	304.9	0.10453	67.70	21.270	57.820	0.04510	0.11811
-130	9.080	11.43*	3.693	86.09	-19.792	45.804	-0.06309	0.11857	50	342.2	327.5	0.09565	66.27	22.979	57.748	0.04826	0.11715
-120	12.48	4.61*	2.681	85.69	-17.671	46.802	-0.06460	0.11290	60	363.9	351.2	0.08734	64.68	24.651	57.699	0.05147	0.11609
-110	16.81	5.11	2.031	84.34	-15.527	47.789	-0.05977	0.11129	70	390.8	376.1	0.07945	62.97	26.418	57.584	0.05478	0.11486
-100	22.23	7.53	1.6642	83.02	-13.387	48.761	-0.05390	0.13889	80	417.0	402.3	0.07180	61.09	28.310	56.987	0.05820	0.11343
-90	28.89	14.19	1.2322	81.66	-11.241	49.700	-0.04806	0.13878	90	444.5	429.8	0.06463	59.06	30.322	56.459	0.06193	0.11174
-80	36.98	22.28	0.9659	80.17	-9.032	50.620	-0.04230	0.13486	100	473.4	458.7	0.05787	56.98	32.418	55.708	0.06591	0.10970
-70	46.68	31.98	0.7708	78.73	-6.843	51.519	-0.03651	0.13113	110	503.7	489.0	0.05097	54.85	35.110	54.492	0.07029	0.10654
-60	58.19	43.49	0.6289	77.26	-4.604	52.389	-0.03106	0.13153	120	535.5	520.8	0.04381	52.65	38.527	53.092	0.07672	0.10185
-50	71.71	57.01	0.5139	85.69	-2.320	53.226	-0.02548	0.13009	130	561.3	546.8	0.02772	50.38	45.271	51.038	0.08380	0.09593
-40	87.43	72.73	0.4234	84.10	0.000	54.023	-0.02000	0.12872									
-30	105.6	90.90	0.3512	82.44	2.363	54.416	-0.01544	0.12744									

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 ** Inches of mercury below one atmosphere.
 * Based on 0 for the saturated liquid at -40 F.

Table 6 Refrigerant 13 (Monochlorotrifluoromethane) Properties of Superheated Vapor*

