



Freon™ 410A

Refrigerant (R-410A)

Thermodynamic Properties (SI Units)

New tables of the thermodynamic properties of Freon™ 410A refrigerant (ASHRAE designation: R-410A [50/50]), have been developed and are presented here. These tables are based on extensive experimental measurements. Equations have been developed, based on the Martin-Hou equation of state, which represent the data with accuracy and consistency throughout the entire range of temperature, pressure, and density. Vapor enthalpy and entropy are calculated from the standard Martin-Hou equations. Additional equations have been developed for the calculation of saturated liquid enthalpy, latent enthalpy, and saturated liquid entropy and are presented here.

Physical Properties

Chemical Formula	$\text{CH}_2\text{F}_2/\text{CHF}_2\text{CF}_3$ (50/50% by weight)
Molecular Weight	72.58
Boiling Point at One Atmosphere	-51.58 °C (-60.84 °F)
Critical Temperature	72.13 °C (161.83 °F) 345.28 K (621.50 °R)
Critical Pressure	4926.1 kPa (abs) (714.50 psia)
Critical Density	488.90 kg/m ³ (30.52 lb/ft ³)
Critical Volume	0.00205 m ³ /kg (0.0328 ft ³ /lb)

Units and Factors

- t = Temperature in °C
- T = Temperature in K = °C + 273.15
- P = Absolute Pressure in KiloPascals (kPa [abs])
- v_f = Volume of saturated liquid in m³/kg
- v_g = Volume of saturated vapor in m³/kg
- V = Volume of superheated vapor in m³/kg
- $d_f = 1/v_f$ = Density of saturated liquid in kg/m³
- $d_g = 1/v_g$ = Density of saturated vapor in kg/m³
- h_f = Enthalpy of saturated liquid in kJ/kg
- h_{fg} = Enthalpy of vaporization in kJ/kg
- h_g = Enthalpy of saturated vapor in kJ/kg
- H = Enthalpy of superheated vapor in kJ/kg
- s_f = Entropy of saturated liquid in kJ/(kg)(K)
- s_g = Entropy of saturated vapor in kJ/(kg)(K)
- S = Entropy of superheated vapor in kJ/(kg)(K)
- C_p = Heat capacity at constant pressure in kJ/(kg)(°C)
- C_v = Heat capacity at constant volume in kJ/(kg)(°C)
- v_s = Velocity of sound in m/sec

The gas constant, $R = 8.314 \text{ J}/(\text{mole})(\text{K})$ for Freon™ 410A,
 $R = 0.11455 \text{ kJ}/\text{kg}\cdot\text{K}$

One atmosphere = 101.325 kPa

Reference point for enthalpy and entropy:

$h_f = 200 \text{ kJ}/\text{kg}$ at 0 °C

$s_f = 1 \text{ kJ}/\text{kg}\cdot\text{K}$ at 0 °C



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Equations

Conversion Factors—SI Units to I/P Units

Properties listed in the following thermodynamic tables in SI units can be converted to I/P units using the conversion factors shown below. Please note that in converting enthalpy and entropy from SI to I/P units, a change in reference states must be included (from $H = 200$ and $S = 1$ at $0\text{ }^\circ\text{C}$ for SI units to $H = 0$ and $S = 0$ at $-40\text{ }^\circ\text{F}$ for I/P units). In the conversion equation below, $H(\text{ref})$ and $S(\text{ref})$ are the saturated liquid enthalpy and entropy at $-40\text{ }^\circ\text{C}$. For Freon™ 410A, $H(\text{ref}) = 141.1\text{ kJ/kg}$ and $S(\text{ref}) = 0.7666\text{ kJ/kg}\cdot\text{K}$.

$$P(\text{psia}) = P(\text{kPa [abs]}) \cdot 0.14504$$

$$T(\text{ }^\circ\text{F}) = T[\text{ }^\circ\text{C}] \cdot 1.8 + 32$$

$$D(\text{lb/ft}^3) = (\text{kg/m}^3) \cdot 0.062428$$

$$V(\text{ft}^3/\text{lb}) = (\text{m}^3/\text{kg}) \cdot 16.018$$

$$H(\text{Btu/lb}) = H(\text{kJ/kg}) - H(\text{ref}) \cdot 0.43021$$

$$S(\text{Btu/lb}\cdot^\circ\text{R}) = S(\text{kJ/kg}\cdot\text{K}) - S(\text{ref}) \cdot 0.23901$$

$$C_p(\text{Btu/lb}\cdot^\circ\text{F}) = p(\text{kJ/kg}\cdot\text{K}) \cdot 0.23901$$

$$C_v(\text{Btu/lb}\cdot^\circ\text{F}) = v(\text{kJ/kg}\cdot\text{K}) \cdot 0.23901$$

$$v_s(\text{ft/sec}) = s(\text{m/sec}) \cdot 3.2808$$

Martin-Hou Equation of State

Coefficients for the Martin-Hou equation of state are presented below:

$$P = RT/(V-b) + \sum_{i=2}^5 (A_i + B_i T + C_i \exp[-kT/T_c]) / (V-b)^i$$

For SI units

T and T_c are in $\text{K} = \text{ }^\circ\text{C} + 273.15$, V is in m^3/kg , and P is in kPa (abs) .

$$R = 0.11455\text{ kJ/kg}\cdot\text{K for Freon}^\text{TM} 410\text{A}$$

$b, A_i, B_i, C_i,$ and k are constants:

$$A_2 = -1.721781\text{ E-01} \quad A_4 = -4.329207\text{ E-07}$$

$$B_2 = 1.646288\text{ E-04} \quad B_4 = 0.000000\text{ E+00}$$

$$C_2 = -6.293665\text{ E+00} \quad C_4 = 0.000000\text{ E+00}$$

$$A_3 = 2.381558\text{ E-04} \quad A_5 = -6.241072\text{ E-10}$$

$$B_3 = -1.462803\text{ E-08} \quad B_5 = 1.380469\text{ E-12}$$

$$C_3 = 1.532461\text{ E-02} \quad C_5 = 1.604125\text{ E-07}$$

$$b = 4.355134\text{ E-04} \quad k = 5.750000\text{ E+00}$$

X and Y are constants used in the vapor enthalpy and entropy equations for the Martin-Hou equation of state:

$$X = 2.987192\text{ E+02} \quad Y = 8.463990\text{ E-01}$$

For ENG units

T and T_c are in $^\circ\text{R} = \text{ }^\circ\text{F} + 459.67$, V is in ft^3/lb , and P is in psia .

$$R = 0.147852 (\text{psia})(\text{ft}^3)/\text{lb}\cdot^\circ\text{R for Freon}^\text{TM} 410\text{A}$$

$b, A_i, B_i, C_i,$ and k are constants:

$$A_2 = -6.407692\text{ E+00} \quad A_4 = -4.134026\text{ E-03}$$

$$B_2 = 3.403745\text{ E-03} \quad B_4 = 0.000000\text{ E+00}$$

$$C_2 = -2.342218\text{ E+02} \quad C_4 = 0.000000\text{ E+00}$$

$$A_3 = 1.419729\text{ E-01} \quad A_5 = -9.546510\text{ E-05}$$

$$B_3 = -4.844597\text{ E-06} \quad B_5 = 1.173112\text{ E-07}$$

$$C_3 = 9.135529\text{ E+00} \quad C_5 = 2.453712\text{ E-02}$$

$$b = 6.976251\text{ E-03} \quad k = 5.750000\text{ E+00}$$

X and Y are constants used in the vapor enthalpy and entropy equations for the Martin-Hou equation of state:

$$X = 6.779200\text{ E+01} \quad Y = -7.838900\text{ E-02}$$

Ideal Gas Heat Capacity (at constant pressure):

$$C_p^\circ = a + bT + cT^2 + dT^3$$

Ideal Gas Heat Capacity (at constant volume):

$$C_v^\circ = C_p^\circ - R$$

For SI units

$$C_p^\circ \text{ and } C_v^\circ = \text{kJ/kg}\cdot\text{K}$$

$$R = 0.114550\text{ kJ/kg}\cdot\text{K for Freon}^\text{TM} 410\text{A}$$

$$T \text{ is in } \text{K} = \text{ }^\circ\text{C} + 273.15$$

$a, b, c,$ and d are constants:

$$a = 2.676084\text{ E-01} \quad c = -9.848184\text{ E-07}$$

$$b = 2.115353\text{ E-03} \quad d = 6.493781\text{ E-11}$$

For ENG units

$$C_p^\circ \text{ and } C_v^\circ = \text{Btu/lb}\cdot^\circ\text{R}$$

$$R = 0.02737815\text{ Btu/lb}\cdot^\circ\text{R for Freon}^\text{TM} 410\text{A}$$

$$T \text{ is in } ^\circ\text{R} = \text{ }^\circ\text{F} + 459.67$$

$a, b, c,$ and d are constants:

$$a = 6.395995\text{ E-02} \quad c = -7.264730\text{ E-08}$$

$$b = 2.808787\text{ E-04} \quad d = 2.661267\text{ E-12}$$

Liquid Enthalpy, Latent Enthalpy, and Liquid Entropy Equations

Saturated Liquid Enthalpy

$$h_f = A + BX + C(X)^2 + D(X)^3 + E(X)^4 + F(X)^5$$

where $X = (1 - T_r)^{1/3} - X_\infty$ and $T_r = T/T_c$

Latent Enthalpy

$$h_{fg} = h_g - h_f$$

Saturated Liquid Entropy

$$s_f = s_g - ((h_g - h_f)/T)$$

For SI units

h_f , h_g , and h_{fg} are in kJ/kg

s_f and s_g are in kJ/(kg·K)

T and T_c are in K = °C + 273.15

A, B, C, D, E, F, and X_o are constants:

$$A = 2.211749 \text{ E}+02 \quad E = 1.052000 \text{ E}+03$$

$$B = -5.149668 \text{ E}+02 \quad F = 1.596000 \text{ E}+03$$

$$C = -6.316250 \text{ E}+02 \quad X_o = 5.541498 \text{ E}-01$$

$$D = -2.622749 \text{ E}+02$$

For ENG units

h_f , h_g , and h_{fg} are in Btu/lb

s_f and s_g are in Btu/(lb·°R)

T and T_c are in °R = °F + 459.67

A, B, C, D, E, F, and X_o are constants:

$$A = 3.442467 \text{ E}+01 \quad E = 4.528092 \text{ E}+02$$

$$B = -2.215447 \text{ E}+02 \quad F = 6.866152 \text{ E}+02$$

$$C = -2.717314 \text{ E}+02 \quad X_o = 5.541498 \text{ E}-01$$

$$D = -1.128898 \text{ E}+02$$

Vapor Pressure

$$\log_n (P_{\text{sat}}/P_c) = 1/T_r (A + BX + CX^2 + DX^3 + EX^4 + FX^5)$$

where $X = (1 - T_r) - X_o$, and $T_r = T/T_c$

A, B, C, D, E, F, and X_o are constants:

Constants for vapor pressure of saturated liquid (bubble point), p_i :

$$A = -1.437600 \text{ E}+00 \quad E = -4.068750 \text{ E}+00$$

$$B = -6.871500 \text{ E}+00 \quad F = -1.233300 \text{ E}+00$$

$$C = -5.362300 \text{ E}-01 \quad X_o = 2.086902 \text{ E}-01$$

$$D = -3.826420 \text{ E}+00$$

Constants for vapor pressure of saturated vapor (dew point), p_g :

$$A = -1.440004 \text{ E}+00 \quad E = -3.521484 \text{ E}+00$$

$$B = -6.865265 \text{ E}+00 \quad F = -7.750000 \text{ E}+00$$

$$C = -5.354309 \text{ E}-01 \quad X_o = 2.086902 \text{ E}-01$$

$$D = -3.749023 \text{ E}+00$$

Because both pressure and temperature appear in the reduced form in the equation, the same constants can be used for either SI or ENG units.

For SI units

T and T_c are in K = °C + 273.15

P and P_c are in kPa (abs)

For ENG units

T and T_c are in °R = °F + 459.67

P and P_c are in psia

Density of the Saturated Liquid

$$d_f/D_c = A_f + B_f(1-T_r)^{(1/3)} + C_f(1-T_r)^{(2/3)} + D_f(1-T_r) + E_f(1-T_r)^{(4/3)}$$

A_f , B_f , C_f , D_f , and E_f are constants:

$$A_f = 1.000000 \text{ E}+00 \quad D_f = 1.819972 \text{ E}+00$$

$$B_f = 1.984734 \text{ E}+00 \quad E_f = -7.171684 \text{ E}-01$$

$$C_f = -1.767593 \text{ E}-01$$

Because both density and temperature appear in the reduced form in the equation, the same constants can be used for either SI or ENG units.

For SI units

T_r and T/T_c , both in K = °C + 273.15

d_f and D_c are in kg/m³

For ENG units

T_r and T/T_c , both in °R = °F + 459.67

d_f and D_c are in lb/ft³

Table 1. Freon™ 410A Saturation Properties—Temperature Table

Temp [°C]	Pressure [kPa]		Volume [m³/kg]		Density [kg/m³]		Enthalpy [kJ/kg]			Entropy [kJ/(kg)(K)]		Temp [°C]
	Liquid p_g	Vapor p_g	Liquid v_f	Vapor v_g	Liquid $1/v_f$	Vapor $1/v_g$	Liquid H_f	Latent H_{fg}	Vapor H_g	Liquid S_f	Vapor S_g	
-100	3.8	3.7	0.0007	5.3267	1509.0	0.188	63.3	311.4	374.7	0.3789	2.1774	-100
-99	4.1	4.1	0.0007	4.8882	1506.2	0.205	64.5	310.8	375.3	0.3857	2.1703	-99
-98	4.5	4.4	0.0007	4.4913	1503.4	0.223	65.7	310.2	375.8	0.3925	2.1633	-98
-97	4.9	4.9	0.0007	4.1317	1500.6	0.242	66.9	309.5	376.4	0.3993	2.1565	-97
-96	5.4	5.3	0.0007	3.8053	1497.8	0.263	68.1	308.9	377.0	0.4061	2.1498	-96
-95	5.9	5.8	0.0007	3.5088	1494.9	0.285	69.3	308.3	377.6	0.4128	2.1432	-95
-94	6.4	6.3	0.0007	3.2391	1492.1	0.309	70.5	307.6	378.2	0.4196	2.1367	-94
-93	6.9	6.8	0.0007	2.9935	1489.3	0.334	71.7	307.0	378.7	0.4263	2.1304	-93
-92	7.5	7.4	0.0007	2.7694	1486.4	0.361	73.0	306.3	379.3	0.4330	2.1241	-92
-91	8.2	8.1	0.0007	2.5649	1483.6	0.390	74.2	305.7	379.9	0.4398	2.1180	-91
-90	8.8	8.8	0.0007	2.3780	1480.7	0.421	75.4	305.0	380.5	0.4465	2.1120	-90
-89	9.6	9.5	0.0007	2.2069	1477.9	0.453	76.6	304.4	381.0	0.4532	2.1061	-89
-88	10.3	10.2	0.0007	2.0502	1475.0	0.488	77.9	303.7	381.6	0.4599	2.1003	-88
-87	11.2	11.1	0.0007	1.9065	1472.1	0.525	79.1	303.0	382.2	0.4666	2.0945	-87
-86	12.0	12.0	0.0007	1.7746	1469.2	0.564	80.4	302.4	382.7	0.4732	2.0889	-86
-85	13.0	12.9	0.0007	1.6534	1466.3	0.605	81.6	301.7	383.3	0.4799	2.0834	-85
-84	14.0	13.9	0.0007	1.5419	1463.4	0.649	82.9	301.0	383.9	0.4866	2.0780	-84
-83	15.0	14.9	0.0007	1.4391	1460.5	0.695	84.1	300.3	384.4	0.4932	2.0727	-83
-82	16.2	16.1	0.0007	1.3445	1457.6	0.744	85.4	299.7	385.0	0.4998	2.0674	-82
-81	17.4	17.3	0.0007	1.2571	1454.7	0.795	86.6	299.0	385.6	0.5064	2.0623	-81
-80	18.6	18.5	0.0007	1.1764	1451.7	0.850	87.9	298.3	386.1	0.5130	2.0572	-80
-79	20.0	19.9	0.0007	1.1019	1448.8	0.908	89.2	297.6	386.7	0.5196	2.0523	-79
-78	21.4	21.3	0.0007	1.0328	1445.8	0.968	90.4	296.9	387.3	0.5262	2.0474	-78
-77	22.9	22.8	0.0007	0.9689	1442.8	1.032	91.7	296.1	387.8	0.5328	2.0426	-77
-76	24.5	24.4	0.0007	0.9097	1439.9	1.099	93.0	295.4	388.4	0.5393	2.0378	-76
-75	26.2	26.1	0.0007	0.8547	1436.9	1.170	94.2	294.7	389.0	0.5459	2.0332	-75
-74	27.9	27.8	0.0007	0.8037	1433.9	1.244	95.5	294.0	389.5	0.5524	2.0286	-74
-73	29.8	29.7	0.0007	0.7563	1430.9	1.322	96.8	293.2	390.1	0.5589	2.0241	-73
-72	31.8	31.7	0.0007	0.7121	1427.9	1.404	98.1	292.5	390.6	0.5654	2.0196	-72
-71	33.9	33.7	0.0007	0.6711	1424.8	1.490	99.4	291.8	391.2	0.5719	2.0153	-71
-70	36.0	35.9	0.0007	0.6328	1421.8	1.580	100.7	291.0	391.7	0.5784	2.0110	-70
-69	38.3	38.2	0.0007	0.5972	1418.8	1.675	102.0	290.3	392.3	0.5849	2.0067	-69
-68	40.7	40.6	0.0007	0.5639	1415.7	1.773	103.3	289.5	392.8	0.5913	2.0026	-68
-67	43.3	43.2	0.0007	0.5328	1412.7	1.877	104.6	288.8	393.4	0.5978	1.9985	-67
-66	45.9	45.8	0.0007	0.5038	1409.6	1.985	105.9	288.0	393.9	0.6042	1.9944	-66
-65	48.7	48.6	0.0007	0.4766	1406.5	2.098	107.2	287.2	394.4	0.6106	1.9904	-65
-64	51.7	51.5	0.0007	0.4512	1403.4	2.216	108.5	286.4	395.0	0.6170	1.9865	-64
-63	54.7	54.6	0.0007	0.4274	1400.3	2.340	109.9	285.7	395.5	0.6234	1.9827	-63
-62	57.9	57.8	0.0007	0.4051	1397.2	2.469	111.2	284.9	396.0	0.6298	1.9788	-62
-61	61.3	61.2	0.0007	0.3842	1394.1	2.603	112.5	284.1	396.6	0.6361	1.9751	-61
-60	64.8	64.7	0.0007	0.3646	1390.9	2.743	113.8	283.3	397.1	0.6425	1.9714	-60
-59	68.5	68.3	0.0007	0.3461	1387.8	2.889	115.2	282.5	397.6	0.6488	1.9678	-59
-58	72.3	72.2	0.0007	0.3288	1384.6	3.041	116.5	281.6	398.2	0.6551	1.9642	-58
-57	76.4	76.2	0.0007	0.3126	1381.4	3.199	117.9	280.8	398.7	0.6614	1.9606	-57
-56	80.6	80.4	0.0007	0.2972	1378.3	3.364	119.2	280.0	399.2	0.6677	1.9571	-56
-55	84.9	84.7	0.0007	0.2828	1375.1	3.536	120.5	279.2	399.7	0.6740	1.9537	-55
-54	89.5	89.3	0.0007	0.2692	1371.9	3.714	121.9	278.3	400.2	0.6803	1.9503	-54
-53	94.2	94.0	0.0007	0.2565	1368.7	3.899	123.2	277.5	400.7	0.6865	1.9470	-53
-52	99.2	99.0	0.0007	0.2444	1365.4	4.092	124.6	276.6	401.2	0.6928	1.9437	-52
-51	104.3	104.1	0.0007	0.2330	1362.2	4.292	126.0	275.8	401.7	0.6990	1.9404	-51
-50	109.7	109.4	0.0007	0.2222	1358.9	4.500	127.3	274.9	402.2	0.7052	1.9372	-50
-49	115.3	115.0	0.0007	0.2121	1355.7	4.715	128.7	274.1	402.7	0.7114	1.9340	-49
-48	121.1	120.8	0.0007	0.2025	1352.4	4.939	130.1	273.2	403.2	0.7176	1.9309	-48
-47	127.1	126.8	0.0007	0.1934	1349.1	5.171	131.4	272.3	403.7	0.7238	1.9278	-47
-46	133.4	133.0	0.0007	0.1848	1345.8	5.411	132.8	271.4	404.2	0.7299	1.9248	-46
-45	139.9	139.5	0.0007	0.1767	1342.5	5.660	134.2	270.5	404.7	0.7361	1.9217	-45
-44	146.6	146.3	0.0008	0.1690	1339.2	5.918	135.6	269.6	405.2	0.7422	1.9188	-44
-43	153.6	153.2	0.0008	0.1617	1335.8	6.186	137.0	268.7	405.7	0.7483	1.9158	-43
-42	160.9	160.5	0.0008	0.1547	1332.5	6.462	138.4	267.8	406.1	0.7544	1.9129	-42
-41	168.4	168.0	0.0008	0.1482	1329.1	6.749	139.7	266.9	406.6	0.7605	1.9101	-41

