Forane® 410A

(50.0% R-32, 50.0% R-125 by weight)

Thermodynamic Properties (Saturation) - SI

This data was generated using the NIST REFPROP Database

(Lemmon, E.W., Huber, M.L., McLinden, M.O. NIST Standard Reference Database 23: Reference Fluid Thermodynamic and Transport Properties-REFPROP, Version 9.0, National Institute of Standards and Technology, Standard Reference Data Program, Gaithersburg, 2010)

Thermodynamic Properties of R-410A - Saturation

Temperature (°C)	Pressure (kPa)		Volume (m^3/kg)		Density (kg/m^3)		Enthalpy (kJ/kg)		Entropy (kJ/(kg K))		Temperature (°C)
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	
-100	3.7	3.7	0.0007	5.3664	1494.6	0.186	60.72	371.75	0.3703	2.1673	-100
-99	4.1	4.0	0.0007	4.9285	1491.7	0.203	62.06	372.35	0.3781	2.1604	-99
-98	4.4	4.4	0.0007	4.5316	1488.9	0.221	63.41	372.94	0.3858	2.1536	-98
-97	4.9	4.8	0.0007	4.1715	1486.0	0.240	64.76	373.53	0.3935	2.1469	-97
-96	5.3	5.2	0.0007	3.8444	1483.1	0.260	66.11	374.12	0.4011	2.1404	-96
-95	5.8	5.7	0.0007	3.5469	1480.2	0.282	67.45	374.72	0.4087	2.1340	-95
-94	6.3	6.2	0.0007	3.2760	1477.3	0.305	68.80	375.31	0.4162	2.1276	-94
-93	6.8	6.8	0.0007	3.0289	1474.5	0.330	70.14	375.90	0.4237	2.1214	-93
-92	7.4	7.3	0.0007	2.8035	1471.6	0.357	71.49	376.49	0.4311	2.1153	-92
-91	8.0	8.0	0.0007	2.5974	1468.7	0.385	72.83	377.08	0.4385	2.1093	-91
-90	8.7	8.6	0.0007	2.4090	1465.8	0.415	74.18	377.66	0.4459	2.1034	-90
-89	9.4	9.3	0.0007	2.2364	1462.9	0.447	75.52	378.25	0.4532	2.0976	-89
-88	10.2	10.1	0.0007	2.0782	1459.9	0.481	76.87	378.84	0.4605	2.0919	-88
-87	11.0	10.9	0.0007	1.9330	1457.0	0.517	78.21	379.42	0.4677	2.0863	-87
-86	11.9	11.8	0.0007	1.7996	1454.1	0.556	79.56	380.01	0.4749	2.0808	-86
-85	12.8	12.7	0.0007	1.6770	1451.2	0.596	80.90	380.59	0.4821	2.0754	-85
-84	13.8	13.7	0.0007	1.5641	1448.3	0.639	82.25	381.18	0.4892	2.0700	-84
-83	14.8	14.7	0.0007	1.4601	1445.3	0.685	83.59	381.76	0.4963	2.0648	-83
-82	15.9	15.8	0.0007	1.3641	1442.4	0.733	84.94	382.34	0.5034	2.0596	-82
-81	17.1	17.0	0.0007	1.2756	1439.4	0.784	86.28	382.92	0.5104	2.0545	-81
-80	18.4	18.3	0.0007	1.1938	1436.5	0.838	87.63	383.50	0.5174	2.0495	-80
-79	19.7	19.6	0.0007	1.1181	1433.5	0.894	88.97	384.07	0.5243	2.0446	-79