Temp F	Abs Pressure 1 psi Gage Press. 27.88 in. Vac (Sat Temp -184.37 F)			Abs Pressure 1.5 psi Gage Press. 26.87 in. Vac (Sat Temp -175.96 F)			Abs Pressure 2 psi Gage Press. 25.85 in. Vac (Sat Temp -169.62 F)			Abs Pressure 2.5 psi Gage Press. 24.83 in. Vac (Sat Temp -164.47 F)			Abs Pressure 3 psi Gage Press. 23.81 in. Vac (Sat Temp -160.11 F)		
	v	h	s	v	h	s	v	h	s	v	h	s	v	h	s
(At Sat)	(28.05)	(40.23)	(0.1705)	(19.22)	(41.18)	(0.1658)	(14.70)	(41.80)	(0.1625)	(11.95)	(42.30)	(0.1601)	(0.0888)	(42.78)	(0.1581)
-180	78.51	40.70	0.1722	30.55	42.93	0.1719	15.22	42.58	0.1681	12.14	42.81	0.1618	10.09	43.74	0.1581
-170	30.61	43.02	0.1797	21.75	45.33	0.1793	10.29	45.28	0.1736	13.00	45.22	0.1693	10.82	45.17	0.1656
-160	37.71	45.08	0.1877	23.15	47.33	0.1873	10.29	47.28	0.1807	13.85	47.66	0.1764	11.52	47.02	0.1728
-150	34.78	47.80	0.1940	23.15	49.33	0.1940	10.29	49.28	0.1873	14.69	50.15	0.1834	12.22	50.12	0.1799
-140	36.85	50.28	0.2011	24.54	50.22	0.2033	18.38	50.19	0.1876	14.69	50.15	0.1834	12.22	50.12	0.1799
-130	38.93	52.78	0.2078	25.53	52.78	0.2090	19.42	52.72	0.1944	15.32	52.69	0.1905	12.92	52.66	0.1868
-120	40.98	55.28	0.2143	27.31	55.33	0.2165	20.46	55.31	0.2010	16.35	55.28	0.1968	13.91	55.26	0.1933
-110	43.05	58.00	0.2207	28.68	57.98	0.2230	21.49	57.96	0.2076	17.18	57.93	0.2032	14.31	57.91	0.1997
-100	45.11	60.71	0.2270	30.06	60.69	0.2292	22.53	60.67	0.2139	18.00	60.63	0.2095	15.00	60.63	0.2060
0	47.16	63.48	0.2331	31.43	63.47	0.2353	23.56	63.45	0.2200	18.84	63.43	0.2158	15.69	63.42	0.2121
10	49.22	66.33	0.2392	32.81	66.32	0.2415	24.59	66.30	0.2261	19.68	66.28	0.2217	16.37	66.27	0.2182
20	51.28	69.24	0.2449	34.18	69.23	0.2475	25.61	69.21	0.2320	20.49	69.20	0.2277	17.07	69.19	0.2243
30	53.35	72.22	0.2510	35.54	72.21	0.2540	26.65	72.19	0.2375	21.31	72.18	0.2332	17.75	72.17	0.2303
40	55.40	75.28	0.2569	36.91	75.25	0.2597	27.68	75.24	0.2430	22.14	75.23	0.2389	18.44	75.22	0.2360
100	67.48	78.36	0.2634	38.29	78.35	0.2667	28.71	78.34	0.2492	22.96	78.33	0.2450	19.13	78.33	0.2414
120	69.50	81.63	0.2680	39.66	81.62	0.2723	29.74	81.61	0.2548	23.79	81.60	0.2504	19.82	81.60	0.2471
140	71.56	84.76	0.2734	41.03	84.75	0.2777	30.77	84.74	0.2602	24.62	84.73	0.2560	20.50	84.72	0.2528
160	73.62	88.04	0.2788	42.40	88.03	0.2830	31.79	88.02	0.2657	25.44	88.01	0.2614	21.19	88.01	0.2579
180	75.67	91.37	0.2843	43.77	91.36	0.2884	32.82	91.35	0.2711	26.26	91.34	0.2668	21.88	91.33	0.2631
Temp F	Abs Pressure 4 psi Gage Press. 21.76 in. Vac (Sat Temp -152.91 F)			Abs Pressure 6 psi Gage Press. 17.70 in. Vac (Sat Temp -142.06 F)			Abs Pressure 8 psi Gage Press. 13.63 in. Vac (Sat Temp -133.80 F)			Abs Pressure 10 psi Gage Press. 9.55 in. Vac (Sat Temp -127.04 F)			Abs Pressure 15 psi Gage Press. 0.3 in. Vac (Sat Temp -113.92 F)		
	v	h	s	v	h	s	v	h	s	v	h	s	v	h	s
(At Sat)	(7.722)	(43.50)	(0.1550)	(5.295)	(44.57)	(0.1509)	(4.055)	(45.47)	(0.1481)	(3.296)	(46.12)	(0.1459)	(2.591)	(47.45)	(0.1433)
-120	9.077	45.07	0.1590	6.538	46.94	0.1517	4.251	47.20	0.1533	3.376	47.02	0.1486	2.688	48.29	0.1475
-100	9.149	50.05	0.1742	6.069	49.91	0.1602	4.528	49.78	0.1605	3.602	49.64	0.1560	2.968	49.29	0.1547
-80	9.871	55.01	0.1810	6.421	52.50	0.1732	4.795	52.38	0.1744	3.819	52.27	0.1628	3.218	51.98	0.1617
-60	10.19	59.99	0.1877	6.778	55.12	0.1860	5.063	55.00	0.1856	4.034	54.93	0.1694	3.468	54.69	0.1686
-40	10.72	64.98	0.1942	7.124	57.80	0.1984	5.328	57.72	0.1987	4.245	57.64	0.1762	3.718	57.43	0.1753
0	11.23	69.90	0.2005	7.471	60.53	0.2107	5.589	60.46	0.1971	4.460	60.39	0.1827	3.965	60.21	0.1818
20	11.75	74.89	0.2066	7.819	63.33	0.2228	5.851	63.27	0.2033	4.670	63.20	0.1889	4.215	63.03	0.1880
40	12.27	79.88	0.2127	8.167	66.13	0.2349	6.113	66.07	0.2094	4.883	66.06	0.1944	4.465	65.85	0.1937
60	12.79	84.87	0.2187	8.515	68.91	0.2469	6.375	68.87	0.2155	5.097	68.87	0.2000	4.717	68.67	0.2000
80	13.31	89.86	0.2248	8.863	71.69	0.2589	6.637	71.66	0.2216	5.311	71.65	0.2055	4.969	71.49	0.2055
100	13.83	94.85	0.2309	9.211	74.47	0.2709	6.899	74.44	0.2277	5.525	74.43	0.2110	5.221	74.31	0.2110
120	14.35	99.84	0.2369	9.559	77.25	0.2829	7.161	77.22	0.2338	5.739	77.21	0.2165	5.473	77.13	0.2165
140	14.87	104.83	0.2429	9.907	80.03	0.2949	7.423	80.00	0.2399	5.953	80.00	0.2220	5.725	80.00	0.2220
160	15.39	109.82	0.2489	10.255	82.81	0.3069	7.685	82.78	0.2459	6.167	82.77	0.2275	5.977	82.77	0.2275
180	15.91	114.81	0.2549	10.603	85.59	0.3189	7.947	85.56	0.2519	6.381	85.55	0.2330	6.229	85.55	0.2330
200	16.43	119.80	0.2609	10.951	88.37	0.3309	8.209	88.34	0.2579	6.595	88.33	0.2385	6.481	88.33	0.2385
220	16.95	124.79	0.2669	11.299	91.15	0.3429	8.471	91.12	0.2639	6.809	91.11	0.2440	6.733	91.11	0.2440

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