Table 1. Freon™ 410A Saturation Properties—Temperature Table (continued)

Temp [°C]	Pressure [kPa]		Volume [m³/kg]		Density [kg/m³]		Enthalpy [kJ/kg]			Entropy [kJ/(kg)(K)]		Temp [°C]
	Liquid p_g	Vapor p_g	Liquid v_f	Vapor v_g	Liquid $1/v_f$	Vapor $1/v_g$	Liquid H_f	Latent H_{fg}	Vapor H_g	Liquid S_f	Vapor S_g	
-40	176.2	175.8	0.0008	0.1419	1325.7	7.045	141.1	265.9	407.1	0.7666	1.9072	-40
-39	184.3	183.8	0.0008	0.1360	1322.3	7.352	142.5	265.0	407.6	0.7727	1.9045	-39
-38	192.7	192.2	0.0008	0.1304	1318.9	7.669	144.0	264.1	408.0	0.7787	1.9017	-38
-37	201.3	200.8	0.0008	0.1251	1315.5	7.996	145.4	263.1	408.5	0.7847	1.8990	-37
-36	210.3	209.8	0.0008	0.1200	1312.1	8.335	146.8	262.2	408.9	0.7908	1.8963	-36
-35	219.6	219.0	0.0008	0.1151	1308.6	8.685	148.2	261.2	409.4	0.7968	1.8936	-35
-34	229.2	228.6	0.0008	0.1105	1305.2	9.046	149.6	260.2	409.8	0.8028	1.8910	-34
-33	239.1	238.4	0.0008	0.1062	1301.7	9.419	151.0	259.3	410.3	0.8088	1.8884	-33
-32	249.3	248.6	0.0008	0.1020	1298.2	9.805	152.4	258.3	410.7	0.8148	1.8858	-32
-31	259.9	259.2	0.0008	0.0980	1294.7	10.202	153.9	257.3	411.2	0.8207	1.8832	-31
-30	270.8	270.1	0.0008	0.0942	1291.2	10.613	155.3	256.3	411.6	0.8267	1.8807	-30
-29	282.1	281.3	0.0008	0.0906	1287.6	11.036	156.7	255.3	412.0	0.8326	1.8782	-29
-28	293.7	292.9	0.0008	0.0872	1284.1	11.473	158.2	254.3	412.5	0.8385	1.8757	-28
-27	305.7	304.9	0.0008	0.0839	1280.5	11.923	159.6	253.3	412.9	0.8445	1.8733	-27
-26	318.1	317.2	0.0008	0.0807	1276.9	12.388	161.1	252.2	413.3	0.8504	1.8709	-26
-25	330.9	329.9	0.0008	0.0777	1273.3	12.866	162.5	251.2	413.7	0.8562	1.8685	-25
-24	344.0	343.0	0.0008	0.0749	1269.7	13.360	164.0	250.1	414.1	0.8621	1.8661	-24
-23	357.6	356.6	0.0008	0.0721	1266.0	13.868	165.4	249.1	414.5	0.8680	1.8638	-23
-22	371.5	370.5	0.0008	0.0695	1262.3	14.391	166.9	248.0	414.9	0.8738	1.8614	-22
-21	385.9	384.8	0.0008	0.0670	1258.7	14.931	168.4	247.0	415.3	0.8797	1.8591	-21
-20	400.7	399.5	0.0008	0.0646	1255.0	15.486	169.8	245.9	415.7	0.8855	1.8569	-20
-19	415.9	414.7	0.0008	0.0623	1251.3	16.058	171.3	244.8	416.1	0.8913	1.8546	-19
-18	431.6	430.3	0.0008	0.0601	1247.5	16.647	172.8	243.7	416.5	0.8971	1.8523	-18
-17	447.7	446.4	0.0008	0.0580	1243.8	17.253	174.3	242.6	416.9	0.9029	1.8501	-17
-16	464.3	462.9	0.0008	0.0559	1240.0	17.877	175.7	241.5	417.2	0.9087	1.8479	-16
-15	481.3	479.9	0.0008	0.0540	1236.2	18.519	177.2	240.4	417.6	0.9145	1.8457	-15
-14	498.9	497.4	0.0008	0.0521	1232.4	19.179	178.7	239.3	418.0	0.9203	1.8436	-14
-13	516.9	515.3	0.0008	0.0504	1228.6	19.859	180.2	238.1	418.3	0.9260	1.8414	-13
-12	535.4	533.7	0.0008	0.0486	1224.7	20.558	181.7	237.0	418.7	0.9318	1.8393	-12
-11	554.4	552.7	0.0008	0.0470	1220.8	21.276	183.2	235.8	419.1	0.9375	1.8372	-11
-10	573.9	572.1	0.0008	0.0454	1216.9	22.016	184.7	234.7	419.4	0.9432	1.8351	-10
-9	593.9	592.1	0.0008	0.0439	1213.0	22.776	186.2	233.5	419.7	0.9489	1.8330	-9
-8	614.4	612.6	0.0008	0.0425	1209.1	23.558	187.7	232.3	420.1	0.9547	1.8309	-8
-7	635.5	633.6	0.0008	0.0411	1205.1	24.361	189.3	231.1	420.4	0.9604	1.8288	-7
-6	657.2	655.1	0.0008	0.0397	1201.1	25.187	190.8	229.9	420.7	0.9660	1.8268	-6
-5	679.3	677.3	0.0008	0.0384	1197.1	26.036	192.3	228.7	421.0	0.9717	1.8247	-5
-4	702.1	699.9	0.0008	0.0372	1193.1	26.909	193.8	227.5	421.4	0.9774	1.8227	-4
-3	725.4	723.2	0.0008	0.0360	1189.0	27.806	195.4	226.3	421.7	0.9830	1.8207	-3
-2	749.3	747.0	0.0008	0.0348	1184.9	28.728	196.9	225.1	422.0	0.9887	1.8187	-2
-1	773.9	771.4	0.0009	0.0337	1180.8	29.675	198.5	223.8	422.3	0.9943	1.8167	-1
0	799.0	796.5	0.0009	0.0326	1176.7	30.649	200.0	222.5	422.5	1.0000	1.8147	0
1	824.7	822.1	0.0009	0.0316	1172.5	31.649	201.6	221.3	422.8	1.0056	1.8128	1
2	851.0	848.4	0.0009	0.0306	1168.3	32.676	203.1	220.0	423.1	1.0112	1.8108	2
3	878.0	875.3	0.0009	0.0297	1164.1	33.732	204.7	218.7	423.4	1.0168	1.8088	3
4	905.6	902.8	0.0009	0.0287	1159.8	34.817	206.2	217.4	423.6	1.0225	1.8069	4
5	933.9	931.0	0.0009	0.0278	1155.5	35.931	207.8	216.1	423.9	1.0281	1.8049	5
6	962.9	959.8	0.0009	0.0270	1151.2	37.076	209.4	214.8	424.1	1.0337	1.8030	6
7	992.5	989.3	0.0009	0.0261	1146.9	38.252	211.0	213.4	424.4	1.0392	1.8011	7
8	1022.8	1019.5	0.0009	0.0253	1142.5	39.461	212.6	212.1	424.6	1.0448	1.7991	8
9	1053.8	1050.4	0.0009	0.0246	1138.1	40.702	214.1	210.7	424.9	1.0504	1.7972	9
10	1085.5	1082.0	0.0009	0.0238	1133.7	41.977	215.7	209.3	425.1	1.0560	1.7953	10
11	1117.9	1114.3	0.0009	0.0231	1129.2	43.288	217.3	207.9	425.3	1.0616	1.7934	11
12	1151.0	1147.3	0.0009	0.0224	1124.7	44.634	219.0	206.5	425.5	1.0671	1.7914	12
13	1184.9	1181.1	0.0009	0.0217	1120.1	46.017	220.6	205.1	425.7	1.0727	1.7895	13
14	1219.5	1215.6	0.0009	0.0211	1115.6	47.437	222.2	203.7	425.9	1.0783	1.7876	14
15	1254.9	1250.8	0.0009	0.0205	1110.9	48.897	223.8	202.2	426.1	1.0838	1.7857	15
16	1291.0	1286.9	0.0009	0.0198	1106.3	50.398	225.4	200.8	426.2	1.0894	1.7838	16
17	1328.0	1323.7	0.0009	0.0193	1101.6	51.939	227.1	199.3	426.4	1.0949	1.7818	17
18	1365.7	1361.3	0.0009	0.0187	1096.9	53.523	228.7	197.8	426.5	1.1005	1.7799	18
19	1404.2	1399.6	0.0009	0.0181	1092.1	55.152	230.4	196.3	426.7	1.1060	1.7780	19

Table 1. Freon™ 410A Saturation Properties—Temperature Table (continued)

Temp [°C]	Pressure [kPa]		Volume [m³/kg]		Density [kg/m³]		Enthalpy [kJ/kg]			Entropy [kJ/(kg)(K)]		Temp [°C]
	Liquid p_g	Vapor p_g	Liquid v_f	Vapor v_g	Liquid $1/v_f$	Vapor $1/v_g$	Liquid H_f	Latent H_{fg}	Vapor H_g	Liquid S_f	Vapor S_g	
20	1443.6	1438.8	0.0009	0.0176	1087.2	56.825	232.0	194.8	426.8	1.1116	1.7760	20
21	1483.7	1478.9	0.0009	0.0171	1082.4	58.545	233.7	193.2	426.9	1.1172	1.7741	21
22	1524.7	1519.7	0.0009	0.0166	1077.5	60.314	235.4	191.7	427.1	1.1227	1.7721	22
23	1566.6	1561.4	0.0009	0.0161	1072.5	62.132	237.1	190.1	427.2	1.1283	1.7702	23
24	1609.3	1604.0	0.0009	0.0156	1067.5	64.001	238.7	188.5	427.3	1.1338	1.7682	24
25	1652.9	1647.4	0.0009	0.0152	1062.4	65.924	240.4	186.9	427.3	1.1394	1.7662	25
26	1697.3	1691.7	0.0010	0.0147	1057.3	67.901	242.1	185.3	427.4	1.1450	1.7643	26
27	1742.7	1736.9	0.0010	0.0143	1052.1	69.935	243.9	183.6	427.5	1.1506	1.7623	27
28	1788.9	1783.0	0.0010	0.0139	1046.9	72.028	245.6	181.9	427.5	1.1562	1.7603	28
29	1836.1	1830.0	0.0010	0.0135	1041.6	74.181	247.3	180.2	427.5	1.1618	1.7582	29
30	1884.2	1877.9	0.0010	0.0131	1036.3	76.398	249.1	178.5	427.6	1.1674	1.7562	30
31	1933.3	1926.8	0.0010	0.0127	1030.9	78.679	250.8	176.8	427.6	1.1730	1.7541	31
32	1983.3	1976.6	0.0010	0.0123	1025.4	81.028	252.6	175.0	427.6	1.1786	1.7521	32
33	2034.3	2027.4	0.0010	0.0120	1019.9	83.447	254.3	173.2	427.5	1.1843	1.7500	33
34	2086.3	2079.2	0.0010	0.0116	1014.2	85.939	256.1	171.4	427.5	1.1899	1.7479	34
35	2139.2	2132.0	0.0010	0.0113	1008.6	88.506	257.9	169.5	427.5	1.1956	1.7458	35
36	2193.2	2185.7	0.0010	0.0110	1002.8	91.151	259.7	167.7	427.4	1.2013	1.7436	36
37	2248.1	2240.5	0.0010	0.0107	996.9	93.879	261.5	165.8	427.3	1.2070	1.7414	37
38	2304.2	2296.3	0.0010	0.0103	991.0	96.691	263.4	163.8	427.2	1.2127	1.7392	38
39	2361.2	2353.2	0.0010	0.0100	985.0	99.592	265.2	161.9	427.1	1.2185	1.7370	39
40	2419.3	2411.1	0.0010	0.0098	978.9	102.585	267.1	159.9	427.0	1.2243	1.7348	40
41	2478.5	2470.1	0.0010	0.0095	972.7	105.674	269.0	157.8	426.8	1.2301	1.7325	41
42	2538.8	2530.2	0.0010	0.0092	966.4	108.864	270.9	155.8	426.7	1.2359	1.7302	42
43	2600.1	2591.3	0.0010	0.0089	960.0	112.159	272.8	153.7	426.5	1.2418	1.7278	43
44	2662.6	2653.6	0.0011	0.0087	953.4	115.564	274.8	151.5	426.3	1.2477	1.7255	44
45	2726.1	2717.0	0.0011	0.0084	946.8	119.085	276.7	149.3	426.0	1.2537	1.7230	45
46	2790.9	2781.6	0.0011	0.0082	940.0	122.727	278.7	147.1	425.8	1.2597	1.7206	46
47	2856.7	2847.3	0.0011	0.0079	933.1	126.497	280.7	144.8	425.5	1.2658	1.7181	47
48	2923.8	2914.2	0.0011	0.0077	926.0	130.402	282.7	142.5	425.2	1.2719	1.7156	48
49	2991.9	2982.2	0.0011	0.0074	918.8	134.448	284.8	140.1	424.9	1.2781	1.7130	49
50	3061.3	3051.5	0.0011	0.0072	911.4	138.645	286.9	137.7	424.6	1.2843	1.7104	50
51	3131.9	3122.0	0.0011	0.0070	903.9	143.001	289.0	135.2	424.2	1.2906	1.7077	51
52	3203.7	3193.7	0.0011	0.0068	896.1	147.527	291.2	132.6	423.8	1.2971	1.7050	52
53	3276.7	3266.6	0.0011	0.0066	888.2	152.235	293.4	130.0	423.4	1.3036	1.7022	53
54	3351.0	3340.9	0.0011	0.0064	880.0	157.139	295.6	127.3	423.0	1.3102	1.6994	54
55	3426.5	3416.3	0.0012	0.0062	871.5	162.252	297.9	124.6	422.5	1.3169	1.6965	55
56	3503.3	3493.1	0.0012	0.0060	862.8	167.594	300.3	121.7	422.0	1.3238	1.6935	56
57	3581.3	3571.2	0.0012	0.0058	853.8	173.187	302.7	118.7	421.4	1.3308	1.6904	57
58	3660.7	3650.7	0.0012	0.0056	844.5	179.056	305.1	115.7	420.8	1.3380	1.6873	58
59	3741.3	3731.5	0.0012	0.0054	834.8	185.232	307.7	112.5	420.2	1.3453	1.6841	59
60	3823.3	3813.6	0.0012	0.0052	824.7	191.757	310.3	109.2	419.5	1.3529	1.6808	60
61	3906.6	3897.1	0.0012	0.0050	814.1	198.680	313.0	105.8	418.8	1.3608	1.6773	61
62	3991.2	3982.0	0.0013	0.0049	802.9	206.069	315.9	102.2	418.1	1.3689	1.6738	62
63	4077.2	4068.4	0.0013	0.0047	791.1	214.014	318.8	98.4	417.2	1.3774	1.6700	63
64	4164.5	4156.1	0.0013	0.0045	778.5	222.641	322.0	94.3	416.3	1.3863	1.6661	64
65	4253.2	4245.4	0.0013	0.0043	765.0	232.131	325.3	90.0	415.3	1.3958	1.6620	65
66	4343.3	4336.1	0.0013	0.0041	750.3	242.755	328.8	85.3	414.2	1.4059	1.6575	66
67	4434.7	4428.2	0.0014	0.0039	734.2	254.940	332.7	80.3	412.9	1.4168	1.6527	67
68	4527.6	4521.9	0.0014	0.0037	716.0	269.366	336.9	74.6	411.5	1.4289	1.6476	68
69	4621.8	4617.2	0.0014	0.0035	694.9	287.059	341.7	68.4	410.1	1.4425	1.6424	69
70	4717.5	4713.9	0.0015	0.0032	669.1	308.947	347.3	61.6	408.9	1.4586	1.6380	70