-78	21.1	21.0	0.0007	1.0481	1430.6	0.954	90.32	384.65	0.5312	2.0398	-78
-77	22.6	22.5	0.0007	0.9832	1427.6	1.017	91.66	385.22	0.5381	2.0350	-77
-76	24.2	24.0	0.0007	0.9231	1424.6	1.083	93.01	385.80	0.5449	2.0304	-76
-75	25.8	25.7	0.0007	0.8673	1421.7	1.153	94.36	386.37	0.5517	2.0257	-75
-74	27.6	27.4	0.0007	0.8154	1418.7	1.226	95.71	386.94	0.5585	2.0212	-74
-73	29.4	29.3	0.0007	0.7672	1415.7	1.303	97.06	387.50	0.5653	2.0167	-73
-72	31.4	31.2	0.0007	0.7224	1412.7	1.384	98.40	388.07	0.5720	2.0124	-72
-71	33.5	33.3	0.0007	0.6807	1409.7	1.469	99.75	388.63	0.5787	2.0080	-71
-70	35.6	35.4	0.0007	0.6418	1406.7	1.558	101.10	389.20	0.5853	2.0038	-70
-69	37.9	37.7	0.0007	0.6055	1403.7	1.651	102.46	389.76	0.5920	1.9996	-69
-68	40.3	40.1	0.0007	0.5717	1400.7	1.749	103.81	390.32	0.5986	1.9954	-68
-67	42.8	42.6	0.0007	0.5401	1397.7	1.851	105.16	390.87	0.6051	1.9914	-67
-66	45.5	45.2	0.0007	0.5106	1394.6	1.959	106.51	391.43	0.6117	1.9874	-66
-65	48.2	48.0	0.0007	0.4830	1391.6	2.070	107.87	391.98	0.6182	1.9834	-65
-64	51.1	50.9	0.0007	0.4572	1388.5	2.187	109.23	392.53	0.6247	1.9795	-64
-63	54.2	54.0	0.0007	0.4330	1385.5	2.310	110.58	393.08	0.6311	1.9757	-63
-62	57.4	57.1	0.0007	0.4103	1382.4	2.437	111.94	393.63	0.6376	1.9719	-62
-61	60.7	60.5	0.0007	0.3891	1379.4	2.570	113.30	394.18	0.6440	1.9682	-61
-60	64.2	64.0	0.0007	0.3691	1376.3	2.709	114.66	394.72	0.6504	1.9645	-60
-59	67.9	67.6	0.0007	0.3504	1373.2	2.854	116.02	395.26	0.6567	1.9609	-59
-58	71.7	71.4	0.0007	0.3328	1370.1	3.005	117.38	395.80	0.6631	1.9574	-58
-57	75.7	75.4	0.0007	0.3163	1367.0	3.162	118.74	396.33	0.6694	1.9538	-57
-56	79.9	79.6	0.0007	0.3007	1363.9	3.326	120.11	396.87	0.6756	1.9504	-56
-55	84.3	83.9	0.0007	0.2861	1360.8	3.496	121.47	397.40	0.6819	1.9470	-55
-54	88.8	88.4	0.0007	0.2723	1357.7	3.673	122.84	397.93	0.6881	1.9436	-54
-53	93.5	93.2	0.0007	0.2593	1354.6	3.857	124.21	398.45	0.6944	1.9403	-53
-52	98.5	98.1	0.0007	0.2470	1351.4	4.049	125.58	398.98	0.7006	1.9370	-52
-51	103.6	103.2	0.0007	0.2354	1348.3	4.247	126.95	399.50	0.7067	1.9338	-51
-50	109.0	108.6	0.0007	0.2245	1345.1	4.454	128.32	400.02	0.7129	1.9306	-50
-49	114.6	114.1	0.0007	0.2142	1342.0	4.668	129.70	400.53	0.7190	1.9275	-49
-48	120.4	119.9	0.0007	0.2045	1338.8	4.891	131.08	401.04	0.7251	1.9244	-48

