



Forane[®] 408A

(7.0% R-125, 46.0% R-143a, 47.0% R-22 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-408A - 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	2.7	2.6	0.0007	6.4234	1440.6	0.156	79.40	338.30	0.4551	1.9530	-100
-99	3.0	2.8	0.0007	5.8996	1438.0	0.170	80.54	338.85	0.4617	1.9476	-99
-98	3.2	3.1	0.0007	5.4249	1435.4	0.184	81.68	339.40	0.4683	1.9422	-98
-97	3.5	3.4	0.0007	4.9941	1432.8	0.200	82.82	339.96	0.4748	1.9370	-97
-96	3.8	3.7	0.0007	4.6027	1430.2	0.217	83.97	340.51	0.4812	1.9319	-96
-95	4.2	4.0	0.0007	4.2467	1427.6	0.235	85.11	341.07	0.4877	1.9268	-95
-94	4.6	4.3	0.0007	3.9225	1425.0	0.255	86.25	341.63	0.4941	1.9219	-94
-93	4.9	4.7	0.0007	3.6269	1422.4	0.276	87.39	342.19	0.5004	1.9171	-93
-92	5.4	5.1	0.0007	3.3571	1419.8	0.298	88.54	342.75	0.5067	1.9123	-92
-91	5.8	5.6	0.0007	3.1105	1417.1	0.321	89.68	343.30	0.5130	1.9077	-91
-90	6.3	6.0	0.0007	2.8850	1414.5	0.347	90.83	343.87	0.5193	1.9031	-90
-89	6.8	6.5	0.0007	2.6784	1411.9	0.373	91.97	344.43	0.5255	1.8986	-89
-88	7.4	7.1	0.0007	2.4891	1409.3	0.402	93.12	344.99	0.5318	1.8942	-88
-87	8.0	7.6	0.0007	2.3153	1406.7	0.432	94.27	345.55	0.5379	1.8899	-87
-86	8.6	8.2	0.0007	2.1557	1404.0	0.464	95.41	346.11	0.5441	1.8857	-86
-85	9.2	8.9	0.0007	2.0089	1401.4	0.498	96.56	346.68	0.5502	1.8815	-85
-84	10.0	9.6	0.0007	1.8738	1398.8	0.534	97.71	347.24	0.5563	1.8775	-84
-83	10.7	10.3	0.0007	1.7493	1396.1	0.572	98.86	347.80	0.5623	1.8735	-83
-82	11.5	11.1	0.0007	1.6345	1393.5	0.612	100.01	348.37	0.5684	1.8696	-82
-81	12.4	11.9	0.0007	1.5285	1390.9	0.654	101.16	348.93	0.5744	1.8657	-81
-80	13.3	12.8	0.0007	1.4306	1388.2	0.699	102.31	349.50	0.5803	1.8620	-80
-79	14.2	13.7	0.0007	1.3400	1385.6	0.746	103.47	350.07	0.5863	1.8583	-79
-78	15.2	14.7	0.0007	1.2562	1382.9	0.796	104.62	350.63	0.5922	1.8546	-78
-77	16.3	15.7	0.0007	1.1786	1380.3	0.849	105.77	351.20	0.5981	1.8511	-77
-76	17.4	16.8	0.0007	1.1066	1377.6	0.904	106.93	351.77	0.6040	1.8476	-76
-75	18.6	18.0	0.0007	1.0398	1374.9	0.962	108.09	352.33	0.6098	1.8442	-75
-74	19.9	19.2	0.0007	0.9777	1372.3	1.023	109.24	352.90	0.6156	1.8408	-74
-73	21.2	20.5	0.0007	0.9200	1369.6	1.087	110.40	353.47	0.6214	1.8375	-73
-72	22.6	21.8	0.0007	0.8664	1366.9	1.154	111.56	354.03	0.6272	1.8343	-72
-71	24.1	23.3	0.0007	0.8164	1364.2	1.225	112.72	354.60	0.6330	1.8311	-71
-70	25.6	24.8	0.0007	0.7699	1361.6	1.299	113.88	355.17	0.6387	1.8280	-70