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	10.0			20.0			30.0			40.0			Temp [°C]
	-88.31 °C			-78.91 °C			-72.84 °C			-68.26 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	2.0972	381.4	2.1020	1.0953	386.8	2.0518	0.7491	390.2	2.0234	0.5721	392.7	2.0036	
-85	2.1363	383.5	2.1134										-85
-80	2.1951	386.8	2.1304										-80
-75	2.2538	390.1	2.1472	1.1188	389.4	2.0651							-75
-70	2.3123	393.4	2.1637	1.1487	392.7	2.0819	0.7607	392.1	2.0331				-70
-65	2.3707	396.7	2.1800	1.1784	396.2	2.0985	0.7810	395.6	2.0499	0.5822	395.0	2.0147	-65
-60	2.4290	400.1	2.1962	1.2081	399.6	2.1148	0.8011	399.0	2.0664	0.5976	398.5	2.0315	-60
-55	2.4872	403.6	2.2121	1.2377	403.1	2.1309	0.8211	402.6	2.0827	0.6129	402.0	2.0479	-55
-50	2.5453	407.0	2.2278	1.2672	406.6	2.1468	0.8411	406.1	2.0988	0.6280	405.6	2.0642	-50
-45	2.6033	410.5	2.2434	1.2966	410.1	2.1625	0.8609	409.7	2.1146	0.6431	409.2	2.0802	-45
-40	2.6613	414.1	2.2588	1.3259	413.7	2.1780	0.8807	413.3	2.1303	0.6581	412.9	2.0960	-40
-35	2.7192	417.7	2.2740	1.3551	417.3	2.1934	0.9005	416.9	2.1458	0.6731	416.6	2.1116	-35
-30	2.7770	421.3	2.2891	1.3844	421.0	2.2086	0.9201	420.6	2.1610	0.6880	420.3	2.1270	-30
-25	2.8348	425.0	2.3040	1.4135	424.7	2.2236	0.9397	424.3	2.1762	0.7028	424.0	2.1422	-25
-20	2.8926	428.7	2.3188	1.4426	428.4	2.2385	0.9593	428.1	2.1911	0.7176	427.8	2.1573	-20
-15	2.9503	432.4	2.3334	1.4717	432.2	2.2532	0.9788	431.9	2.2059	0.7324	431.6	2.1721	-15
-10	3.0079	436.2	2.3479	1.5007	436.0	2.2678	0.9983	435.7	2.2206	0.7471	435.4	2.1869	-10
-5	3.0656	440.0	2.3623	1.5297	439.8	2.2822	1.0178	439.5	2.2351	0.7618	439.3	2.2014	-5
0	3.1232	443.9	2.3766	1.5587	443.7	2.2966	1.0372	443.4	2.2495	0.7764	443.2	2.2159	0
5	3.1808	447.8	2.3908	1.5876	447.6	2.3108	1.0566	447.4	2.2637	0.7911	447.1	2.2302	5
10	3.2383	451.7	2.4048	1.6166	451.5	2.3248	1.0760	451.3	2.2779	0.8057	451.1	2.2444	10
15	3.2958	455.7	2.4187	1.6455	455.5	2.3388	1.0953	455.3	2.2919	0.8203	455.1	2.2584	15
20	3.3534	459.7	2.4325	1.6743	459.5	2.3527	1.1147	459.4	2.3057	0.8348	459.2	2.2723	20
25	3.4109	463.8	2.4462	1.7032	463.6	2.3664	1.1340	463.4	2.3195	0.8494	463.3	2.2861	25
30	3.4683	467.9	2.4598	1.7320	467.7	2.3800	1.1533	467.5	2.3332	0.8639	467.4	2.2998	30
35	3.5258	472.0	2.4733	1.7609	471.8	2.3936	1.1726	471.7	2.3468	0.8784	471.5	2.3134	35
40	3.5833	476.2	2.4868	1.7897	476.0	2.4070	1.1918	475.9	2.3602	0.8929	475.7	2.3269	40
45	3.6407	480.4	2.5001	1.8185	480.2	2.4204	1.2111	480.1	2.3736	0.9074	480.0	2.3403	45
50	3.6981	484.6	2.5133	1.8473	484.5	2.4336	1.2303	484.3	2.3869	0.9219	484.2	2.3536	50
55	3.7555	488.9	2.5264	1.8761	488.8	2.4468	1.2496	488.6	2.4000	0.9363	488.5	2.3668	55
60	3.8130	493.2	2.5395	1.9048	493.1	2.4598	1.2688	493.0	2.4131	0.9508	492.8	2.3799	60
65	3.8704	497.6	2.5524	1.9336	497.4	2.4728	1.2880	497.3	2.4261	0.9652	497.2	2.3929	65
70				1.9624	501.8	2.4857	1.3072	501.7	2.4390	0.9797	501.6	2.4058	70
75				1.9911	506.3	2.4985	1.3264	506.2	2.4518	0.9941	506.1	2.4187	75
80							1.3456	510.6	2.4646	1.0085	510.5	2.4314	80
85										1.0229	515.0	2.4441	85

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	50.0			60.0			70.0			80.0			Temp [°C]
	-64.52 °C			-61.34 °C			-58.56 °C			-56.09 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.4641	394.7	1.9885	0.3911	396.4	1.9764	0.3384	397.9	1.9662	0.2985	399.1	1.9574	
-60	0.4754	397.9	2.0039	0.3940	397.4	1.9810							-60
-55	0.4879	401.5	2.0206	0.4045	401.0	1.9979	0.3449	400.5	1.9783	0.3003	400.0	1.9612	-55
-50	0.5002	405.2	2.0370	0.4149	404.7	2.0145	0.3540	404.2	1.9951	0.3083	403.7	1.9782	-50
-45	0.5124	408.8	2.0532	0.4253	408.4	2.0308	0.3630	407.9	2.0116	0.3163	407.5	1.9948	-45
-40	0.5246	412.5	2.0691	0.4355	412.1	2.0469	0.3719	411.7	2.0279	0.3242	411.2	2.0112	-40
-35	0.5367	416.2	2.0848	0.4457	415.8	2.0627	0.3807	415.4	2.0438	0.3320	415.0	2.0273	-35
-30	0.5487	419.9	2.1003	0.4558	419.6	2.0783	0.3895	419.2	2.0596	0.3397	418.9	2.0431	-30
-25	0.5607	423.7	2.1156	0.4659	423.4	2.0937	0.3982	423.0	2.0751	0.3474	422.7	2.0588	-25
-20	0.5726	427.5	2.1308	0.4759	427.2	2.1090	0.4069	426.9	2.0904	0.3551	426.5	2.0742	-20
-15	0.5845	431.3	2.1457	0.4859	431.0	2.1240	0.4155	430.7	2.1055	0.3627	430.4	2.0894	-15
-10	0.5964	435.2	2.1605	0.4959	434.9	2.1389	0.4241	434.6	2.1205	0.3703	434.3	2.1044	-10
-5	0.6082	439.0	2.1752	0.5058	438.8	2.1536	0.4327	438.5	2.1352	0.3778	438.3	2.1192	-5
0	0.6200	443.0	2.1897	0.5157	442.7	2.1681	0.4412	442.5	2.1498	0.3853	442.3	2.1339	0
5	0.6318	446.9	2.2040	0.5255	446.7	2.1825	0.4497	446.5	2.1643	0.3928	446.3	2.1484	5
10	0.6435	450.9	2.2182	0.5354	450.7	2.1968	0.4581	450.5	2.1786	0.4002	450.3	2.1628	10
15	0.6552	454.9	2.2323	0.5452	454.7	2.2109	0.4666	454.5	2.1928	0.4076	454.4	2.1770	15
20	0.6669	459.0	2.2463	0.5550	458.8	2.2250	0.4750	458.6	2.2068	0.4150	458.4	2.1911	20
25	0.6786	463.1	2.2601	0.5647	462.9	2.2388	0.4834	462.7	2.2207	0.4224	462.6	2.2050	25
30	0.6903	467.2	2.2739	0.5745	467.1	2.2526	0.4918	466.9	2.2345	0.4298	466.7	2.2188	30
35	0.7019	471.4	2.2875	0.5842	471.2	2.2662	0.5002	471.1	2.2482	0.4371	470.9	2.2325	35
40	0.7135	475.6	2.3010	0.5940	475.4	2.2798	0.5085	475.3	2.2618	0.4445	475.1	2.2461	40
45	0.7252	479.8	2.3144	0.6037	479.7	2.2932	0.5169	479.5	2.2752	0.4518	479.4	2.2596	45
50	0.7368	484.1	2.3277	0.6134	483.9	2.3065	0.5252	483.8	2.2886	0.4591	483.7	2.2730	50
55	0.7484	488.4	2.3409	0.6231	488.3	2.3198	0.5336	488.1	2.3018	0.4664	488.0	2.2863	55
60	0.7600	492.7	2.3541	0.6327	492.6	2.3329	0.5419	492.5	2.3150	0.4737	492.4	2.2994	60
65	0.7715	497.1	2.3671	0.6424	497.0	2.3460	0.5502	496.9	2.3281	0.4810	496.7	2.3125	65
70	0.7831	501.5	2.3800	0.6521	501.4	2.3589	0.5585	501.3	2.3410	0.4883	501.2	2.3255	70
75	0.7947	505.9	2.3929	0.6617	505.8	2.3718	0.5668	505.7	2.3539	0.4956	505.6	2.3384	75
80	0.8062	510.4	2.4057	0.6714	510.3	2.3846	0.5751	510.2	2.3667	0.5028	510.1	2.3512	80
85	0.8178	514.9	2.4183	0.6810	514.8	2.3973	0.5834	514.7	2.3794	0.5101	514.6	2.3639	85
90	0.8294	519.5	2.4309	0.6907	519.4	2.4099	0.5916	519.3	2.3920	0.5174	519.2	2.3766	90
95							0.5999	523.9	2.4046	0.5246	523.8	2.3891	95

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													Temp [°C]
Temp [°C]	90.0			100.0			101.325			110.0			
	-53.84 °C			-51.79 °C			-51.53 °C			-49.90 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.2672	400.3	1.9498	0.2420	401.3	1.9430	0.2390	401.5	1.9421	0.2212	402.3	1.9369	
-50	0.2728	403.2	1.9630	0.2443	402.7	1.9492	0.2410	402.7	1.9474				-50
-45	0.2800	407.0	1.9798	0.2509	406.6	1.9662	0.2475	406.5	1.9645	0.2271	406.1	1.9537	-45
-40	0.2870	410.8	1.9963	0.2573	410.4	1.9828	0.2538	410.3	1.9811	0.2330	410.0	1.9705	-40
-35	0.2941	414.6	2.0125	0.2637	414.3	1.9992	0.2602	414.2	1.9975	0.2389	413.9	1.9870	-35
-30	0.3010	418.5	2.0285	0.2701	418.1	2.0153	0.2664	418.1	2.0136	0.2447	417.8	2.0032	-30
-25	0.3079	422.4	2.0442	0.2763	422.0	2.0311	0.2726	422.0	2.0295	0.2505	421.7	2.0192	-25
-20	0.3148	426.2	2.0597	0.2826	425.9	2.0467	0.2788	425.9	2.0451	0.2562	425.6	2.0349	-20
-15	0.3216	430.1	2.0750	0.2887	429.9	2.0621	0.2849	429.8	2.0605	0.2618	429.6	2.0503	-15
-10	0.3284	434.1	2.0901	0.2949	433.8	2.0773	0.2909	433.8	2.0756	0.2675	433.5	2.0655	-10
-5	0.3351	438.0	2.1050	0.3010	437.8	2.0922	0.2970	437.7	2.0906	0.2730	437.5	2.0806	-5
0	0.3418	442.0	2.1197	0.3071	441.8	2.1070	0.3030	441.8	2.1054	0.2786	441.5	2.0954	0
5	0.3485	446.0	2.1343	0.3131	445.8	2.1216	0.3089	445.8	2.1200	0.2841	445.6	2.1101	5
10	0.3552	450.1	2.1487	0.3191	449.9	2.1361	0.3149	449.8	2.1345	0.2896	449.7	2.1246	10
15	0.3618	454.2	2.1630	0.3251	454.0	2.1504	0.3208	453.9	2.1488	0.2951	453.8	2.1390	15
20	0.3684	458.3	2.1771	0.3311	458.1	2.1646	0.3267	458.0	2.1630	0.3005	457.9	2.1532	20
25	0.3750	462.4	2.1911	0.3370	462.2	2.1786	0.3326	462.2	2.1770	0.3060	462.0	2.1672	25
30	0.3816	466.6	2.2049	0.3430	466.4	2.1925	0.3384	466.4	2.1909	0.3114	466.2	2.1811	30
35	0.3881	470.8	2.2187	0.3489	470.6	2.2062	0.3443	470.6	2.2047	0.3168	470.4	2.1949	35
40	0.3947	475.0	2.2323	0.3548	474.8	2.2199	0.3501	474.8	2.2183	0.3222	474.7	2.2086	40
45	0.4012	479.3	2.2458	0.3607	479.1	2.2334	0.3559	479.1	2.2319	0.3276	479.0	2.2222	45
50	0.4077	483.5	2.2592	0.3666	483.4	2.2468	0.3617	483.4	2.2453	0.3329	483.3	2.2356	50
55	0.4142	487.9	2.2725	0.3725	487.7	2.2601	0.3675	487.7	2.2586	0.3383	487.6	2.2489	55
60	0.4207	492.2	2.2857	0.3783	492.1	2.2733	0.3733	492.1	2.2718	0.3436	492.0	2.2622	60
65	0.4272	496.6	2.2988	0.3842	496.5	2.2865	0.3791	496.5	2.2849	0.3490	496.4	2.2753	65
70	0.4337	501.1	2.3118	0.3900	501.0	2.2995	0.3849	500.9	2.2979	0.3543	500.8	2.2883	70
75	0.4402	505.5	2.3247	0.3959	505.4	2.3124	0.3907	505.4	2.3109	0.3596	505.3	2.3013	75
80	0.4467	510.0	2.3375	0.4017	509.9	2.3252	0.3964	509.9	2.3237	0.3649	509.8	2.3141	80
85	0.4531	514.5	2.3502	0.4075	514.4	2.3380	0.4022	514.4	2.3364	0.3702	514.4	2.3268	85
90	0.4596	519.1	2.3629	0.4134	519.0	2.3506	0.4079	519.0	2.3491	0.3755	518.9	2.3395	90
95	0.4660	523.7	2.3754	0.4192	523.6	2.3632	0.4137	523.6	2.3617	0.3808	523.5	2.3521	95
100	0.4725	528.3	2.3879	0.4250	528.2	2.3757	0.4194	528.2	2.3742	0.3861	528.2	2.3646	100
105										0.3914	532.8	2.3770	105