Thermodynamic Properties of R-410A - Saturation

Temperature (°C)	Pressure (kPa)		Volume (m^3/kg)		Density (kg/m^3)		Enthalpy (kJ/kg)		Entropy (kJ/(kg K))		Temperature (°C)
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	
-47	126.4	125.9	0.0007	0.1953	1335.6	5.122	132.45	401.55	0.7312	1.9213	-47
-46	132.6	132.1	0.0008	0.1865	1332.4	5.361	133.83	402.06	0.7373	1.9183	-46
-45	139.1	138.6	0.0008	0.1783	1329.2	5.609	135.21	402.57	0.7433	1.9153	-45
-44	145.9	145.3	0.0008	0.1705	1326.0	5.866	136.60	403.07	0.7493	1.9124	-44
-43	152.9	152.3	0.0008	0.1631	1322.8	6.132	137.98	403.57	0.7553	1.9095	-43
-42	160.2	159.6	0.0008	0.1561	1319.5	6.408	139.37	404.06	0.7613	1.9066	-42
-41	167.7	167.1	0.0008	0.1494	1316.3	6.693	140.76	404.55	0.7673	1.9038	-41
-40	175.5	174.9	0.0008	0.1431	1313.0	6.989	142.15	405.04	0.7732	1.9010	-40
-39	183.6	182.9	0.0008	0.1371	1309.8	7.294	143.54	405.53	0.7792	1.8983	-39
-38	192.0	191.3	0.0008	0.1314	1306.5	7.610	144.93	406.01	0.7851	1.8956	-38
-37	200.7	199.9	0.0008	0.1260	1303.2	7.937	146.33	406.49	0.7910	1.8929	-37
-36	209.6	208.9	0.0008	0.1209	1299.9	8.275	147.73	406.97	0.7969	1.8902	-36
-35	218.9	218.1	0.0008	0.1160	1296.6	8.624	149.13	407.44	0.8027	1.8876	-35
-34	228.5	227.7	0.0008	0.1113	1293.2	8.984	150.53	407.91	0.8086	1.8850	-34
-33	238.5	237.6	0.0008	0.1069	1289.9	9.357	151.94	408.38	0.8144	1.8824	-33
-32	248.7	247.9	0.0008	0.1027	1286.5	9.741	153.34	408.84	0.8202	1.8799	-32
-31	259.3	258.4	0.0008	0.0986	1283.2	10.138	154.75	409.30	0.8260	1.8774	-31
-30	270.3	269.4	0.0008	0.0948	1279.8	10.548	156.17	409.75	0.8318	1.8749	-30
-29	281.6	280.6	0.0008	0.0912	1276.4	10.970	157.58	410.20	0.8376	1.8725	-29
-28	293.3	292.3	0.0008	0.0877	1273.0	11.406	159.00	410.65	0.8433	1.8700	-28
-27	305.3	304.3	0.0008	0.0843	1269.6	11.856	160.42	411.09	0.8491	1.8677	-27
-26	317.7	316.6	0.0008	0.0812	1266.1	12.320	161.84	411.53	0.8548	1.8653	-26
-25	330.6	329.4	0.0008	0.0781	1262.7	12.798	163.27	411.97	0.8605	1.8629	-25
-24	343.8	342.6	0.0008	0.0752	1259.2	13.291	164.70	412.40	0.8662	1.8606	-24
-23	357.4	356.1	0.0008	0.0725	1255.7	13.798	166.13	412.83	0.8719	1.8583	-23
