



DuPont™ ISCEON® 9 Series

REFRIGERANTS

Technical Information

Thermodynamic Properties of DuPont™ ISCEON® M059 (R-417A) SI Units



The miracles of science™

Thermodynamic Properties of DuPont™ ISCEON® MO59 (R-417A) Refrigerant (R-125/R-134a/R-600 – 46.6/50/0/3.4% by weight)

SI Units

Tables of the thermodynamic properties of ISCEON® MO59 (R-417A) have been developed and are presented here. This information is based on values calculated using the NIST REFPROP Database (McLinden, M.O., Klein, S.A., Lemmon, E.W., and Peskin, A.P., NIST Standard Reference Database 23, NIST thermodynamic and transport properties of refrigerants and refrigerant mixtures – REFPROP version 7.0, Standard Reference Data Program, National Institute of Standards and Technology, 2005).

Units

P = Pressure in kPa (absolute)

T = Temperature in Celsius

V_f = Fluid (liquid) specific volume in cubic Meters per kilogram

V_g = Vapour (gas) specific volume in cubic Meters per kilogram

d_f = Density of saturated vapour in kilograms per cubic meter

d_g = Density of saturated liquid in kilograms per cubic meter

h = Enthalpy (kJ/kg)

s = Entropy (kJ/kg·K)

Reference points for Enthalpy and Entropy:

h_f = 200 kJ/kg at 0°C

s_f = 1 kJ/kg·K at 0°C

Physical Properties

Chemical Formula	CHF ₂ CF ₃ /CH ₂ FCF ₃ /CH ₃ CH ₂ CH ₂ CH ₃ (46.6/50.0/3.4% by weight)
Molecular mass	106.75
Boiling Point At one atmosphere	-39.12°C
Critical Temperature	87.04°C
Critical Pressure	4036 kPa