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													Temp [°C]
Temp [°C]	120.0			130.0			140.0			150.0			
	-48.13 °C			-46.48 °C			-44.93 °C			-43.46 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.2037	403.2	1.9313	0.1889	404.0	1.9262	0.1761	404.7	1.9215	0.1650	405.5	1.9172	
-45	0.2072	405.6	1.9421	0.1904	405.2	1.9314							-45
-40	0.2128	409.5	1.9591	0.1956	409.1	1.9485	0.1809	408.7	1.9386	0.1681	408.2	1.9292	-40
-35	0.2182	413.5	1.9758	0.2007	413.1	1.9653	0.1857	412.7	1.9555	0.1727	412.3	1.9463	-35
-30	0.2236	417.4	1.9921	0.2057	417.0	1.9818	0.1904	416.7	1.9721	0.1771	416.3	1.9630	-30
-25	0.2289	421.3	2.0082	0.2107	421.0	1.9979	0.1950	420.7	1.9884	0.1815	420.3	1.9794	-25
-20	0.2342	425.3	2.0239	0.2156	425.0	2.0138	0.1996	424.7	2.0044	0.1858	424.3	1.9955	-20
-15	0.2394	429.3	2.0395	0.2205	429.0	2.0294	0.2042	428.7	2.0201	0.1901	428.4	2.0113	-15
-10	0.2446	433.3	2.0548	0.2253	433.0	2.0448	0.2087	432.7	2.0355	0.1943	432.4	2.0268	-10
-5	0.2498	437.3	2.0699	0.2301	437.0	2.0600	0.2132	436.8	2.0508	0.1985	436.5	2.0421	-5
0	0.2549	441.3	2.0848	0.2348	441.1	2.0750	0.2176	440.8	2.0658	0.2027	440.6	2.0572	0
5	0.2600	445.4	2.0995	0.2395	445.1	2.0898	0.2220	444.9	2.0807	0.2068	444.7	2.0721	5
10	0.2650	449.5	2.1141	0.2442	449.2	2.1044	0.2264	449.0	2.0953	0.2110	448.8	2.0868	10
15	0.2701	453.6	2.1285	0.2489	453.4	2.1188	0.2308	453.2	2.1098	0.2151	453.0	2.1014	15
20	0.2751	457.7	2.1427	0.2536	457.5	2.1331	0.2351	457.3	2.1241	0.2191	457.1	2.1157	20
25	0.2801	461.9	2.1568	0.2582	461.7	2.1472	0.2394	461.5	2.1383	0.2232	461.3	2.1299	25
30	0.2851	466.1	2.1708	0.2628	465.9	2.1612	0.2437	465.7	2.1523	0.2272	465.6	2.1440	30
35	0.2901	470.3	2.1846	0.2674	470.1	2.1750	0.2480	470.0	2.1662	0.2312	469.8	2.1579	35
40	0.2950	474.5	2.1983	0.2720	474.4	2.1888	0.2523	474.2	2.1799	0.2352	474.1	2.1717	40
45	0.3000	478.8	2.2119	0.2766	478.7	2.2024	0.2566	478.5	2.1936	0.2392	478.4	2.1853	45
50	0.3049	483.1	2.2253	0.2812	483.0	2.2159	0.2608	482.9	2.2071	0.2432	482.7	2.1988	50
55	0.3098	487.5	2.2387	0.2857	487.4	2.2292	0.2651	487.2	2.2205	0.2472	487.1	2.2123	55
60	0.3147	491.9	2.2519	0.2903	491.8	2.2425	0.2693	491.6	2.2337	0.2511	491.5	2.2256	60
65	0.3196	496.3	2.2651	0.2948	496.2	2.2556	0.2735	496.1	2.2469	0.2551	495.9	2.2388	65
70	0.3245	500.7	2.2781	0.2993	500.6	2.2687	0.2777	500.5	2.2600	0.2590	500.4	2.2518	70
75	0.3294	505.2	2.2911	0.3038	505.1	2.2817	0.2819	505.0	2.2730	0.2629	504.9	2.2648	75
80	0.3343	509.7	2.3039	0.3083	509.6	2.2945	0.2861	509.5	2.2858	0.2669	509.4	2.2777	80
85	0.3392	514.3	2.3167	0.3129	514.2	2.3073	0.2903	514.1	2.2986	0.2708	514.0	2.2905	85
90	0.3440	518.8	2.3294	0.3174	518.7	2.3200	0.2945	518.6	2.3113	0.2747	518.5	2.3032	90
95	0.3489	523.4	2.3420	0.3219	523.3	2.3326	0.2987	523.3	2.3240	0.2786	523.2	2.3159	95
100	0.3537	528.1	2.3545	0.3263	528.0	2.3451	0.3029	527.9	2.3365	0.2825	527.8	2.3284	100
105	0.3586	532.7	2.3669	0.3308	532.7	2.3576	0.3070	532.6	2.3489	0.2864	532.5	2.3409	105
110							0.3112	537.3	2.3613	0.2903	537.2	2.3533	110

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													Temp [°C]
Temp [°C]	160.0			170.0			180.0			190.0			
	-42.07 °C			-40.74 °C			-39.47 °C			-38.26 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1552	406.1	1.9131	0.1465	406.7	1.9093	0.1388	407.3	1.9058	0.1318	407.9	1.9024	
-40	0.1570	407.8	1.9204	0.1471	407.4	1.9119							-40
-35	0.1613	411.9	1.9376	0.1512	411.4	1.9293	0.1423	411.0	1.9214	0.1342	410.6	1.9139	-35
-30	0.1655	415.9	1.9544	0.1552	415.5	1.9463	0.1461	415.1	1.9385	0.1379	414.8	1.9311	-30
-25	0.1696	420.0	1.9709	0.1591	419.6	1.9629	0.1498	419.3	1.9553	0.1415	418.9	1.9480	-25
-20	0.1737	424.0	1.9871	0.1630	423.7	1.9792	0.1535	423.4	1.9716	0.1450	423.0	1.9645	-20
-15	0.1778	428.1	2.0030	0.1669	427.8	1.9952	0.1572	427.5	1.9877	0.1485	427.2	1.9806	-15
-10	0.1818	432.2	2.0186	0.1707	431.9	2.0109	0.1608	431.6	2.0035	0.1520	431.3	1.9965	-10
-5	0.1857	436.2	2.0340	0.1744	436.0	2.0263	0.1644	435.7	2.0190	0.1554	435.5	2.0121	-5
0	0.1897	440.3	2.0492	0.1781	440.1	2.0416	0.1679	439.9	2.0343	0.1588	439.6	2.0274	0
5	0.1936	444.5	2.0641	0.1818	444.2	2.0566	0.1714	444.0	2.0494	0.1621	443.8	2.0426	5
10	0.1974	448.6	2.0789	0.1855	448.4	2.0714	0.1749	448.2	2.0642	0.1654	448.0	2.0575	10
15	0.2013	452.8	2.0934	0.1892	452.6	2.0860	0.1784	452.4	2.0789	0.1687	452.2	2.0722	15
20	0.2051	456.9	2.1078	0.1928	456.8	2.1004	0.1818	456.6	2.0934	0.1720	456.4	2.0867	20
25	0.2089	461.2	2.1221	0.1964	461.0	2.1147	0.1852	460.8	2.1077	0.1752	460.6	2.1011	25
30	0.2127	465.4	2.1362	0.2000	465.2	2.1288	0.1886	465.1	2.1219	0.1784	464.9	2.1152	30
35	0.2165	469.7	2.1501	0.2035	469.5	2.1428	0.1920	469.3	2.1359	0.1817	469.2	2.1293	35
40	0.2203	473.9	2.1639	0.2071	473.8	2.1566	0.1954	473.6	2.1497	0.1849	473.5	2.1432	40
45	0.2240	478.3	2.1776	0.2106	478.1	2.1703	0.1987	478.0	2.1634	0.1880	477.8	2.1569	45
50	0.2278	482.6	2.1911	0.2141	482.5	2.1839	0.2020	482.3	2.1770	0.1912	482.2	2.1705	50
55	0.2315	487.0	2.2046	0.2177	486.9	2.1973	0.2054	486.7	2.1905	0.1944	486.6	2.1840	55
60	0.2352	491.4	2.2179	0.2212	491.3	2.2107	0.2087	491.1	2.2039	0.1975	491.0	2.1974	60
65	0.2389	495.8	2.2311	0.2247	495.7	2.2239	0.2120	495.6	2.2171	0.2007	495.5	2.2107	65
70	0.2426	500.3	2.2442	0.2282	500.2	2.2370	0.2153	500.1	2.2303	0.2038	499.9	2.2238	70
75	0.2463	504.8	2.2572	0.2317	504.7	2.2501	0.2186	504.6	2.2433	0.2070	504.5	2.2369	75
80	0.2500	509.3	2.2701	0.2351	509.2	2.2630	0.2219	509.1	2.2562	0.2101	509.0	2.2498	80
85	0.2537	513.9	2.2829	0.2386	513.8	2.2758	0.2252	513.7	2.2691	0.2132	513.6	2.2627	85
90	0.2574	518.5	2.2957	0.2421	518.4	2.2885	0.2285	518.3	2.2818	0.2163	518.2	2.2754	90
95	0.2610	523.1	2.3083	0.2455	523.0	2.3012	0.2317	522.9	2.2945	0.2194	522.8	2.2881	95
100	0.2647	527.7	2.3209	0.2490	527.6	2.3137	0.2350	527.5	2.3070	0.2225	527.5	2.3007	100
105	0.2684	532.4	2.3333	0.2524	532.3	2.3262	0.2383	532.2	2.3195	0.2256	532.2	2.3132	105
110	0.2720	537.1	2.3457	0.2559	537.0	2.3386	0.2415	537.0	2.3319	0.2287	536.9	2.3256	110
115							0.2448	541.7	2.3442	0.2318	541.6	2.3379	115

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	200.0			210.0			220.0			230.0			Temp [°C]
	-37.09 °C			-35.97 °C			-34.89 °C			-33.85 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1255	408.4	1.8992	0.1198	409.0	1.8962	0.1146	409.4	1.8933	0.1099	409.9	1.8906	
-35	0.1270	410.2	1.9066	0.1205	409.8	1.8997							-35
-30	0.1306	414.4	1.9240	0.1239	414.0	1.9172	0.1178	413.6	1.9106	0.1123	413.2	1.9043	-30
-25	0.1340	418.5	1.9410	0.1272	418.2	1.9343	0.1210	417.8	1.9278	0.1154	417.5	1.9216	-25
-20	0.1374	422.7	1.9576	0.1305	422.4	1.9510	0.1242	422.0	1.9446	0.1184	421.7	1.9385	-20
-15	0.1407	426.9	1.9738	0.1337	426.6	1.9673	0.1273	426.3	1.9611	0.1214	425.9	1.9551	-15
-10	0.1440	431.0	1.9898	0.1368	430.7	1.9834	0.1303	430.5	1.9772	0.1243	430.2	1.9713	-10
-5	0.1473	435.2	2.0055	0.1400	434.9	1.9991	0.1333	434.7	1.9930	0.1272	434.4	1.9872	-5
0	0.1505	439.4	2.0209	0.1431	439.1	2.0146	0.1363	438.9	2.0086	0.1301	438.6	2.0028	0
5	0.1537	443.5	2.0361	0.1461	443.3	2.0298	0.1392	443.1	2.0239	0.1329	442.8	2.0182	5
10	0.1569	447.7	2.0510	0.1491	447.5	2.0449	0.1421	447.3	2.0390	0.1357	447.1	2.0333	10
15	0.1600	452.0	2.0658	0.1521	451.8	2.0597	0.1450	451.6	2.0538	0.1385	451.3	2.0482	15
20	0.1631	456.2	2.0803	0.1551	456.0	2.0743	0.1479	455.8	2.0685	0.1412	455.6	2.0629	20
25	0.1662	460.4	2.0947	0.1581	460.3	2.0887	0.1507	460.1	2.0829	0.1439	459.9	2.0774	25
30	0.1693	464.7	2.1090	0.1610	464.6	2.1030	0.1535	464.4	2.0972	0.1466	464.2	2.0917	30
35	0.1724	469.0	2.1230	0.1640	468.9	2.1170	0.1563	468.7	2.1113	0.1493	468.5	2.1058	35
40	0.1754	473.3	2.1369	0.1669	473.2	2.1310	0.1591	473.0	2.1253	0.1520	472.9	2.1198	40
45	0.1785	477.7	2.1507	0.1698	477.5	2.1448	0.1619	477.4	2.1391	0.1547	477.3	2.1337	45
50	0.1815	482.1	2.1644	0.1727	481.9	2.1585	0.1647	481.8	2.1528	0.1573	481.7	2.1474	50
55	0.1845	486.5	2.1779	0.1755	486.3	2.1720	0.1674	486.2	2.1664	0.1600	486.1	2.1610	55
60	0.1875	490.9	2.1913	0.1784	490.8	2.1854	0.1701	490.6	2.1798	0.1626	490.5	2.1744	60
65	0.1905	495.3	2.2045	0.1813	495.2	2.1987	0.1729	495.1	2.1931	0.1652	495.0	2.1878	65
70	0.1935	499.8	2.2177	0.1841	499.7	2.2119	0.1756	499.6	2.2063	0.1678	499.5	2.2010	70
75	0.1965	504.3	2.2308	0.1870	504.2	2.2250	0.1783	504.1	2.2194	0.1704	504.0	2.2141	75
80	0.1994	508.9	2.2437	0.1898	508.8	2.2379	0.1810	508.7	2.2324	0.1730	508.6	2.2271	80
85	0.2024	513.5	2.2566	0.1926	513.4	2.2508	0.1837	513.3	2.2453	0.1756	513.2	2.2400	85
90	0.2054	518.1	2.2694	0.1955	518.0	2.2636	0.1864	517.9	2.2581	0.1782	517.8	2.2528	90
95	0.2083	522.7	2.2820	0.1983	522.6	2.2763	0.1891	522.5	2.2708	0.1808	522.4	2.2655	95
100	0.2113	527.4	2.2946	0.2011	527.3	2.2889	0.1918	527.2	2.2834	0.1834	527.1	2.2781	100
105	0.2142	532.1	2.3071	0.2039	532.0	2.3014	0.1945	531.9	2.2959	0.1860	531.8	2.2906	105
110	0.2171	536.8	2.3195	0.2067	536.7	2.3138	0.1972	536.6	2.3083	0.1885	536.6	2.3031	110
115	0.2201	541.6	2.3319	0.2095	541.5	2.3261	0.1999	541.4	2.3207	0.1911	541.3	2.3154	115
120							0.2026	546.2	2.3329	0.1936	546.1	2.3277	120

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													Temp [°C]
Temp [°C]	240.0			250.0			260.0			270.0			
	-32.84 °C			-31.87 °C			-30.92 °C			-30.01 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.1055	410.4	1.8880	0.1015	410.8	1.8854	0.0977	411.2	1.8830	0.0943	411.6	1.8807	
-30	0.1072	412.8	1.8981	0.1026	412.4	1.8922	0.0983	412.0	1.8864	0.0943	411.6	1.8807	-30
-25	0.1102	417.1	1.9156	0.1055	416.7	1.9098	0.1011	416.4	1.9041	0.0970	416.0	1.8986	-25
-20	0.1132	421.4	1.9326	0.1083	421.0	1.9269	0.1038	420.7	1.9214	0.0997	420.4	1.9160	-20
-15	0.1160	425.6	1.9493	0.1111	425.3	1.9437	0.1065	425.0	1.9382	0.1023	424.7	1.9330	-15
-10	0.1189	429.9	1.9656	0.1138	429.6	1.9601	0.1092	429.3	1.9547	0.1049	429.0	1.9495	-10
-5	0.1216	434.1	1.9815	0.1165	433.9	1.9761	0.1118	433.6	1.9708	0.1074	433.3	1.9657	-5
0	0.1244	438.4	1.9972	0.1192	438.1	1.9919	0.1144	437.9	1.9867	0.1099	437.6	1.9816	0
5	0.1271	442.6	2.0126	0.1218	442.4	2.0073	0.1169	442.1	2.0022	0.1123	441.9	1.9972	5
10	0.1298	446.9	2.0278	0.1244	446.7	2.0226	0.1194	446.4	2.0175	0.1148	446.2	2.0126	10
15	0.1325	451.1	2.0428	0.1270	450.9	2.0376	0.1219	450.7	2.0325	0.1172	450.5	2.0277	15
20	0.1351	455.4	2.0575	0.1295	455.2	2.0523	0.1244	455.0	2.0473	0.1196	454.8	2.0425	20
25	0.1377	459.7	2.0720	0.1321	459.5	2.0669	0.1268	459.4	2.0620	0.1219	459.2	2.0572	25
30	0.1404	464.0	2.0864	0.1346	463.9	2.0813	0.1292	463.7	2.0764	0.1243	463.5	2.0716	30
35	0.1429	468.4	2.1006	0.1371	468.2	2.0955	0.1316	468.1	2.0906	0.1266	467.9	2.0859	35
40	0.1455	472.7	2.1146	0.1395	472.6	2.1096	0.1340	472.4	2.1047	0.1289	472.3	2.1000	40
45	0.1481	477.1	2.1285	0.1420	477.0	2.1235	0.1364	476.8	2.1186	0.1312	476.7	2.1140	45
50	0.1506	481.5	2.1422	0.1445	481.4	2.1372	0.1388	481.2	2.1324	0.1335	481.1	2.1278	50
55	0.1532	485.9	2.1558	0.1469	485.8	2.1509	0.1411	485.7	2.1461	0.1358	485.6	2.1415	55
60	0.1557	490.4	2.1693	0.1493	490.3	2.1643	0.1435	490.1	2.1596	0.1380	490.0	2.1550	60
65	0.1582	494.9	2.1826	0.1517	494.8	2.1777	0.1458	494.6	2.1730	0.1403	494.5	2.1684	65
70	0.1607	499.4	2.1959	0.1542	499.3	2.1910	0.1481	499.2	2.1862	0.1425	499.0	2.1817	70
75	0.1632	503.9	2.2090	0.1566	503.8	2.2041	0.1504	503.7	2.1994	0.1448	503.6	2.1948	75
80	0.1657	508.5	2.2220	0.1590	508.4	2.2171	0.1527	508.3	2.2124	0.1470	508.2	2.2079	80
85	0.1682	513.1	2.2349	0.1614	513.0	2.2300	0.1551	512.9	2.2253	0.1492	512.8	2.2208	85
90	0.1707	517.7	2.2477	0.1638	517.6	2.2429	0.1574	517.5	2.2382	0.1514	517.4	2.2337	90
95	0.1732	522.3	2.2604	0.1661	522.3	2.2556	0.1596	522.2	2.2509	0.1536	522.1	2.2464	95
100	0.1756	527.0	2.2731	0.1685	526.9	2.2682	0.1619	526.8	2.2636	0.1558	526.8	2.2591	100
105	0.1781	531.7	2.2856	0.1709	531.6	2.2808	0.1642	531.6	2.2761	0.1581	531.5	2.2716	105
110	0.1806	536.5	2.2980	0.1733	536.4	2.2932	0.1665	536.3	2.2886	0.1603	536.2	2.2841	110
115	0.1830	541.2	2.3104	0.1756	541.2	2.3056	0.1688	541.1	2.3010	0.1624	541.0	2.2965	115
120	0.1855	546.0	2.3227	0.1780	546.0	2.3179	0.1711	545.9	2.3133	0.1646	545.8	2.3088	120