-22	371.4	370.1	0.0008	0.0698	1252.2	14.322	167.56	413.25	0.8776	1.8560	-22
-21	385.8	384.5	0.0008	0.0673	1248.7	14.860	169.00	413.67	0.8833	1.8538	-21
-20	400.7	399.3	0.0008	0.0649	1245.1	15.415	170.44	414.08	0.8889	1.8516	-20
-19	416.0	414.5	0.0008	0.0626	1241.6	15.987	171.88	414.49	0.8946	1.8493	-19
-18	431.7	430.2	0.0008	0.0603	1238.0	16.575	173.33	414.90	0.9002	1.8471	-18
-17	447.9	446.4	0.0008	0.0582	1234.4	17.181	174.78	415.30	0.9058	1.8450	-17
-16	464.5	463.0	0.0008	0.0562	1230.8	17.805	176.23	415.70	0.9114	1.8428	-16
-15	481.7	480.0	0.0008	0.0542	1227.1	18.446	177.69	416.09	0.9170	1.8407	-15
-14	499.2	497.6	0.0008	0.0523	1223.5	19.106	179.15	416.47	0.9226	1.8386	-14
-13	517.3	515.6	0.0008	0.0505	1219.8	19.786	180.61	416.86	0.9282	1.8365	-13
-12	535.9	534.1	0.0008	0.0488	1216.1	20.484	182.08	417.23	0.9337	1.8344	-12
-11	555.0	553.1	0.0008	0.0472	1212.4	21.203	183.55	417.60	0.9393	1.8323	-11
-10	574.6	572.7	0.0008	0.0456	1208.7	21.942	185.02	417.97	0.9449	1.8303	-10
-9	594.7	592.7	0.0008	0.0440	1204.9	22.702	186.50	418.33	0.9504	1.8282	-9
-8	615.3	613.3	0.0008	0.0426	1201.1	23.484	187.99	418.68	0.9559	1.8262	-8
-7	636.5	634.4	0.0008	0.0412	1197.3	24.288	189.47	419.03	0.9615	1.8242	-7
-6	658.3	656.1	0.0008	0.0398	1193.5	25.114	190.96	419.37	0.9670	1.8222	-6
-5	680.6	678.3	0.0008	0.0385	1189.6	25.963	192.46	419.71	0.9725	1.8202	-5
-4	703.4	701.1	0.0008	0.0373	1185.8	26.836	193.96	420.04	0.9780	1.8182	-4
-3	726.8	724.4	0.0008	0.0361	1181.9	27.733	195.46	420.37	0.9835	1.8162	-3
-2	750.9	748.4	0.0008	0.0349	1177.9	28.655	196.97	420.69	0.9890	1.8143	-2
-1	775.5	772.9	0.0009	0.0338	1174.0	29.603	198.48	421.00	0.9945	1.8123	-1
0	800.7	798.1	0.0009	0.0327	1170.0	30.576	200.00	421.31	1.0000	1.8104	0
1	826.5	823.8	0.0009	0.0317	1166.0	31.577	201.52	421.60	1.0055	1.8084	1
2	853.0	850.2	0.0009	0.0307	1161.9	32.605	203.05	421.90	1.0110	1.8065	2
3	880.1	877.2	0.0009	0.0297	1157.8	33.662	204.58	422.18	1.0164	1.8046	3
4	907.8	904.9	0.0009	0.0288	1153.7	34.747	206.12	422.46	1.0219	1.8027	4
5	936.2	933.2	0.0009	0.0279	1149.6	35.863	207.66	422.73	1.0274	1.8007	5