-69	27.2	26.4	0.0007	0.7265	1358.9	1.377	115.05	355.74	0.6444	1.8249	-69
-68	28.9	28.1	0.0007	0.6860	1356.2	1.458	116.21	356.30	0.6501	1.8219	-68
-67	30.7	29.8	0.0007	0.6482	1353.5	1.543	117.38	356.87	0.6558	1.8190	-67
-66	32.6	31.7	0.0007	0.6129	1350.8	1.632	118.55	357.44	0.6614	1.8161	-66
-65	34.6	33.6	0.0007	0.5798	1348.1	1.725	119.71	358.00	0.6670	1.8132	-65
-64	36.7	35.6	0.0007	0.5489	1345.4	1.822	120.88	358.57	0.6726	1.8104	-64
-63	38.9	37.8	0.0007	0.5200	1342.6	1.923	122.06	359.13	0.6782	1.8077	-63
-62	41.2	40.0	0.0007	0.4928	1339.9	2.029	123.23	359.70	0.6838	1.8050	-62
-61	43.5	42.3	0.0007	0.4674	1337.2	2.140	124.40	360.26	0.6893	1.8024	-61
-60	46.0	44.8	0.0007	0.4435	1334.4	2.255	125.58	360.83	0.6948	1.7998	-60
-59	48.6	47.4	0.0008	0.4211	1331.7	2.375	126.75	361.39	0.7003	1.7973	-59
-58	51.4	50.0	0.0008	0.4000	1328.9	2.500	127.93	361.96	0.7058	1.7948	-58
-57	54.2	52.8	0.0008	0.3802	1326.2	2.630	129.11	362.52	0.7113	1.7923	-57
-56	57.2	55.7	0.0008	0.3616	1323.4	2.766	130.29	363.08	0.7167	1.7899	-56
-55	60.3	58.8	0.0008	0.3441	1320.7	2.907	131.48	363.64	0.7221	1.7876	-55
-54	63.5	62.0	0.0008	0.3275	1317.9	3.053	132.66	364.20	0.7275	1.7852	-54
-53	66.9	65.3	0.0008	0.3120	1315.1	3.205	133.85	364.76	0.7329	1.7830	-53
-52	70.4	68.7	0.0008	0.2973	1312.3	3.364	135.04	365.32	0.7383	1.7807	-52
-51	74.1	72.3	0.0008	0.2835	1309.5	3.528	136.23	365.88	0.7437	1.7785	-51
-50	77.9	76.1	0.0008	0.2704	1306.7	3.698	137.42	366.44	0.7490	1.7764	-50
-49	81.9	80.0	0.0008	0.2580	1303.9	3.875	138.61	366.99	0.7543	1.7743	-49
-48	86.0	84.0	0.0008	0.2464	1301.1	4.059	139.81	367.55	0.7596	1.7722	-48

Thermodynamic Properties of R-408A - 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	90.3	88.3	0.0008	0.2353	1298.2	4.249	141.01	368.10	0.7649	1.7702	-47
-46	94.7	92.6	0.0008	0.2249	1295.4	4.447	142.21	368.66	0.7702	1.7681	-46
-45	99.3	97.2	0.0008	0.2150	1292.6	4.651	143.41	369.21	0.7755	1.7662	-45
-44	104.1	101.9	0.0008	0.2057	1289.7	4.862	144.61	369.76	0.7807	1.7642	-44
-43	109.1	106.8	0.0008	0.1968	1286.8	5.082	145.82	370.31	0.7859	1.7623	-43
-42	114.3	111.9	0.0008	0.1884	1284.0	5.308	147.02	370.86	0.7911	1.7605	-42
-41	119.6	117.2	0.0008	0.1804	1281.1	5.543	148.23	371.40	0.7964	1.7586	-41
-40	125.2	122.7	0.0008	0.1728	1278.2	5.786	149.44	371.95	0.8015	1.7568	-40