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	280.0			290.0			300.0			310.0			Temp [°C]
	-29.12 °C			-28.25 °C			-27.40 °C			-26.58 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0910	412.0	1.8785	0.0880	412.4	1.8764	0.0852	412.7	1.8743	0.0825	413.1	1.8723	
-25	0.0932	415.6	1.8933	0.0897	415.2	1.8881	0.0864	414.9	1.8830	0.0833	414.5	1.8781	-25
-20	0.0958	420.0	1.9108	0.0922	419.7	1.9057	0.0889	419.3	1.9008	0.0857	419.0	1.8959	-20
-15	0.0984	424.4	1.9279	0.0947	424.0	1.9229	0.0913	423.7	1.9180	0.0881	423.4	1.9133	-15
-10	0.1009	428.7	1.9445	0.0971	428.4	1.9396	0.0937	428.1	1.9349	0.0904	427.8	1.9302	-10
-5	0.1033	433.0	1.9608	0.0995	432.8	1.9560	0.0960	432.5	1.9513	0.0927	432.2	1.9468	-5
0	0.1057	437.4	1.9768	0.1019	437.1	1.9720	0.0983	436.8	1.9674	0.0949	436.6	1.9629	0
5	0.1081	441.7	1.9924	0.1042	441.4	1.9877	0.1005	441.2	1.9832	0.0971	441.0	1.9788	5
10	0.1105	446.0	2.0078	0.1065	445.8	2.0032	0.1027	445.5	1.9987	0.0992	445.3	1.9944	10
15	0.1128	450.3	2.0229	0.1087	450.1	2.0184	0.1049	449.9	2.0140	0.1014	449.7	2.0096	15
20	0.1151	454.6	2.0379	0.1110	454.5	2.0333	0.1071	454.3	2.0289	0.1035	454.1	2.0247	20
25	0.1174	459.0	2.0526	0.1132	458.8	2.0481	0.1093	458.6	2.0437	0.1056	458.4	2.0395	25
30	0.1197	463.4	2.0670	0.1154	463.2	2.0626	0.1114	463.0	2.0583	0.1077	462.8	2.0541	30
35	0.1219	467.7	2.0814	0.1176	467.6	2.0769	0.1135	467.4	2.0727	0.1097	467.2	2.0685	35
40	0.1242	472.1	2.0955	0.1197	472.0	2.0911	0.1156	471.8	2.0869	0.1117	471.7	2.0827	40
45	0.1264	476.5	2.1095	0.1219	476.4	2.1051	0.1177	476.2	2.1009	0.1138	476.1	2.0968	45
50	0.1286	481.0	2.1233	0.1240	480.8	2.1190	0.1198	480.7	2.1148	0.1158	480.6	2.1107	50
55	0.1308	485.4	2.1370	0.1261	485.3	2.1327	0.1218	485.2	2.1285	0.1178	485.0	2.1244	55
60	0.1330	489.9	2.1505	0.1283	489.8	2.1462	0.1239	489.7	2.1421	0.1198	489.5	2.1381	60
65	0.1351	494.4	2.1640	0.1304	494.3	2.1597	0.1259	494.2	2.1555	0.1218	494.0	2.1515	65
70	0.1373	498.9	2.1772	0.1325	498.8	2.1730	0.1280	498.7	2.1689	0.1237	498.6	2.1649	70
75	0.1395	503.5	2.1904	0.1346	503.4	2.1862	0.1300	503.3	2.1821	0.1257	503.2	2.1781	75
80	0.1416	508.1	2.2035	0.1366	508.0	2.1993	0.1320	507.9	2.1952	0.1276	507.8	2.1912	80
85	0.1438	512.7	2.2164	0.1387	512.6	2.2122	0.1340	512.5	2.2081	0.1296	512.4	2.2042	85
90	0.1459	517.3	2.2293	0.1408	517.2	2.2251	0.1360	517.1	2.2210	0.1315	517.0	2.2171	90
95	0.1481	522.0	2.2421	0.1429	521.9	2.2379	0.1380	521.8	2.2338	0.1335	521.7	2.2299	95
100	0.1502	526.7	2.2547	0.1449	526.6	2.2505	0.1400	526.5	2.2465	0.1354	526.4	2.2426	100
105	0.1523	531.4	2.2673	0.1470	531.3	2.2631	0.1420	531.2	2.2591	0.1373	531.1	2.2552	105
110	0.1544	536.1	2.2798	0.1490	536.1	2.2756	0.1440	536.0	2.2716	0.1393	535.9	2.2677	110
115	0.1566	540.9	2.2922	0.1511	540.8	2.2880	0.1460	540.8	2.2840	0.1412	540.7	2.2801	115
120	0.1587	545.7	2.3045	0.1531	545.7	2.3003	0.1480	545.6	2.2963	0.1431	545.5	2.2924	120
125	0.1608	550.6	2.3167	0.1552	550.5	2.3126	0.1499	550.4	2.3086	0.1450	550.4	2.3047	125

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													Temp [°C]
Temp [°C]	320.0			330.0			340.0			350.0			
	-25.78 °C			-24.99 °C			-24.23 °C			-23.48 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0800	413.4	1.8703	0.0777	413.7	1.8685	0.0755	414.0	1.8667	0.0734	414.3	1.8649	
-25	0.0804	414.1	1.8732										-25
-20	0.0828	418.6	1.8912	0.0800	418.3	1.8866	0.0774	417.9	1.8821	0.0750	417.5	1.8776	-20
-15	0.0851	423.1	1.9087	0.0823	422.8	1.9042	0.0796	422.4	1.8998	0.0771	422.1	1.8955	-15
-10	0.0873	427.5	1.9257	0.0845	427.2	1.9213	0.0818	426.9	1.9170	0.0792	426.6	1.9128	-10
-5	0.0896	431.9	1.9423	0.0866	431.7	1.9380	0.0839	431.4	1.9338	0.0813	431.1	1.9297	-5
0	0.0917	436.3	1.9586	0.0888	436.1	1.9543	0.0860	435.8	1.9502	0.0833	435.5	1.9461	0
5	0.0939	440.7	1.9745	0.0908	440.5	1.9703	0.0880	440.2	1.9662	0.0853	440.0	1.9622	5
10	0.0960	445.1	1.9901	0.0929	444.9	1.9860	0.0900	444.6	1.9820	0.0873	444.4	1.9780	10
15	0.0980	449.5	2.0055	0.0949	449.3	2.0014	0.0920	449.1	1.9974	0.0892	448.8	1.9935	15
20	0.1001	453.9	2.0205	0.0969	453.7	2.0165	0.0939	453.5	2.0126	0.0911	453.3	2.0088	20
25	0.1021	458.3	2.0354	0.0989	458.1	2.0314	0.0958	457.9	2.0275	0.0930	457.7	2.0237	25
30	0.1041	462.7	2.0500	0.1009	462.5	2.0461	0.0978	462.3	2.0422	0.0948	462.1	2.0385	30
35	0.1061	467.1	2.0645	0.1028	466.9	2.0606	0.0996	466.7	2.0567	0.0967	466.6	2.0530	35
40	0.1081	471.5	2.0787	0.1047	471.3	2.0749	0.1015	471.2	2.0711	0.0985	471.0	2.0674	40
45	0.1101	475.9	2.0928	0.1066	475.8	2.0890	0.1034	475.7	2.0852	0.1003	475.5	2.0815	45
50	0.1120	480.4	2.1067	0.1085	480.3	2.1029	0.1052	480.1	2.0992	0.1021	480.0	2.0955	50
55	0.1140	484.9	2.1205	0.1104	484.8	2.1167	0.1071	484.6	2.1130	0.1039	484.5	2.1094	55
60	0.1159	489.4	2.1341	0.1123	489.3	2.1303	0.1089	489.1	2.1266	0.1057	489.0	2.1230	60
65	0.1178	493.9	2.1476	0.1142	493.8	2.1438	0.1107	493.7	2.1402	0.1075	493.6	2.1366	65
70	0.1198	498.5	2.1610	0.1160	498.4	2.1572	0.1125	498.3	2.1536	0.1092	498.1	2.1500	70
75	0.1217	503.1	2.1742	0.1179	502.9	2.1705	0.1143	502.8	2.1668	0.1110	502.7	2.1633	75
80	0.1236	507.7	2.1873	0.1197	507.5	2.1836	0.1161	507.4	2.1800	0.1127	507.3	2.1764	80
85	0.1255	512.3	2.2003	0.1216	512.2	2.1966	0.1179	512.1	2.1930	0.1145	512.0	2.1895	85
90	0.1273	516.9	2.2132	0.1234	516.8	2.2095	0.1197	516.7	2.2059	0.1162	516.6	2.2024	90
95	0.1292	521.6	2.2260	0.1252	521.5	2.2223	0.1215	521.4	2.2187	0.1179	521.3	2.2152	95
100	0.1311	526.3	2.2387	0.1271	526.2	2.2351	0.1233	526.1	2.2315	0.1197	526.1	2.2280	100
105	0.1330	531.1	2.2514	0.1289	531.0	2.2477	0.1250	530.9	2.2441	0.1214	530.8	2.2406	105
110	0.1349	535.8	2.2639	0.1307	535.7	2.2602	0.1268	535.7	2.2566	0.1231	535.6	2.2531	110
115	0.1367	540.6	2.2763	0.1325	540.5	2.2726	0.1285	540.5	2.2691	0.1248	540.4	2.2656	115
120	0.1386	545.4	2.2886	0.1343	545.4	2.2850	0.1303	545.3	2.2814	0.1265	545.2	2.2780	120
125	0.1404	550.3	2.3009	0.1361	550.2	2.2972	0.1321	550.1	2.2937	0.1282	550.1	2.2902	125
130	0.1379	555.1	2.3094	0.1338	555.0	2.3059	0.1299	554.9	2.3024				130

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	60.0			370.0			380.0			390.0			Temp [°C]
	-22.75 °C			-22.03 °C			-21.33 °C			-20.64 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0714	414.6	1.8632	0.0696	414.9	1.8615	0.0678	415.2	1.8599	0.0661	415.5	1.8583	
-20	0.0726	417.2	1.8733	0.0704	416.8	1.8690	0.0683	416.4	1.8648	0.0664	416.1	1.8607	-20
-15	0.0748	421.8	1.8912	0.0725	421.4	1.8871	0.0704	421.1	1.8830	0.0684	420.8	1.8790	-15
-10	0.0768	426.3	1.9087	0.0745	426.0	1.9046	0.0724	425.7	1.9006	0.0703	425.4	1.8968	-10
-5	0.0788	430.8	1.9256	0.0765	430.5	1.9217	0.0743	430.2	1.9178	0.0722	430.0	1.9140	-5
0	0.0808	435.3	1.9422	0.0785	435.0	1.9383	0.0762	434.8	1.9345	0.0741	434.5	1.9308	0
5	0.0828	439.7	1.9583	0.0804	439.5	1.9545	0.0781	439.3	1.9508	0.0759	439.0	1.9472	5
10	0.0847	444.2	1.9742	0.0822	444.0	1.9704	0.0799	443.7	1.9668	0.0777	443.5	1.9632	10
15	0.0866	448.6	1.9897	0.0841	448.4	1.9860	0.0817	448.2	1.9824	0.0795	448.0	1.9789	15
20	0.0884	453.1	2.0050	0.0859	452.9	2.0014	0.0835	452.7	1.9978	0.0812	452.5	1.9943	20
25	0.0903	457.5	2.0200	0.0877	457.3	2.0164	0.0853	457.1	2.0129	0.0829	457.0	2.0094	25
30	0.0921	462.0	2.0348	0.0895	461.8	2.0313	0.0870	461.6	2.0278	0.0846	461.4	2.0243	30
35	0.0939	466.4	2.0494	0.0912	466.2	2.0459	0.0887	466.1	2.0424	0.0863	465.9	2.0390	35
40	0.0957	470.9	2.0638	0.0930	470.7	2.0603	0.0904	470.6	2.0568	0.0880	470.4	2.0535	40
45	0.0974	475.4	2.0780	0.0947	475.2	2.0745	0.0921	475.1	2.0711	0.0896	474.9	2.0678	45
50	0.0992	479.9	2.0920	0.0964	479.7	2.0885	0.0938	479.6	2.0851	0.0913	479.4	2.0818	50
55	0.1009	484.4	2.1058	0.0981	484.2	2.1024	0.0954	484.1	2.0990	0.0929	484.0	2.0958	55
60	0.1027	488.9	2.1195	0.0998	488.8	2.1161	0.0971	488.6	2.1128	0.0945	488.5	2.1095	60
65	0.1044	493.4	2.1331	0.1015	493.3	2.1297	0.0987	493.2	2.1264	0.0961	493.1	2.1231	65
70	0.1061	498.0	2.1465	0.1032	497.9	2.1431	0.1004	497.8	2.1398	0.0977	497.7	2.1366	70
75	0.1078	502.6	2.1598	0.1048	502.5	2.1564	0.1020	502.4	2.1532	0.0993	502.3	2.1500	75
80	0.1095	507.2	2.1730	0.1065	507.1	2.1696	0.1036	507.0	2.1664	0.1009	506.9	2.1632	80
85	0.1112	511.9	2.1860	0.1081	511.8	2.1827	0.1052	511.7	2.1794	0.1024	511.6	2.1763	85
90	0.1129	516.5	2.1990	0.1098	516.5	2.1957	0.1068	516.4	2.1924	0.1040	516.3	2.1892	90
95	0.1146	521.2	2.2118	0.1114	521.2	2.2085	0.1084	521.1	2.2053	0.1056	521.0	2.2021	95
100	0.1163	526.0	2.2246	0.1131	525.9	2.2213	0.1100	525.8	2.2180	0.1071	525.7	2.2149	100
105	0.1179	530.7	2.2372	0.1147	530.6	2.2339	0.1116	530.5	2.2307	0.1087	530.5	2.2276	105
110	0.1196	535.5	2.2498	0.1163	535.4	2.2465	0.1132	535.3	2.2433	0.1102	535.2	2.2401	110
115	0.1213	540.3	2.2622	0.1179	540.2	2.2589	0.1148	540.1	2.2557	0.1118	540.1	2.2526	115
120	0.1229	545.1	2.2746	0.1196	545.0	2.2713	0.1164	545.0	2.2681	0.1133	544.9	2.2650	120
125	0.1246	550.0	2.2869	0.1212	549.9	2.2836	0.1179	549.8	2.2804	0.1149	549.8	2.2773	125
130	0.1263	554.9	2.2991	0.1228	554.8	2.2958	0.1195	554.7	2.2926	0.1164	554.7	2.2895	130