Thermodynamic Properties of R-410A - Saturation

Temperature (°C)	Pressure (kPa)		Volume (m^3/kg)		Density (kg/m^3)		Enthalpy (kJ/kg)		Entropy (kJ/(kg K))		Temperature (°C)
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	
6	965.3	962.1	0.0009	0.0270	1145.4	37.009	209.21	422.99	1.0328	1.7988	6
7	995.0	991.8	0.0009	0.0262	1141.2	38.187	210.77	423.25	1.0383	1.7969	7
8	1025.4	1022.1	0.0009	0.0254	1137.0	39.397	212.33	423.49	1.0438	1.7950	8
9	1056.5	1053.1	0.0009	0.0246	1132.7	40.640	213.89	423.73	1.0492	1.7931	9
10	1088.4	1084.8	0.0009	0.0239	1128.4	41.917	215.46	423.96	1.0547	1.7912	10
11	1120.9	1117.2	0.0009	0.0231	1124.0	43.230	217.04	424.18	1.0602	1.7893	11
12	1154.1	1150.4	0.0009	0.0224	1119.7	44.579	218.63	424.39	1.0656	1.7874	12
13	1188.1	1184.3	0.0009	0.0218	1115.2	45.966	220.22	424.59	1.0711	1.7855	13
14	1222.9	1218.9	0.0009	0.0211	1110.8	47.390	221.81	424.79	1.0765	1.7836	14
15	1258.4	1254.3	0.0009	0.0205	1106.3	48.855	223.42	424.97	1.0820	1.7816	15
16	1294.6	1290.5	0.0009	0.0199	1101.7	50.360	225.03	425.14	1.0875	1.7797	16
17	1331.7	1327.4	0.0009	0.0193	1097.1	51.907	226.64	425.31	1.0929	1.7778	17
18	1369.5	1365.1	0.0009	0.0187	1092.5	53.497	228.27	425.46	1.0984	1.7758	18
19	1408.2	1403.6	0.0009	0.0181	1087.8	55.133	229.90	425.60	1.1039	1.7739	19
20	1447.6	1443.0	0.0009	0.0176	1083.1	56.814	231.54	425.73	1.1094	1.7719	20
21	1487.9	1483.1	0.0009	0.0171	1078.3	58.544	233.19	425.85	1.1148	1.7700	21
22	1529.0	1524.1	0.0009	0.0166	1073.4	60.323	234.85	425.95	1.1203	1.7680	22
23	1570.9	1566.0	0.0009	0.0161	1068.6	62.152	236.51	426.04	1.1258	1.7660	23
24	1613.8	1608.7	0.0009	0.0156	1063.6	64.035	238.18	426.12	1.1313	1.7640	24
25	1657.4	1652.2	0.0009	0.0152	1058.6	65.972	239.86	426.19	1.1368	1.7619	25
26	1702.0	1696.7	0.0009	0.0147	1053.6	67.966	241.55	426.25	1.1424	1.7599	26
27	1747.5	1742.0	0.0010	0.0143	1048.4	70.019	243.25	426.28	1.1479	1.7578	27
28	1793.8	1788.3	0.0010	0.0139	1043.3	72.133	244.96	426.31	1.1534	1.7558	28
29	1841.1	1835.4	0.0010	0.0135	1038.0	74.310	246.68	426.32	1.1590	1.7537	29
30	1889.3	1883.5	0.0010	0.0131	1032.7	76.553	248.41	426.31	1.1645	1.7515	30
31	1938.5	1932.6	0.0010	0.0127	1027.3	78.864	250.15	426.29	1.1701	1.7494	31
32	1988.6	1982.6	0.0010	0.0123	1021.9	81.246	251.90	426.25	1.1757	1.7472	32
33	2039.7	2033.5	0.0010	0.0119	1016.4	83.703	253.66	426.20	1.1813	1.7450	33
34	2091.8	2085.5	0.0010	0.0116	1010.8	86.237	255.43	426.12	1.1869	1.7428	34
35	2144.9	2138.5	0.0010	0.0113	1005.1	88.851	257.22	426.03	1.1925	1.7405	35
36	2198.9	2192.4	0.0010	0.0109	999.3	91.550	259.01	425.92	1.1982	1.7382	36
37	2254.0	2247.4	0.0010	0.0106	993.5	94.338	260.82	425.79	1.2038	1.7359	37
38	2310.2	2303.5	0.0010	0.0103	987.5	97.218	262.65	425.63	1.2095	1.7335	38
39	2367.4	2360.5	0.0010	0.0100	981.5	100.200	264.48	425.46	1.2152	1.7311	39
40	2425.6	2418.7	0.0010	0.0097	975.3	103.270	266.33	425.26	1.2210	1.7286	40
41	2485.0	2477.9	0.0010	0.0094	969.1	106.460	268.20	425.04	1.2267	1.7261	41
42	2545.4	2538.3	0.0010	0.0091	962.7	109.760	270.08	424.79	1.2325	1.7235	42
43	2607.0	2599.8	0.0010	0.0088	956.2	113.180	271.98	424.52	1.2383	1.7209	43
44	2669.7	2662.4	0.0011	0.0086	949.6	116.720	273.90	424.21	1.2442	1.7182	44
45	2733.5	2726.1	0.0011	0.0083	942.9	120.400	275.84	423.88	1.2501	1.7155	45
46	2798.5	2791.1	0.0011	0.0080	936.0	124.230	277.80	423.52	1.2560	1.7127	46
47	2864.7	2857.2	0.0011	0.0078	929.0	128.200	279.77	423.12	1.2619	1.7098	47
48	2932.1	2924.5	0.0011	0.0076	921.8	132.330	281.77	422.69	1.2680	1.7069	48
49	3000.7	2993.0	0.0011	0.0073	914.4	136.640	283.80	422.22	1.2740	1.7038	49
50	3070.6	3062.8	0.0011	0.0071	906.8	141.140	285.85	421.72	1.2801	1.7007	50
51	3141.7	3133.9	0.0011	0.0069	899.0	145.830	287.93	421.17	1.2863	1.6975	51
52	3214.0	3206.2	0.0011	0.0066	891.0	150.740	290.03	420.57	1.2926	1.6941	52
53	3287.7	3279.9	0.0011	0.0064	882.8	155.890	292.17	419.92	1.2989	1.6906	53
54	3362.7	3354.9	0.0011	0.0062	874.3	161.290	294.35	419.22	1.3053	1.6871	54
55	3439.1	3431.3	0.0012	0.0060	865.5	166.970	296.57	418.46	1.3118	1.6833	55
56	3516.8	3509.0	0.0012	0.0058	856.3	172.960	298.83	417.64	1.3184	1.6794	56
57	3595.9	3588.2	0.0012	0.0056	846.8	179.290	301.13	416.74	1.3251	1.6753	57
58	3676.4	3668.7	0.0012	0.0054	836.9	186.010	303.50	415.77	1.3319	1.6711	58