-39	130.9	128.3	0.0008	0.1657	1275.3	6.036	150.66	372.49	0.8067	1.7550	-39
-38	136.8	134.2	0.0008	0.1588	1272.4	6.296	151.87	373.04	0.8119	1.7533	-38
-37	143.0	140.3	0.0008	0.1524	1269.5	6.564	153.09	373.58	0.8170	1.7516	-37
-36	149.4	146.6	0.0008	0.1462	1266.6	6.841	154.31	374.12	0.8222	1.7499	-36
-35	156.0	153.1	0.0008	0.1403	1263.6	7.126	155.53	374.65	0.8273	1.7482	-35
-34	162.8	159.8	0.0008	0.1348	1260.7	7.421	156.76	375.19	0.8324	1.7466	-34
-33	169.8	166.8	0.0008	0.1294	1257.7	7.726	157.98	375.73	0.8375	1.7450	-33
-32	177.1	174.0	0.0008	0.1244	1254.8	8.040	159.21	376.26	0.8426	1.7434	-32
-31	184.6	181.4	0.0008	0.1196	1251.8	8.364	160.44	376.79	0.8476	1.7419	-31
-30	192.4	189.1	0.0008	0.1150	1248.8	8.699	161.68	377.32	0.8527	1.7403	-30
-29	200.4	197.0	0.0008	0.1106	1245.8	9.043	162.92	377.84	0.8577	1.7388	-29
-28	208.6	205.2	0.0008	0.1064	1242.8	9.399	164.15	378.37	0.8628	1.7374	-28
-27	217.2	213.6	0.0008	0.1024	1239.8	9.765	165.40	378.89	0.8678	1.7359	-27
-26	226.0	222.3	0.0008	0.0986	1236.7	10.142	166.64	379.41	0.8728	1.7345	-26
-25	235.0	231.3	0.0008	0.0950	1233.7	10.531	167.89	379.93	0.8778	1.7331	-25
-24	244.4	240.5	0.0008	0.0915	1230.6	10.931	169.14	380.45	0.8828	1.7317	-24
-23	254.0	250.1	0.0008	0.0882	1227.6	11.343	170.39	380.96	0.8878	1.7303	-23
-22	263.9	259.9	0.0008	0.0850	1224.5	11.767	171.64	381.48	0.8928	1.7290	-22
-21	274.1	270.0	0.0008	0.0819	1221.4	12.203	172.90	381.98	0.8977	1.7276	-21
-20	284.6	280.4	0.0008	0.0790	1218.3	12.652	174.16	382.49	0.9027	1.7263	-20
-19	295.4	291.1	0.0008	0.0763	1215.1	13.114	175.42	383.00	0.9076	1.7250	-19
-18	306.5	302.1	0.0008	0.0736	1212.0	13.590	176.69	383.50	0.9126	1.7238	-18
-17	318.0	313.5	0.0008	0.0710	1208.9	14.078	177.96	384.00	0.9175	1.7225	-17
-16	329.7	325.1	0.0008	0.0686	1205.7	14.581	179.23	384.50	0.9224	1.7213	-16
-15	341.8	337.1	0.0008	0.0662	1202.5	15.098	180.50	384.99	0.9273	1.7201	-15
-14	354.2	349.4	0.0008	0.0640	1199.3	15.628	181.78	385.48	0.9322	1.7189	-14
-13	367.0	362.1	0.0008	0.0618	1196.1	16.174	183.06	385.97	0.9371	1.7177	-13
-12	380.1	375.1	0.0008	0.0598	1192.9	16.735	184.34	386.45	0.9420	1.7165	-12
-11	393.6	388.5	0.0008	0.0578	1189.7	17.311	185.63	386.94	0.9469	1.7153	-11
-10	407.4	402.2	0.0008	0.0559	1186.4	17.903	186.92	387.42	0.9517	1.7142	-10
-9	421.6	416.3	0.0008	0.0540	1183.1	18.510	188.21	387.89	0.9566	1.7131	-9