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	400.0			425.0			450.0			475.0			Temp [°C]
	-19.97 °C			-18.34 °C			-16.78 °C			-15.29 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0645	415.7	1.8568	0.0608	416.4	1.8531	0.0575	417.0	1.8496	0.0545	417.5	1.8464	
-15	0.0665	420.4	1.8751	0.0621	419.6	1.8655	0.0582	418.7	1.8563	0.0546	417.8	1.8474	-15
-10	0.0684	425.1	1.8929	0.0639	424.3	1.8837	0.0599	423.5	1.8747	0.0564	422.7	1.8661	-10
-5	0.0703	429.7	1.9103	0.0657	428.9	1.9012	0.0617	428.2	1.8925	0.0580	427.5	1.8842	-5
0	0.0721	434.2	1.9271	0.0675	433.6	1.9183	0.0633	432.9	1.9098	0.0597	432.2	1.9017	0
5	0.0739	438.8	1.9436	0.0692	438.1	1.9349	0.0650	437.5	1.9266	0.0612	436.9	1.9187	5
10	0.0756	443.3	1.9597	0.0708	442.7	1.9512	0.0666	442.1	1.9430	0.0628	441.5	1.9352	10
15	0.0774	447.8	1.9754	0.0725	447.2	1.9670	0.0682	446.7	1.9591	0.0643	446.1	1.9514	15
20	0.0791	452.3	1.9909	0.0741	451.8	1.9826	0.0697	451.3	1.9748	0.0658	450.7	1.9672	20
25	0.0807	456.8	2.0061	0.0757	456.3	1.9979	0.0712	455.8	1.9902	0.0672	455.3	1.9828	25
30	0.0824	461.3	2.0210	0.0773	460.8	2.0130	0.0727	460.4	2.0053	0.0687	459.9	1.9980	30
35	0.0841	465.8	2.0357	0.0789	465.3	2.0278	0.0742	464.9	2.0202	0.0701	464.5	2.0130	35
40	0.0857	470.3	2.0502	0.0804	469.9	2.0423	0.0757	469.5	2.0348	0.0715	469.1	2.0277	40
45	0.0873	474.8	2.0645	0.0819	474.4	2.0567	0.0772	474.0	2.0493	0.0729	473.6	2.0422	45
50	0.0889	479.3	2.0786	0.0834	478.9	2.0709	0.0786	478.6	2.0635	0.0743	478.2	2.0565	50
55	0.0905	483.8	2.0926	0.0849	483.5	2.0849	0.0800	483.2	2.0776	0.0756	482.8	2.0706	55
60	0.0921	488.4	2.1064	0.0864	488.1	2.0987	0.0814	487.8	2.0915	0.0770	487.4	2.0846	60
65	0.0936	493.0	2.1200	0.0879	492.7	2.1124	0.0829	492.4	2.1052	0.0783	492.1	2.0983	65
70	0.0952	497.6	2.1335	0.0894	497.3	2.1259	0.0843	497.0	2.1188	0.0797	496.7	2.1119	70
75	0.0967	502.2	2.1468	0.0909	501.9	2.1393	0.0856	501.6	2.1322	0.0810	501.4	2.1254	75
80	0.0983	506.8	2.1601	0.0923	506.6	2.1526	0.0870	506.3	2.1455	0.0823	506.0	2.1387	80
85	0.0998	511.5	2.1732	0.0938	511.2	2.1657	0.0884	511.0	2.1587	0.0836	510.7	2.1519	85
90	0.1013	516.2	2.1862	0.0952	515.9	2.1787	0.0898	515.7	2.1717	0.0849	515.4	2.1650	90
95	0.1029	520.9	2.1990	0.0967	520.6	2.1916	0.0912	520.4	2.1846	0.0862	520.2	2.1780	95
100	0.1044	525.6	2.2118	0.0981	525.4	2.2044	0.0925	525.2	2.1975	0.0875	524.9	2.1908	100
105	0.1059	530.4	2.2245	0.0995	530.2	2.2171	0.0939	529.9	2.2102	0.0888	529.7	2.2036	105
110	0.1074	535.2	2.2371	0.1010	535.0	2.2297	0.0952	534.7	2.2228	0.0901	534.5	2.2162	110
115	0.1089	540.0	2.2496	0.1024	539.8	2.2422	0.0966	539.6	2.2353	0.0914	539.4	2.2288	115
120	0.1104	544.8	2.2620	0.1038	544.6	2.2547	0.0979	544.4	2.2478	0.0926	544.2	2.2412	120
125	0.1119	549.7	2.2743	0.1052	549.5	2.2670	0.0993	549.3	2.2601	0.0939	549.1	2.2536	125
130	0.1134	554.6	2.2865	0.1066	554.4	2.2792	0.1006	554.2	2.2724	0.0952	554.0	2.2658	130
135	0.1149	559.5	2.2986	0.1080	559.3	2.2914	0.1019	559.2	2.2845	0.0965	559.0	2.2780	135

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	500.0			525.0			550.0			575.0			Temp [°C]
	-13.85 °C			-12.47 °C			-11.14 °C			-9.85 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0519	418.0	1.8432	0.0494	418.5	1.8403	0.0472	419.0	1.8375	0.0452	419.4	1.8347	
-10	0.0532	421.8	1.8578	0.0502	421.0	1.8497	0.0476	420.2	1.8419				-10
-5	0.0548	426.7	1.8761	0.0518	425.9	1.8683	0.0491	425.2	1.8607	0.0466	424.4	1.8533	-5
0	0.0563	431.5	1.8938	0.0533	430.8	1.8862	0.0506	430.1	1.8789	0.0481	429.4	1.8717	0
5	0.0579	436.2	1.9110	0.0548	435.6	1.9036	0.0520	434.9	1.8965	0.0495	434.3	1.8895	5
10	0.0593	440.9	1.9277	0.0562	440.3	1.9205	0.0534	439.7	1.9135	0.0508	439.1	1.9068	10
15	0.0608	445.6	1.9441	0.0576	445.0	1.9370	0.0548	444.5	1.9302	0.0521	443.9	1.9236	15
20	0.0622	450.2	1.9600	0.0590	449.7	1.9531	0.0561	449.2	1.9464	0.0534	448.7	1.9399	20
25	0.0636	454.9	1.9757	0.0604	454.4	1.9688	0.0574	453.9	1.9623	0.0547	453.4	1.9559	25
30	0.0650	459.5	1.9910	0.0617	459.0	1.9843	0.0587	458.5	1.9778	0.0559	458.1	1.9715	30
35	0.0664	464.1	2.0060	0.0630	463.6	1.9994	0.0599	463.2	1.9930	0.0571	462.8	1.9869	35
40	0.0677	468.7	2.0209	0.0643	468.3	2.0143	0.0612	467.9	2.0080	0.0583	467.4	2.0019	40
45	0.0690	473.3	2.0354	0.0656	472.9	2.0290	0.0624	472.5	2.0227	0.0595	472.1	2.0167	45
50	0.0704	477.9	2.0498	0.0668	477.5	2.0434	0.0636	477.2	2.0372	0.0607	476.8	2.0313	50
55	0.0717	482.5	2.0640	0.0681	482.1	2.0576	0.0648	481.8	2.0515	0.0618	481.5	2.0456	55
60	0.0730	487.1	2.0780	0.0693	486.8	2.0717	0.0660	486.5	2.0656	0.0630	486.1	2.0598	60
65	0.0742	491.8	2.0918	0.0705	491.4	2.0855	0.0672	491.1	2.0795	0.0641	490.8	2.0738	65
70	0.0755	496.4	2.1054	0.0718	496.1	2.0992	0.0684	495.8	2.0933	0.0653	495.5	2.0876	70
75	0.0768	501.1	2.1190	0.0730	500.8	2.1128	0.0695	500.5	2.1069	0.0664	500.2	2.1012	75
80	0.0780	505.8	2.1323	0.0742	505.5	2.1262	0.0707	505.2	2.1203	0.0675	505.0	2.1147	80
85	0.0793	510.5	2.1456	0.0754	510.2	2.1394	0.0718	510.0	2.1336	0.0686	509.7	2.1280	85
90	0.0805	515.2	2.1587	0.0766	515.0	2.1526	0.0730	514.7	2.1468	0.0697	514.5	2.1412	90
95	0.0818	519.9	2.1717	0.0778	519.7	2.1656	0.0741	519.5	2.1598	0.0708	519.2	2.1543	95
100	0.0830	524.7	2.1845	0.0789	524.5	2.1785	0.0752	524.3	2.1727	0.0719	524.0	2.1672	100
105	0.0842	529.5	2.1973	0.0801	529.3	2.1913	0.0764	529.1	2.1855	0.0729	528.9	2.1800	105
110	0.0855	534.3	2.2100	0.0813	534.1	2.2040	0.0775	533.9	2.1983	0.0740	533.7	2.1928	110
115	0.0867	539.2	2.2225	0.0825	539.0	2.2166	0.0786	538.8	2.2109	0.0751	538.6	2.2054	115
120	0.0879	544.0	2.2350	0.0836	543.9	2.2290	0.0797	543.7	2.2234	0.0762	543.5	2.2179	120
125	0.0891	548.9	2.2474	0.0848	548.8	2.2414	0.0808	548.6	2.2358	0.0772	548.4	2.2303	125
130	0.0903	553.9	2.2596	0.0859	553.7	2.2537	0.0819	553.5	2.2481	0.0783	553.3	2.2427	130
135	0.0915	558.8	2.2718	0.0871	558.6	2.2660	0.0830	558.5	2.2603	0.0793	558.3	2.2549	135
140	0.0927	563.8	2.2840	0.0882	563.6	2.2781	0.0841	563.5	2.2725	0.0804	563.3	2.2671	140
145				0.0815	568.3	2.2791							145

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	600.0			625.0			650.0			675.0			Temp [°C]
	-8.61 °C			-7.40 °C			-6.24 °C			-5.10 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0433	419.9	1.8322	0.0416	420.3	1.8297	0.0400	420.6	1.8273	0.0385	421.0	1.8249	
-5	0.0444	423.6	1.8461	0.0423	422.8	1.8390	0.0404	422.0	1.8321	0.0386	421.1	1.8253	-5
0	0.0458	428.6	1.8648	0.0437	427.9	1.8580	0.0417	427.1	1.8513	0.0399	426.4	1.8448	0
5	0.0471	433.6	1.8828	0.0450	432.9	1.8762	0.0430	432.2	1.8698	0.0411	431.5	1.8635	5
10	0.0484	438.5	1.9002	0.0463	437.9	1.8938	0.0442	437.2	1.8876	0.0424	436.6	1.8815	10
15	0.0497	443.3	1.9172	0.0475	442.8	1.9109	0.0454	442.2	1.9049	0.0435	441.6	1.8990	15
20	0.0510	448.1	1.9337	0.0487	447.6	1.9276	0.0466	447.0	1.9217	0.0447	446.5	1.9159	20
25	0.0522	452.9	1.9498	0.0499	452.4	1.9438	0.0478	451.9	1.9380	0.0458	451.4	1.9324	25
30	0.0534	457.6	1.9655	0.0511	457.2	1.9597	0.0489	456.7	1.9540	0.0469	456.2	1.9485	30
35	0.0546	462.3	1.9809	0.0522	461.9	1.9752	0.0500	461.5	1.9696	0.0480	461.0	1.9642	35
40	0.0557	467.0	1.9961	0.0533	466.6	1.9904	0.0511	466.2	1.9849	0.0491	465.8	1.9796	40
45	0.0569	471.7	2.0110	0.0544	471.3	2.0054	0.0522	471.0	2.0000	0.0501	470.6	1.9947	45
50	0.0580	476.4	2.0256	0.0555	476.1	2.0201	0.0532	475.7	2.0147	0.0511	475.3	2.0095	50
55	0.0591	481.1	2.0400	0.0566	480.8	2.0345	0.0543	480.4	2.0293	0.0521	480.1	2.0241	55
60	0.0602	485.8	2.0542	0.0577	485.5	2.0488	0.0553	485.2	2.0436	0.0531	484.8	2.0385	60
65	0.0613	490.5	2.0682	0.0587	490.2	2.0629	0.0563	489.9	2.0577	0.0541	489.6	2.0527	65
70	0.0624	495.2	2.0820	0.0598	494.9	2.0767	0.0574	494.6	2.0716	0.0551	494.3	2.0666	70
75	0.0635	500.0	2.0957	0.0608	499.7	2.0904	0.0584	499.4	2.0854	0.0561	499.1	2.0804	75
80	0.0645	504.7	2.1092	0.0618	504.4	2.1040	0.0594	504.2	2.0989	0.0570	503.9	2.0941	80
85	0.0656	509.4	2.1226	0.0629	509.2	2.1174	0.0603	508.9	2.1124	0.0580	508.7	2.1075	85
90	0.0667	514.2	2.1358	0.0639	514.0	2.1307	0.0613	513.7	2.1257	0.0590	513.5	2.1208	90
95	0.0677	519.0	2.1489	0.0649	518.8	2.1438	0.0623	518.5	2.1388	0.0599	518.3	2.1340	95
100	0.0688	523.8	2.1619	0.0659	523.6	2.1568	0.0633	523.4	2.1518	0.0608	523.1	2.1471	100
105	0.0698	528.6	2.1748	0.0669	528.4	2.1697	0.0642	528.2	2.1647	0.0618	528.0	2.1600	105
110	0.0708	533.5	2.1875	0.0679	533.3	2.1824	0.0652	533.1	2.1775	0.0627	532.9	2.1728	110
115	0.0719	538.4	2.2001	0.0689	538.2	2.1951	0.0662	538.0	2.1902	0.0636	537.8	2.1855	115
120	0.0729	543.3	2.2127	0.0699	543.1	2.2076	0.0671	542.9	2.2028	0.0646	542.7	2.1981	120
125	0.0739	548.2	2.2251	0.0709	548.0	2.2201	0.0681	547.8	2.2153	0.0655	547.6	2.2106	125
130	0.0749	553.1	2.2375	0.0719	553.0	2.2325	0.0690	552.8	2.2277	0.0664	552.6	2.2230	130
135	0.0760	558.1	2.2497	0.0728	557.9	2.2447	0.0700	557.8	2.2399	0.0673	557.6	2.2353	135
140	0.0770	563.1	2.2619	0.0738	562.9	2.2569	0.0709	562.8	2.2521	0.0682	562.6	2.2475	140
145	0.0780	568.1	2.2740	0.0748	568.0	2.2690	0.0718	567.8	2.2642	0.0691	567.6	2.2596	145

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	700.0			725.0			750.0			800.0			Temp [°C]
	-4.00 °C			-2.92 °C			-1.88 °C			0.14 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0372	421.4	1.8227	0.0359	421.7	1.8206	0.0347	422.0	1.8185	0.0325	422.6	1.8145	
0	0.0382	425.6	1.8384	0.0366	424.8	1.8322	0.0351	424.1	1.8260				0
5	0.0394	430.8	1.8574	0.0378	430.1	1.8514	0.0363	429.4	1.8454	0.0336	427.9	1.8339	5
10	0.0406	436.0	1.8756	0.0390	435.3	1.8698	0.0375	434.6	1.8641	0.0347	433.3	1.8530	10
15	0.0418	441.0	1.8932	0.0401	440.4	1.8876	0.0386	439.8	1.8821	0.0358	438.6	1.8714	15
20	0.0429	446.0	1.9103	0.0412	445.4	1.9048	0.0397	444.8	1.8995	0.0368	443.7	1.8891	20
25	0.0440	450.9	1.9269	0.0423	450.3	1.9216	0.0407	449.8	1.9164	0.0378	448.8	1.9062	25
30	0.0451	455.7	1.9431	0.0433	455.3	1.9379	0.0417	454.8	1.9328	0.0388	453.8	1.9229	30
35	0.0461	460.6	1.9589	0.0444	460.1	1.9538	0.0427	459.7	1.9488	0.0398	458.8	1.9392	35
40	0.0471	465.4	1.9744	0.0454	465.0	1.9694	0.0437	464.5	1.9645	0.0407	463.7	1.9550	40
45	0.0482	470.2	1.9896	0.0464	469.8	1.9847	0.0447	469.4	1.9798	0.0416	468.6	1.9705	45
50	0.0492	475.0	2.0045	0.0473	474.6	1.9996	0.0456	474.2	1.9949	0.0425	473.5	1.9857	50
55	0.0501	479.7	2.0192	0.0483	479.4	2.0144	0.0465	479.0	2.0097	0.0434	478.3	2.0007	55
60	0.0511	484.5	2.0336	0.0492	484.2	2.0288	0.0475	483.8	2.0242	0.0443	483.2	2.0153	60
65	0.0521	489.3	2.0478	0.0502	489.0	2.0431	0.0484	488.6	2.0385	0.0451	488.0	2.0297	65
70	0.0530	494.0	2.0618	0.0511	493.7	2.0572	0.0493	493.4	2.0526	0.0460	492.8	2.0439	70
75	0.0540	498.8	2.0757	0.0520	498.5	2.0710	0.0502	498.3	2.0666	0.0468	497.7	2.0579	75
80	0.0549	503.6	2.0893	0.0529	503.3	2.0847	0.0510	503.1	2.0803	0.0477	502.5	2.0718	80
85	0.0558	508.4	2.1028	0.0538	508.2	2.0983	0.0519	507.9	2.0939	0.0485	507.4	2.0854	85
90	0.0568	513.2	2.1162	0.0547	513.0	2.1117	0.0528	512.7	2.1073	0.0493	512.2	2.0989	90
95	0.0577	518.1	2.1294	0.0556	517.8	2.1249	0.0536	517.6	2.1205	0.0501	517.1	2.1122	95
100	0.0586	522.9	2.1425	0.0565	522.7	2.1380	0.0545	522.5	2.1337	0.0509	522.0	2.1254	100
105	0.0595	527.8	2.1554	0.0573	527.6	2.1510	0.0554	527.3	2.1467	0.0517	526.9	2.1384	105
110	0.0604	532.7	2.1683	0.0582	532.5	2.1638	0.0562	532.2	2.1596	0.0525	531.8	2.1514	110
115	0.0613	537.6	2.1810	0.0591	537.4	2.1766	0.0570	537.2	2.1723	0.0533	536.8	2.1642	115
120	0.0622	542.5	2.1936	0.0600	542.3	2.1892	0.0579	542.1	2.1850	0.0541	541.7	2.1768	120
125	0.0631	547.4	2.2061	0.0608	547.3	2.2017	0.0587	547.1	2.1975	0.0549	546.7	2.1894	125
130	0.0639	552.4	2.2185	0.0617	552.2	2.2142	0.0595	552.0	2.2100	0.0557	551.7	2.2019	130
135	0.0648	557.4	2.2308	0.0625	557.2	2.2265	0.0604	557.1	2.2223	0.0565	556.7	2.2143	135
140	0.0657	562.4	2.2431	0.0634	562.3	2.2387	0.0612	562.1	2.2345	0.0573	561.7	2.2266	140
145	0.0666	567.5	2.2552	0.0642	567.3	2.2509	0.0620	567.1	2.2467	0.0580	566.8	2.2387	145
150	0.0675	572.5	2.2672	0.0651	572.4	2.2629	0.0628	572.2	2.2588	0.0588	571.9	2.2508	150
155										0.0596	577.0	2.2629	155