Thermodynamic Properties of R-410A - Saturation

Temperature (°C)	Pressure (kPa)		Volume (m^3/kg)		Density (kg/m^3)		Enthalpy (kJ/kg)		Entropy (kJ/(kg K))		Temperature (°C)
	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	
59	3758.4	3750.8	0.0012	0.0052	826.5	193.150	305.92	414.71	1.3390	1.6666	59
60	3841.8	3834.4	0.0012	0.0050	815.5	200.780	308.41	413.54	1.3461	1.6618	60
61	3926.8	3919.5	0.0012	0.0048	803.9	208.970	310.99	412.27	1.3535	1.6567	61
62	4013.3	4006.1	0.0013	0.0046	791.6	217.810	313.66	410.86	1.3612	1.6513	62
63	4101.4	4094.4	0.0013	0.0044	778.3	227.420	316.44	409.30	1.3691	1.6455	63
64	4191.1	4184.3	0.0013	0.0042	764.0	237.940	319.35	407.56	1.3775	1.6392	64
65	4282.4	4276.0	0.0013	0.0040	748.4	249.590	322.43	405.60	1.3862	1.6322	65
66	4375.4	4369.3	0.0014	0.0038	731.0	262.680	325.73	403.35	1.3956	1.6245	66
67	4470.2	4464.5	0.0014	0.0036	711.3	277.660	329.32	400.74	1.4058	1.6158	67
68	4566.8	4561.6	0.0015	0.0034	688.3	295.310	333.32	397.62	1.4171	1.6056	68
69	4665.1	4660.6	0.0015	0.0032	659.8	317.070	338.01	393.72	1.4304	1.5933	69
70	4765.3	4761.7	0.0016	0.0029	620.5	346.390	344.10	388.43	1.4477	1.5769	70
71	4866.9	4864.9	0.0018	0.0025	543.8	397.650	355.32	379.22	1.4799	1.5493	71