-8	436.1	430.7	0.0008	0.0523	1179.9	19.135	189.51	388.37	0.9614	1.7120	-8
-7	451.1	445.5	0.0008	0.0506	1176.6	19.775	190.81	388.84	0.9663	1.7109	-7
-6	466.4	460.7	0.0009	0.0489	1173.2	20.433	192.11	389.30	0.9711	1.7098	-6
-5	482.1	476.3	0.0009	0.0474	1169.9	21.109	193.42	389.77	0.9759	1.7087	-5
-4	498.2	492.3	0.0009	0.0459	1166.5	21.802	194.73	390.23	0.9808	1.7076	-4
-3	514.7	508.7	0.0009	0.0444	1163.2	22.514	196.04	390.68	0.9856	1.7066	-3
-2	531.6	525.5	0.0009	0.0430	1159.8	23.244	197.36	391.14	0.9904	1.7055	-2
-1	548.9	542.7	0.0009	0.0417	1156.4	23.993	198.68	391.58	0.9952	1.7045	-1
0	566.7	560.4	0.0009	0.0404	1152.9	24.762	200.00	392.03	1.0000	1.7035	0
1	584.8	578.4	0.0009	0.0391	1149.5	25.551	201.33	392.47	1.0048	1.7025	1
2	603.4	596.9	0.0009	0.0379	1146.0	26.360	202.66	392.91	1.0096	1.7015	2
3	622.5	615.9	0.0009	0.0368	1142.5	27.190	203.99	393.34	1.0144	1.7005	3
4	642.0	635.3	0.0009	0.0357	1139.0	28.042	205.33	393.77	1.0191	1.6995	4
5	661.9	655.1	0.0009	0.0346	1135.5	28.915	206.68	394.20	1.0239	1.6985	5

Thermodynamic Properties of R-408A - 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	682.3	675.4	0.0009	0.0335	1131.9	29.810	208.02	394.62	1.0287	1.6975	6
7	703.2	696.2	0.0009	0.0325	1128.4	30.729	209.37	395.03	1.0335	1.6966	7
8	724.6	717.4	0.0009	0.0316	1124.8	31.671	210.73	395.44	1.0382	1.6956	8
9	746.4	739.1	0.0009	0.0306	1121.1	32.637	212.09	395.85	1.0430	1.6947	9
10	768.7	761.3	0.0009	0.0297	1117.5	33.627	213.45	396.25	1.0477	1.6937	10
11	791.5	784.0	0.0009	0.0289	1113.8	34.642	214.82	396.65	1.0525	1.6928	11
12	814.9	807.2	0.0009	0.0280	1110.1	35.684	216.19	397.04	1.0572	1.6918	12
13	838.7	830.9	0.0009	0.0272	1106.4	36.751	217.57	397.43	1.0620	1.6909	13
14	863.0	855.2	0.0009	0.0264	1102.7	37.846	218.95	397.81	1.0667	1.6900	14
15	887.9	879.9	0.0009	0.0257	1098.9	38.968	220.34	398.19	1.0715	1.6890	15
16	913.3	905.2	0.0009	0.0249	1095.1	40.119	221.73	398.56	1.0762	1.6881	16
17	939.2	931.0	0.0009	0.0242	1091.3	41.299	223.12	398.92	1.0809	1.6872	17
18	965.7	957.4	0.0009	0.0235	1087.4	42.509	224.52	399.28	1.0857	1.6862	18
19	992.7	984.3	0.0009	0.0229	1083.5	43.750	225.93	399.64	1.0904	1.6853	19
20	1020.3	1011.8	0.0009	0.0222	1079.6	45.022	227.34	399.98	1.0951	1.6844	20
21	1048.4	1039.8	0.0009	0.0216	1075.6	46.326	228.76	400.32	1.0999	1.6835	21
22	1077.2	1068.4	0.0009	0.0210	1071.6	47.663	230.18	400.66	1.1046	1.6825	22