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	850.0			900.0			950.0			1000.0			Temp [°C]
	2.06 °C			3.90 °C			5.66 °C			7.36 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0305	423.1	1.8107	0.0288	423.6	1.8071	0.0273	424.1	1.8036	0.0259	424.5	1.8004	
5	0.0312	426.4	1.8226	0.0291	424.9	1.8116							5
10	0.0323	431.9	1.8422	0.0301	430.5	1.8318	0.0282	429.1	1.8215	0.0264	427.6	1.8115	10
15	0.0333	437.3	1.8610	0.0311	436.0	1.8510	0.0291	434.7	1.8412	0.0274	433.4	1.8316	15
20	0.0343	442.6	1.8791	0.0321	441.4	1.8694	0.0301	440.2	1.8600	0.0283	438.9	1.8508	20
25	0.0353	447.7	1.8965	0.0330	446.6	1.8872	0.0310	445.5	1.8781	0.0292	444.4	1.8693	25
30	0.0362	452.8	1.9135	0.0339	451.8	1.9044	0.0319	450.8	1.8956	0.0300	449.7	1.8870	30
35	0.0372	457.8	1.9299	0.0348	456.9	1.9211	0.0327	455.9	1.9125	0.0309	455.0	1.9042	35
40	0.0380	462.8	1.9460	0.0357	461.9	1.9373	0.0336	461.1	1.9290	0.0317	460.2	1.9209	40
45	0.0389	467.8	1.9617	0.0365	467.0	1.9532	0.0344	466.1	1.9450	0.0324	465.3	1.9371	45
50	0.0398	472.7	1.9770	0.0374	471.9	1.9687	0.0352	471.1	1.9607	0.0332	470.4	1.9529	50
55	0.0406	477.6	1.9921	0.0382	476.9	1.9839	0.0360	476.1	1.9760	0.0340	475.4	1.9684	55
60	0.0415	482.5	2.0068	0.0390	481.8	1.9988	0.0367	481.1	1.9910	0.0347	480.4	1.9836	60
65	0.0423	487.4	2.0214	0.0397	486.7	2.0134	0.0375	486.1	2.0058	0.0354	485.4	1.9984	65
70	0.0431	492.2	2.0357	0.0405	491.6	2.0278	0.0382	491.0	2.0203	0.0361	490.4	2.0130	70
75	0.0439	497.1	2.0498	0.0413	496.5	2.0420	0.0389	495.9	2.0345	0.0368	495.3	2.0274	75
80	0.0447	502.0	2.0637	0.0420	501.4	2.0560	0.0397	500.9	2.0486	0.0375	500.3	2.0415	80
85	0.0455	506.8	2.0774	0.0428	506.3	2.0697	0.0404	505.8	2.0625	0.0382	505.3	2.0555	85
90	0.0463	511.7	2.0909	0.0435	511.2	2.0834	0.0411	510.7	2.0761	0.0389	510.2	2.0692	90
95	0.0470	516.6	2.1043	0.0443	516.1	2.0968	0.0418	515.7	2.0896	0.0396	515.2	2.0828	95
100	0.0478	521.5	2.1175	0.0450	521.1	2.1101	0.0425	520.6	2.1030	0.0402	520.1	2.0962	100
105	0.0486	526.5	2.1306	0.0457	526.0	2.1232	0.0432	525.6	2.1162	0.0409	525.1	2.1094	105
110	0.0493	531.4	2.1436	0.0464	531.0	2.1362	0.0439	530.5	2.1292	0.0416	530.1	2.1225	110
115	0.0501	536.3	2.1565	0.0472	535.9	2.1491	0.0446	535.5	2.1422	0.0422	535.1	2.1355	115
120	0.0508	541.3	2.1692	0.0479	540.9	2.1619	0.0452	540.5	2.1550	0.0429	540.1	2.1484	120
125	0.0516	546.3	2.1818	0.0486	545.9	2.1745	0.0459	545.5	2.1677	0.0435	545.2	2.1611	125
130	0.0523	551.3	2.1943	0.0493	550.9	2.1871	0.0466	550.6	2.1802	0.0441	550.2	2.1737	130
135	0.0530	556.3	2.2067	0.0500	556.0	2.1995	0.0472	555.6	2.1927	0.0448	555.3	2.1862	135
140	0.0538	561.4	2.2190	0.0507	561.1	2.2119	0.0479	560.7	2.2051	0.0454	560.4	2.1986	140
145	0.0545	566.5	2.2312	0.0514	566.1	2.2241	0.0486	565.8	2.2173	0.0461	565.5	2.2109	145
150	0.0552	571.6	2.2433	0.0521	571.3	2.2362	0.0492	570.9	2.2295	0.0467	570.6	2.2231	150
155	0.0560	576.7	2.2554	0.0528	576.4	2.2483	0.0499	576.1	2.2416	0.0473	575.8	2.2352	155
160	0.0505	581.2	2.2536	0.0479	580.9	2.2472							160

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	1100.0			1200.0			1300.0			1400.0			Temp [°C]
	10.56 °C			13.55 °C			16.36 °C			19.01 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0234	425.2	1.7942	0.0214	425.8	1.7885	0.0196	426.3	1.7831	0.0181	426.7	1.7780	
15	0.0243	430.6	1.8130	0.0216	427.6	1.7948							15
20	0.0251	436.4	1.8331	0.0225	433.8	1.8159	0.0203	431.0	1.7991	0.0183	428.0	1.7825	20
25	0.0260	442.1	1.8523	0.0233	439.7	1.8359	0.0211	437.2	1.8201	0.0191	434.5	1.8045	25
30	0.0268	447.6	1.8707	0.0241	445.4	1.8550	0.0218	443.1	1.8399	0.0198	440.7	1.8251	30
35	0.0276	453.0	1.8884	0.0249	451.0	1.8733	0.0226	448.9	1.8588	0.0206	446.7	1.8447	35
40	0.0284	458.3	1.9055	0.0256	456.5	1.8909	0.0233	454.5	1.8769	0.0212	452.5	1.8635	40
45	0.0291	463.6	1.9221	0.0263	461.8	1.9079	0.0239	460.0	1.8944	0.0219	458.2	1.8814	45
50	0.0298	468.8	1.9383	0.0270	467.1	1.9245	0.0246	465.5	1.9113	0.0225	463.8	1.8988	50
55	0.0305	473.9	1.9541	0.0276	472.4	1.9406	0.0252	470.8	1.9278	0.0231	469.2	1.9156	55
60	0.0312	479.0	1.9695	0.0283	477.6	1.9563	0.0258	476.1	1.9438	0.0237	474.6	1.9319	60
65	0.0319	484.1	1.9846	0.0289	482.7	1.9716	0.0264	481.3	1.9594	0.0243	480.0	1.9477	65
70	0.0325	489.1	1.9994	0.0296	487.8	1.9866	0.0270	486.5	1.9746	0.0248	485.2	1.9632	70
75	0.0332	494.1	2.0139	0.0302	492.9	2.0014	0.0276	491.7	1.9896	0.0254	490.5	1.9784	75
80	0.0338	499.2	2.0282	0.0308	498.0	2.0159	0.0282	496.9	2.0042	0.0259	495.7	1.9933	80
85	0.0345	504.2	2.0423	0.0314	503.1	2.0301	0.0287	502.0	2.0186	0.0265	500.9	2.0078	85
90	0.0351	509.2	2.0562	0.0320	508.1	2.0441	0.0293	507.1	2.0328	0.0270	506.0	2.0222	90
95	0.0357	514.2	2.0699	0.0325	513.2	2.0580	0.0298	512.2	2.0468	0.0275	511.2	2.0362	95
100	0.0363	519.2	2.0834	0.0331	518.2	2.0716	0.0304	517.3	2.0605	0.0280	516.3	2.0501	100
105	0.0370	524.2	2.0968	0.0337	523.3	2.0850	0.0309	522.4	2.0741	0.0285	521.5	2.0638	105
110	0.0376	529.2	2.1100	0.0342	528.4	2.0983	0.0314	527.5	2.0875	0.0290	526.6	2.0773	110
115	0.0382	534.3	2.1230	0.0348	533.4	2.1115	0.0319	532.6	2.1007	0.0295	531.7	2.0906	115
120	0.0388	539.3	2.1360	0.0354	538.5	2.1245	0.0325	537.7	2.1138	0.0300	536.9	2.1038	120
125	0.0394	544.4	2.1488	0.0359	543.6	2.1374	0.0330	542.8	2.1268	0.0305	542.0	2.1168	125
130	0.0399	549.5	2.1614	0.0364	548.7	2.1501	0.0335	548.0	2.1396	0.0309	547.2	2.1297	130
135	0.0405	554.6	2.1740	0.0370	553.8	2.1627	0.0340	553.1	2.1523	0.0314	552.4	2.1425	135
140	0.0411	559.7	2.1864	0.0375	559.0	2.1752	0.0345	558.3	2.1648	0.0319	557.6	2.1551	140
145	0.0417	564.8	2.1988	0.0381	564.1	2.1876	0.0350	563.4	2.1773	0.0324	562.8	2.1676	145
150	0.0423	569.9	2.2110	0.0386	569.3	2.1999	0.0355	568.6	2.1896	0.0328	568.0	2.1800	150
155	0.0429	575.1	2.2232	0.0391	574.5	2.2121	0.0360	573.8	2.2019	0.0333	573.2	2.1923	155
160	0.0434	580.3	2.2352	0.0397	579.7	2.2242	0.0365	579.1	2.2140	0.0338	578.5	2.2045	160
165	0.0440	585.5	2.2472	0.0402	584.9	2.2362	0.0370	584.3	2.2261	0.0342	583.7	2.2166	165
170	0.0375	589.6	2.2380	0.0347	589.0	2.2286							170

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	1500.0			1600.0			1700.0			1800.0			Temp [°C]
	21.52 °C			23.91 °C			26.19 °C			28.36 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0168	427.0	1.7731	0.0157	427.2	1.7684	0.0146	427.4	1.7639	0.0137	427.5	1.7595	
25	0.0174	431.7	1.7891	0.0158	428.8	1.7736							25
30	0.0181	438.2	1.8107	0.0166	435.6	1.7963	0.0152	432.9	1.7820	0.0140	430.0	1.7676	30
35	0.0188	444.5	1.8310	0.0173	442.1	1.8176	0.0159	439.7	1.8042	0.0147	437.1	1.7910	35
40	0.0195	450.5	1.8504	0.0179	448.3	1.8376	0.0165	446.1	1.8251	0.0153	443.8	1.8126	40
45	0.0201	456.3	1.8689	0.0185	454.4	1.8567	0.0172	452.3	1.8447	0.0159	450.3	1.8330	45
50	0.0207	462.0	1.8867	0.0191	460.2	1.8749	0.0177	458.4	1.8635	0.0165	456.5	1.8523	50
55	0.0213	467.6	1.9038	0.0197	465.9	1.8925	0.0183	464.2	1.8815	0.0170	462.5	1.8708	55
60	0.0219	473.1	1.9205	0.0202	471.5	1.9095	0.0188	470.0	1.8989	0.0175	468.3	1.8886	60
65	0.0224	478.5	1.9366	0.0208	477.1	1.9260	0.0193	475.6	1.9157	0.0180	474.1	1.9057	65
70	0.0229	483.9	1.9524	0.0213	482.5	1.9420	0.0198	481.1	1.9320	0.0185	479.7	1.9223	70
75	0.0235	489.2	1.9678	0.0218	487.9	1.9576	0.0203	486.6	1.9478	0.0190	485.3	1.9384	75
80	0.0240	494.5	1.9828	0.0223	493.3	1.9728	0.0208	492.0	1.9633	0.0195	490.8	1.9541	80
85	0.0245	499.7	1.9976	0.0228	498.6	1.9878	0.0213	497.4	1.9784	0.0199	496.3	1.9694	85
90	0.0250	505.0	2.0120	0.0232	503.9	2.0024	0.0217	502.8	1.9932	0.0203	501.7	1.9844	90
95	0.0255	510.2	2.0263	0.0237	509.1	2.0168	0.0222	508.1	2.0077	0.0208	507.0	1.9990	95
100	0.0260	515.3	2.0403	0.0242	514.4	2.0309	0.0226	513.4	2.0220	0.0212	512.4	2.0134	100
105	0.0264	520.5	2.0541	0.0246	519.6	2.0448	0.0230	518.6	2.0360	0.0216	517.7	2.0276	105
110	0.0269	525.7	2.0677	0.0251	524.8	2.0586	0.0235	523.9	2.0499	0.0220	523.0	2.0415	110
115	0.0274	530.9	2.0811	0.0255	530.0	2.0721	0.0239	529.2	2.0635	0.0224	528.3	2.0553	115
120	0.0278	536.1	2.0944	0.0260	535.2	2.0854	0.0243	534.4	2.0769	0.0228	533.6	2.0688	120
125	0.0283	541.2	2.1075	0.0264	540.5	2.0986	0.0247	539.6	2.0902	0.0232	538.8	2.0821	125
130	0.0287	546.4	2.1204	0.0268	545.7	2.1116	0.0251	544.9	2.1033	0.0236	544.1	2.0953	130
135	0.0292	551.6	2.1332	0.0272	550.9	2.1245	0.0255	550.2	2.1162	0.0240	549.4	2.1083	135
140	0.0296	556.8	2.1459	0.0277	556.1	2.1373	0.0259	555.4	2.1290	0.0244	554.7	2.1212	140
145	0.0301	562.1	2.1585	0.0281	561.4	2.1499	0.0263	560.7	2.1417	0.0248	560.0	2.1340	145
150	0.0305	567.3	2.1709	0.0285	566.6	2.1624	0.0267	566.0	2.1543	0.0251	565.3	2.1466	150
155	0.0310	572.6	2.1833	0.0289	571.9	2.1748	0.0271	571.3	2.1667	0.0255	570.6	2.1591	155
160	0.0314	577.8	2.1955	0.0293	577.2	2.1871	0.0275	576.6	2.1791	0.0259	575.9	2.1714	160
165	0.0318	583.1	2.2077	0.0297	582.5	2.1992	0.0279	581.9	2.1913	0.0263	581.3	2.1837	165
170	0.0323	588.4	2.2197	0.0302	587.8	2.2113	0.0283	587.2	2.2034	0.0266	586.6	2.1959	170
175	0.0327	593.7	2.2316	0.0306	593.2	2.2233	0.0287	592.6	2.2154	0.0270	592.0	2.2079	175
180							0.0291	598.0	2.2274	0.0274	597.4	2.2199	180