23	1106.5	1097.6	0.0009	0.0204	1067.6	49.035	231.61	400.99	1.1093	1.6816	23
24	1136.4	1127.4	0.0009	0.0198	1063.6	50.442	233.04	401.31	1.1141	1.6807	24
25	1166.9	1157.8	0.0009	0.0193	1059.5	51.885	234.48	401.62	1.1188	1.6797	25
26	1198.0	1188.8	0.0009	0.0187	1055.4	53.365	235.92	401.93	1.1235	1.6788	26
27	1229.7	1220.3	0.0010	0.0182	1051.2	54.883	237.37	402.23	1.1283	1.6778	27
28	1262.0	1252.6	0.0010	0.0177	1047.0	56.441	238.83	402.52	1.1330	1.6769	28
29	1295.0	1285.4	0.0010	0.0172	1042.8	58.039	240.29	402.80	1.1378	1.6759	29
30	1328.5	1318.9	0.0010	0.0168	1038.5	59.679	241.76	403.08	1.1425	1.6749	30
31	1362.8	1353.0	0.0010	0.0163	1034.2	61.361	243.23	403.35	1.1472	1.6740	31
32	1397.7	1387.8	0.0010	0.0159	1029.8	63.089	244.71	403.61	1.1520	1.6730	32
33	1433.2	1423.2	0.0010	0.0154	1025.4	64.862	246.20	403.86	1.1568	1.6720	33
34	1469.4	1459.3	0.0010	0.0150	1020.9	66.682	247.70	404.10	1.1615	1.6710	34
35	1506.3	1496.1	0.0010	0.0146	1016.4	68.552	249.20	404.33	1.1663	1.6700	35
36	1543.9	1533.6	0.0010	0.0142	1011.8	70.472	250.71	404.55	1.1711	1.6689	36
37	1582.1	1571.7	0.0010	0.0138	1007.2	72.444	252.23	404.77	1.1758	1.6679	37
38	1621.1	1610.6	0.0010	0.0134	1002.6	74.471	253.75	404.97	1.1806	1.6669	38
39	1660.8	1650.2	0.0010	0.0131	997.9	76.553	255.29	405.16	1.1854	1.6658	39
40	1701.2	1690.5	0.0010	0.0127	993.1	78.694	256.83	405.34	1.1902	1.6647	40
41	1742.3	1731.5	0.0010	0.0124	988.2	80.896	258.38	405.51	1.1950	1.6636	41
42	1784.2	1773.3	0.0010	0.0120	983.3	83.160	259.94	405.66	1.1999	1.6625	42
43	1826.8	1815.8	0.0010	0.0117	978.4	85.489	261.51	405.81	1.2047	1.6613	43
44	1870.1	1859.0	0.0010	0.0114	973.3	87.887	263.09	405.94	1.2096	1.6602	44
45	1914.3	1903.1	0.0010	0.0111	968.2	90.355	264.68	406.06	1.2144	1.6590	45
46	1959.2	1947.9	0.0010	0.0108	963.0	92.897	266.28	406.16	1.2193	1.6578	46
47	2004.9	1993.5	0.0010	0.0105	957.8	95.515	267.89	406.25	1.2242	1.6566	47
48	2051.4	2039.9	0.0010	0.0102	952.4	98.214	269.51	406.33	1.2291	1.6553	48
49	2098.7	2087.1	0.0011	0.0099	947.0	101.000	271.15	406.38	1.2340	1.6540	49
50	2146.8	2135.1	0.0011	0.0096	941.5	103.870	272.79	406.43	1.2389	1.6527	50
51	2195.7	2184.0	0.0011	0.0094	935.9	106.830	274.45	406.45	1.2439	1.6513	51
52	2245.5	2233.7	0.0011	0.0091	930.2	109.890	276.12	406.46	1.2489	1.6499	52
53	2296.1	2284.3	0.0011	0.0088	924.4	113.060	277.80	406.45	1.2539	1.6485	53
54	2347.6	2335.7	0.0011	0.0086	918.5	116.330	279.50	406.41	1.2589	1.6470	54
55	2399.9	2388.0	0.0011	0.0084	912.4	119.710	281.22	406.36	1.2640	1.6455	55
56	2453.2	2441.1	0.0011	0.0081	906.3	123.210	282.95	406.28	1.2691	1.6439	56
57	2507.3	2495.2	0.0011	0.0079	900.0	126.850	284.69	406.18	1.2742	1.6423	57
58	2562.3	2550.2	0.0011	0.0077	893.6	130.610	286.46	406.06	1.2793	1.6407	58

Thermodynamic Properties of R-408A - 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	2618.3	2606.1	0.0011	0.0074	887.0	134.520	288.24	405.91	1.2845	1.6389	59
60	2675.2	2663.0	0.0011	0.0072	880.3	138.590	290.05	405.73	1.2897	1.6371	60
61	2733.0	2720.8	0.0011	0.0070	873.4	142.810	291.87	405.52	1.2950	1.6353	61
62	2791.8	2779.6	0.0012	0.0068	866.3	147.220	293.72	405.28	1.3003	1.6333	62
63	2851.6	2839.3	0.0012	0.0066	859.0	151.810	295.59	405.00	1.3057	1.6313	63
64	2912.4	2900.1	0.0012	0.0064	851.5	156.610	297.49	404.68	1.3111	1.6292	64
65	2974.1	2961.9	0.0012	0.0062	843.8	161.640	299.41	404.33	1.3166	1.6270	65
66	3036.9	3024.7	0.0012	0.0060	835.9	166.900	301.37	403.93	1.3222	1.6247	66
67	3100.8	3088.6	0.0012	0.0058	827.6	172.440	303.36	403.48	1.3278	1.6223	67
68	3165.6	3153.5	0.0012	0.0056	819.1	178.260	305.38	402.98	1.3335	1.6197	68
69	3231.6	3219.5	0.0012	0.0054	810.2	184.410	307.45	402.43	1.3393	1.6170	69
70	3298.7	3286.7	0.0012	0.0052	801.0	190.930	309.56	401.80	1.3452	1.6142	70
71	3366.9	3355.0	0.0013	0.0051	791.3	197.850	311.72	401.11	1.3513	1.6111	71
72	3436.2	3424.4	0.0013	0.0049	781.1	205.240	313.94	400.33	1.3575	1.6079	72
73	3506.7	3495.1	0.0013	0.0047	770.4	213.170	316.22	399.45	1.3638	1.6044	73
74	3578.4	3566.9	0.0013	0.0045	759.0	221.720	318.58	398.47	1.3703	1.6006	74
75	3651.3	3640.1	0.0013	0.0043	746.9	231.010	321.02	397.36	1.3771	1.5964	75
76	3725.5	3714.5	0.0014	0.0041	733.8	241.210	323.58	396.09	1.3841	1.5919	76
77	3800.9	3790.3	0.0014	0.0040	719.6	252.510	326.27	394.62	1.3915	1.5868	77
78	3877.7	3867.5	0.0014	0.0038	703.9	265.260	329.12	392.91	1.3994	1.5811	78
79	3955.9	3946.2	0.0015	0.0036	686.1	279.960	332.21	390.87	1.4078	1.5745	79
80	4035.5	4026.5	0.0015	0.0034	665.4	297.490	335.63	388.35	1.4172	1.5665	80
81	4116.7	4108.5	0.0016	0.0031	640.0	319.650	339.60	385.07	1.4280	1.5565	81
82	4199.4	4192.7	0.0017	0.0028	604.7	351.410	344.71	380.22	1.4421	1.5421	82
83	4283.0	4282.5	0.0020	0.0020	512.8	496.990	356.75	358.78	1.4755	1.4812	83