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													Temp [°C]
Temp [°C]	1900.0			2000.0			2200.0			2400.0			
	30.45 °C			32.46 °C			36.26 °C			39.81 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0129	427.6	1.7553	0.0122	427.6	1.7511	0.0109	427.4	1.7430	0.0098	427.0	1.7352	
35	0.0136	434.4	1.7776	0.0125	431.5	1.7641							35
40	0.0142	441.4	1.8003	0.0132	438.9	1.7879	0.0114	433.5	1.7627	0.0098	427.3	1.7363	40
45	0.0148	448.1	1.8214	0.0138	445.9	1.8099	0.0120	441.1	1.7868	0.0105	435.8	1.7632	45
50	0.0154	454.5	1.8414	0.0143	452.5	1.8305	0.0126	448.2	1.8090	0.0110	443.6	1.7874	50
55	0.0159	460.7	1.8603	0.0149	458.8	1.8500	0.0131	455.0	1.8297	0.0116	450.8	1.8096	55
60	0.0164	466.7	1.8785	0.0154	465.0	1.8686	0.0136	461.4	1.8493	0.0120	457.7	1.8305	60
65	0.0169	472.5	1.8960	0.0158	471.0	1.8865	0.0140	467.7	1.8680	0.0125	464.3	1.8501	65
70	0.0174	478.3	1.9128	0.0163	476.8	1.9037	0.0145	473.8	1.8859	0.0129	470.7	1.8688	70
75	0.0178	484.0	1.9292	0.0167	482.6	1.9203	0.0149	479.8	1.9032	0.0134	476.9	1.8867	75
80	0.0183	489.5	1.9451	0.0172	488.3	1.9365	0.0153	485.6	1.9199	0.0137	482.9	1.9040	80
85	0.0187	495.1	1.9607	0.0176	493.9	1.9522	0.0157	491.4	1.9360	0.0141	488.8	1.9206	85
90	0.0191	500.5	1.9758	0.0180	499.4	1.9676	0.0161	497.1	1.9518	0.0145	494.7	1.9368	90
95	0.0195	506.0	1.9907	0.0184	504.9	1.9826	0.0165	502.7	1.9671	0.0149	500.4	1.9525	95
100	0.0199	511.3	2.0052	0.0188	510.3	1.9973	0.0169	508.2	1.9821	0.0152	506.1	1.9679	100
105	0.0203	516.7	2.0195	0.0192	515.7	2.0117	0.0172	513.8	1.9968	0.0156	511.7	1.9828	105
110	0.0207	522.1	2.0335	0.0196	521.1	2.0259	0.0176	519.2	2.0112	0.0159	517.3	1.9975	110
115	0.0211	527.4	2.0474	0.0199	526.5	2.0398	0.0179	524.7	2.0254	0.0162	522.9	2.0119	115
120	0.0215	532.7	2.0610	0.0203	531.9	2.0535	0.0183	530.1	2.0393	0.0166	528.4	2.0260	120
125	0.0219	538.0	2.0744	0.0207	537.2	2.0670	0.0186	535.6	2.0530	0.0169	533.9	2.0399	125
130	0.0223	543.3	2.0877	0.0210	542.6	2.0804	0.0189	541.0	2.0665	0.0172	539.4	2.0536	130
135	0.0226	548.7	2.1008	0.0214	547.9	2.0935	0.0193	546.4	2.0799	0.0175	544.8	2.0671	135
140	0.0230	554.0	2.1137	0.0218	553.2	2.1066	0.0196	551.8	2.0930	0.0178	550.3	2.0804	140
145	0.0234	559.3	2.1265	0.0221	558.6	2.1194	0.0199	557.2	2.1060	0.0181	555.7	2.0935	145
150	0.0237	564.6	2.1392	0.0225	563.9	2.1321	0.0202	562.6	2.1188	0.0184	561.2	2.1065	150
155	0.0241	570.0	2.1517	0.0228	569.3	2.1447	0.0206	568.0	2.1315	0.0187	566.6	2.1193	155
160	0.0244	575.3	2.1642	0.0231	574.7	2.1572	0.0209	573.4	2.1441	0.0190	572.1	2.1319	160
165	0.0248	580.7	2.1765	0.0235	580.1	2.1696	0.0212	578.8	2.1566	0.0193	577.6	2.1445	165
170	0.0251	586.0	2.1887	0.0238	585.5	2.1818	0.0215	584.2	2.1689	0.0196	583.0	2.1569	170
175	0.0255	591.4	2.2008	0.0242	590.9	2.1939	0.0218	589.7	2.1811	0.0199	588.5	2.1692	175
180	0.0258	596.9	2.2128	0.0245	596.3	2.2060	0.0221	595.2	2.1932	0.0202	594.0	2.1814	180
185	0.0262	602.3	2.2247	0.0248	601.7	2.2179	0.0224	600.6	2.2052	0.0205	599.5	2.1935	185
190							0.0227	606.1	2.2171	0.0207	605.0	2.2054	190

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

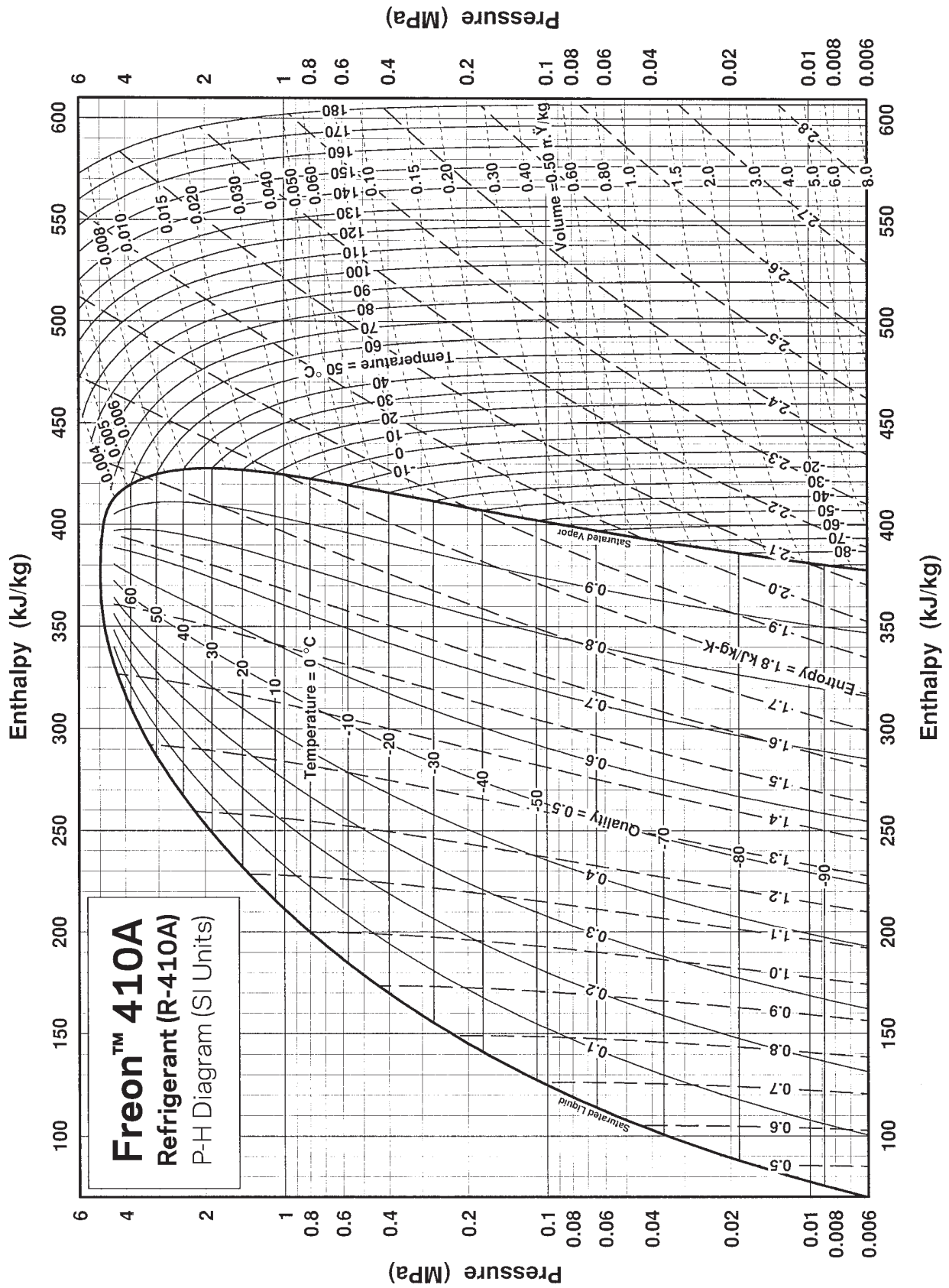
V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	2600.0			2800.0			3000.0			3200.0			Temp [°C]
	43.14 °C			46.28 °C			49.26 °C			52.09 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0089	426.4	1.7275	0.0081	425.7	1.7199	0.0074	424.8	1.7123	0.0068	423.8	1.7047	
45	0.0091	429.9	1.7384										45
50	0.0097	438.5	1.7653	0.0086	432.9	1.7422	0.0075	426.4	1.7172				50
55	0.0103	446.4	1.7894	0.0091	441.5	1.7688	0.0081	436.2	1.7472	0.0071	430.1	1.7242	55
60	0.0107	453.7	1.8117	0.0096	449.5	1.7928	0.0086	444.9	1.7735	0.0077	439.8	1.7534	60
65	0.0112	460.7	1.8325	0.0101	456.9	1.8149	0.0091	452.8	1.7972	0.0082	448.4	1.7791	65
70	0.0116	467.4	1.8521	0.0105	463.9	1.8355	0.0095	460.3	1.8191	0.0086	456.4	1.8025	70
75	0.0120	473.8	1.8707	0.0109	470.7	1.8551	0.0099	467.4	1.8396	0.0090	463.9	1.8241	75
80	0.0124	480.1	1.8886	0.0113	477.2	1.8736	0.0103	474.1	1.8589	0.0094	471.0	1.8444	80
85	0.0128	486.2	1.9058	0.0116	483.5	1.8914	0.0106	480.7	1.8774	0.0097	477.8	1.8636	85
90	0.0131	492.2	1.9224	0.0120	489.7	1.9085	0.0110	487.1	1.8951	0.0101	484.4	1.8818	90
95	0.0135	498.1	1.9386	0.0123	495.7	1.9251	0.0113	493.3	1.9121	0.0104	490.8	1.8994	95
100	0.0138	503.9	1.9542	0.0126	501.7	1.9412	0.0116	499.4	1.9286	0.0107	497.1	1.9163	100
105	0.0142	509.7	1.9695	0.0130	507.6	1.9568	0.0119	505.4	1.9445	0.0110	503.2	1.9327	105
110	0.0145	515.4	1.9845	0.0133	513.4	1.9720	0.0122	511.3	1.9601	0.0113	509.3	1.9485	110
115	0.0148	521.0	1.9991	0.0136	519.1	1.9869	0.0125	517.2	1.9752	0.0116	515.2	1.9640	115
120	0.0151	526.6	2.0135	0.0139	524.8	2.0015	0.0128	523.0	1.9901	0.0118	521.1	1.9791	120
125	0.0154	532.2	2.0276	0.0142	530.5	2.0158	0.0131	528.7	2.0046	0.0121	526.9	1.9938	125
130	0.0157	537.7	2.0414	0.0144	536.1	2.0299	0.0133	534.4	2.0188	0.0124	532.7	2.0083	130
135	0.0160	543.3	2.0551	0.0147	541.7	2.0437	0.0136	540.1	2.0328	0.0126	538.5	2.0224	135
140	0.0163	548.8	2.0685	0.0150	547.3	2.0573	0.0139	545.7	2.0466	0.0129	544.2	2.0364	140
145	0.0166	554.3	2.0818	0.0153	552.8	2.0707	0.0141	551.4	2.0601	0.0131	549.9	2.0500	145
150	0.0169	559.8	2.0948	0.0155	558.4	2.0839	0.0144	557.0	2.0735	0.0134	555.6	2.0635	150
155	0.0171	565.3	2.1078	0.0158	564.0	2.0969	0.0146	562.6	2.0866	0.0136	561.2	2.0768	155
160	0.0174	570.8	2.1205	0.0161	569.5	2.1098	0.0149	568.2	2.0996	0.0139	566.9	2.0899	160
165	0.0177	576.3	2.1332	0.0163	575.1	2.1225	0.0151	573.8	2.1125	0.0141	572.5	2.1029	165
170	0.0180	581.8	2.1457	0.0166	580.6	2.1351	0.0154	579.4	2.1252	0.0143	578.1	2.1157	170
175	0.0182	587.3	2.1581	0.0168	586.2	2.1476	0.0156	585.0	2.1377	0.0145	583.8	2.1283	175
180	0.0185	592.9	2.1703	0.0171	591.7	2.1599	0.0159	590.6	2.1501	0.0148	589.4	2.1408	180
185	0.0188	598.4	2.1825	0.0173	597.3	2.1722	0.0161	596.2	2.1624	0.0150	595.0	2.1532	185
190	0.0190	604.0	2.1945	0.0176	602.9	2.1843	0.0163	601.8	2.1746	0.0152	600.7	2.1655	190
195	0.0193	609.5	2.2065	0.0178	608.5	2.1963	0.0166	607.4	2.1867	0.0155	606.3	2.1776	195
200				0.0181	614.1	2.2082	0.0168	613.0	2.1987	0.0157	612.0	2.1896	200
205										0.0159	617.7	2.2016	205

Table 2. Freon™ 410A Superheated Vapor—Constant Pressure Table (continued)

V = Volume in m³/kg H = Enthalpy in kJ/kg S = Entropy in kJ/(kg)(K) Saturation Properties in Light Blue

Absolute Pressure [kPa]													
Temp [°C]	3400.0			3600.0			3800.0			4000.0			Temp [°C]
	54.78 °C			57.36 °C			59.84 °C			62.21 °C			
	V	H	S	V	H	S	V	H	S	V	H	S	
	0.0062	422.6	1.6971	0.0057	421.2	1.6893	0.0052	419.7	1.6813	0.0048	417.9	1.6730	
55	0.0062	423.1	1.6987										55
60	0.0068	434.1	1.7321	0.0060	427.7	1.7089	0.0053	420.1	1.6827				60
65	0.0074	443.7	1.7604	0.0066	438.4	1.7408	0.0059	432.5	1.7195	0.0052	425.6	1.6959	65
70	0.0078	452.2	1.7856	0.0071	447.8	1.7682	0.0064	442.8	1.7500	0.0058	437.4	1.7305	70
75	0.0082	460.2	1.8086	0.0075	456.2	1.7928	0.0068	452.0	1.7766	0.0062	447.4	1.7596	75
80	0.0086	467.6	1.8299	0.0079	464.1	1.8153	0.0072	460.4	1.8005	0.0066	456.5	1.7853	80
85	0.0089	474.8	1.8499	0.0082	471.6	1.8362	0.0076	468.3	1.8225	0.0070	464.7	1.8086	85
90	0.0093	481.6	1.8688	0.0086	478.7	1.8559	0.0079	475.7	1.8431	0.0073	472.5	1.8302	90
95	0.0096	488.2	1.8869	0.0089	485.5	1.8747	0.0082	482.8	1.8625	0.0076	479.9	1.8504	95
100	0.0099	494.7	1.9043	0.0092	492.2	1.8926	0.0085	489.6	1.8810	0.0079	487.0	1.8695	100
105	0.0102	501.0	1.9211	0.0095	498.6	1.9098	0.0088	496.3	1.8987	0.0082	493.8	1.8877	105
110	0.0105	507.1	1.9373	0.0097	505.0	1.9264	0.0091	502.7	1.9157	0.0085	500.5	1.9051	110
115	0.0107	513.2	1.9531	0.0100	511.2	1.9425	0.0093	509.1	1.9321	0.0087	506.9	1.9220	115
120	0.0110	519.2	1.9684	0.0103	517.3	1.9581	0.0096	515.3	1.9481	0.0090	513.3	1.9382	120
125	0.0113	525.1	1.9834	0.0105	523.3	1.9734	0.0098	521.4	1.9636	0.0092	519.5	1.9540	125
130	0.0115	531.0	1.9981	0.0108	529.3	1.9882	0.0101	527.5	1.9787	0.0095	525.7	1.9694	130
135	0.0118	536.8	2.0124	0.0110	535.2	2.0028	0.0103	533.5	1.9935	0.0097	531.8	1.9844	135
140	0.0120	542.6	2.0265	0.0112	541.0	2.0171	0.0105	539.4	2.0079	0.0099	537.8	1.9990	140
145	0.0122	548.4	2.0404	0.0115	546.9	2.0311	0.0108	545.3	2.0221	0.0101	543.8	2.0134	145
150	0.0125	554.1	2.0540	0.0117	552.7	2.0449	0.0110	551.2	2.0360	0.0103	549.7	2.0275	150
155	0.0127	559.8	2.0674	0.0119	558.4	2.0584	0.0112	557.0	2.0497	0.0106	555.6	2.0413	155
160	0.0129	565.5	2.0807	0.0121	564.2	2.0718	0.0114	562.8	2.0632	0.0108	561.4	2.0549	160
165	0.0132	571.2	2.0937	0.0123	569.9	2.0849	0.0116	568.6	2.0765	0.0110	567.3	2.0683	165
170	0.0134	576.9	2.1066	0.0126	575.6	2.0979	0.0118	574.4	2.0896	0.0112	573.1	2.0815	170
175	0.0136	582.6	2.1193	0.0128	581.4	2.1108	0.0120	580.1	2.1025	0.0114	578.9	2.0946	175
180	0.0138	588.2	2.1319	0.0130	587.1	2.1234	0.0122	585.9	2.1153	0.0116	584.7	2.1074	180
185	0.0140	593.9	2.1444	0.0132	592.8	2.1360	0.0124	591.6	2.1279	0.0117	590.5	2.1201	185
190	0.0143	599.6	2.1567	0.0134	598.5	2.1484	0.0126	597.4	2.1404	0.0119	596.3	2.1327	190
195	0.0145	605.3	2.1689	0.0136	604.2	2.1607	0.0128	603.1	2.1527	0.0121	602.1	2.1451	195
200	0.0147	611.0	2.1810	0.0138	609.9	2.1728	0.0130	608.9	2.1649	0.0123	607.8	2.1574	200
205	0.0149	616.7	2.1930	0.0140	615.7	2.1849	0.0132	614.6	2.1771	0.0125	613.6	2.1696	205
210				0.0142	621.4	2.1968	0.0134	620.4	2.1891	0.0127	619.4	2.1816	210
215										0.0129	625.2	2.1936	215



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