Table 1
DuPont™ ISCEON® MO59 (R-417A) Saturation Properties—Temperature Table

TEMP. °C	PRESSURE (kPa)		VOLUME (m ³ /kg)		DENSITY (kg/m ³)		ENTHALPY (kJ/kg)			ENTROPY (kJ/K·kg)		TEMP. °C
	LIQUID	VAPOUR	LIQUID v _l	VAPOUR v _g	LIQUID d _l	VAPOUR d _g	LIQUID h _l	LATENT h _{lg}	VAPOUR h _g	LIQUID s _l	VAPOUR s _g	
-100	1.8	0.9	0.0006	14.6370	1562.1	0.068	75.9	233.5	309.3	0.4378	1.8120	-100
-99	2.0	1.0	0.0006	13.2540	1559.1	0.075	77.1	232.8	309.9	0.4448	1.8073	-99
-98	2.2	1.1	0.0006	12.0180	1556.1	0.083	78.3	232.2	310.5	0.4517	1.8026	-98
-97	2.4	1.3	0.0006	10.9130	1553.1	0.092	79.5	231.6	311.1	0.4586	1.7981	-97
-96	2.6	1.4	0.0006	9.9230	1550.1	0.101	80.7	231.0	311.7	0.4655	1.7937	-96
-95	2.8	1.5	0.0006	9.0351	1547.1	0.111	81.9	230.4	312.3	0.4723	1.7893	-95
-94	3.1	1.7	0.0006	8.2375	1544.1	0.121	83.2	229.8	312.9	0.4790	1.7851	-94
-93	3.4	1.9	0.0006	7.5201	1541.1	0.133	84.4	229.2	313.5	0.4858	1.7810	-93
-92	3.7	2.0	0.0007	6.8738	1538.1	0.145	85.6	228.6	314.1	0.4924	1.7769	-92
-91	4.0	2.2	0.0007	6.2909	1535.2	0.159	86.8	228.0	314.7	0.4991	1.7730	-91
-90	4.3	2.5	0.0007	5.7645	1532.2	0.173	88.0	227.4	315.3	0.5057	1.7691	-90
-89	4.7	2.7	0.0007	5.2885	1529.3	0.189	89.2	226.8	316.0	0.5122	1.7653	-89
-88	5.1	3.0	0.0007	4.8575	1526.3	0.206	90.4	226.2	316.6	0.5187	1.7616	-88
-87	5.5	3.2	0.0007	4.4668	1523.4	0.224	91.6	225.6	317.2	0.5252	1.7580	-87
-86	6.0	3.5	0.0007	4.1121	1520.4	0.243	92.8	225.0	317.8	0.5316	1.7545	-86
-85	6.5	3.9	0.0007	3.7898	1517.5	0.264	94.0	224.4	318.4	0.5380	1.7510	-85
-84	7.0	4.2	0.0007	3.4966	1514.5	0.286	95.2	223.8	319.0	0.5444	1.7476	-84
-83	7.5	4.6	0.0007	3.2295	1511.6	0.310	96.4	223.2	319.6	0.5507	1.7443	-83
-82	8.1	5.0	0.0007	2.9860	1508.7	0.335	97.6	222.7	320.3	0.5570	1.7411	-82
-81	8.7	5.4	0.0007	2.7636	1505.7	0.362	98.8	222.1	320.9	0.5633	1.7380	-81
-80	9.4	5.8	0.0007	2.5604	1502.8	0.391	100.0	221.5	321.5	0.5695	1.7349	-80
-79	10.1	6.3	0.0007	2.3745	1499.9	0.421	101.2	220.9	322.1	0.5757	1.7319	-79
-78	10.8	6.9	0.0007	2.2043	1496.9	0.454	102.4	220.3	322.7	0.5819	1.7290	-78
-77	11.6	7.4	0.0007	2.0482	1494.0	0.488	103.6	219.8	323.4	0.5880	1.7261	-77
-76	12.5	8.0	0.0007	1.9049	1491.1	0.525	104.8	219.2	324.0	0.5941	1.7233	-76
-75	13.4	8.6	0.0007	1.7733	1488.1	0.564	106.0	218.6	324.6	0.6002	1.7206	-75
-74	14.3	9.3	0.0007	1.6523	1485.2	0.605	107.2	218.0	325.2	0.6062	1.7179	-74
-73	15.3	10.0	0.0007	1.5409	1482.3	0.649	108.4	217.5	325.9	0.6123	1.7153	-73
-72	16.4	10.8	0.0007	1.4383	1479.3	0.695	109.6	216.9	326.5	0.6183	1.7127	-72
-71	17.5	11.6	0.0007	1.3436	1476.4	0.744	110.8	216.3	327.1	0.6242	1.7102	-71
-70	18.6	12.5	0.0007	1.2562	1473.5	0.796	112.0	215.7	327.7	0.6302	1.7078	-70
-69	19.9	13.4	0.0007	1.1755	1470.5	0.851	113.2	215.2	328.4	0.6361	1.7054	-69
-68	21.2	14.4	0.0007	1.1009	1467.6	0.908	114.4	214.6	329.0	0.6419	1.7031	-68
-67	22.5	15.4	0.0007	1.0318	1464.6	0.969	115.6	214.0	329.6	0.6478	1.7009	-67
-66	24.0	16.5	0.0007	0.9678	1461.7	1.033	116.8	213.4	330.3	0.6536	1.6986	-66
-65	25.5	17.6	0.0007	0.9085	1458.7	1.101	118.0	212.9	330.9	0.6595	1.6965	-65
-64	27.1	18.8	0.0007	0.8534	1455.8	1.172	119.3	212.3	331.5	0.6652	1.6944	-64
-63	28.8	20.1	0.0007	0.8023	1452.8	1.246	120.5	211.7	332.2	0.6710	1.6923	-63
-62	30.5	21.5	0.0007	0.7548	1449.9	1.325	121.7	211.1	332.8	0.6767	1.6903	-62
-61	32.4	22.9	0.0007	0.7106	1446.9	1.407	122.9	210.5	333.4	0.6825	1.6884	-61
-60	34.3	24.4	0.0007	0.6695	1443.9	1.494	124.1	210.0	334.1	0.6881	1.6865	-60
-59	36.4	26.0	0.0007	0.6311	1440.9	1.585	125.3	209.4	334.7	0.6938	1.6846	-59
-58	38.5	27.7	0.0007	0.5954	1438.0	1.680	126.5	208.8	335.3	0.6995	1.6828	-58
-57	40.7	29.4	0.0007	0.5621	1435.0	1.779	127.7	208.2	336.0	0.7051	1.6810	-57
-56	43.0	31.3	0.0007	0.5309	1432.0	1.883	129.0	207.6	336.6	0.7107	1.6793	-56
-55	45.5	33.2	0.0007	0.5019	1429.0	1.993	130.2	207.1	337.2	0.7163	1.6776	-55
-54	48.0	35.2	0.0007	0.4747	1426.0	2.107	131.4	206.5	337.9	0.7219	1.6760	-54
-53	50.7	37.4	0.0007	0.4492	1423.0	2.226	132.6	205.9	338.5	0.7274	1.6744	-53
-52	53.5	39.6	0.0007	0.4254	1420.0	2.351	133.8	205.3	339.1	0.7329	1.6728	-52
-51	56.3	41.9	0.0007	0.4031	1417.0	2.481	135.1	204.7	339.8	0.7384	1.6713	-51
-50	59.4	44.4	0.0007	0.3822	1414.0	2.617	136.3	204.1	340.4	0.7439	1.6698	-50
-49	62.5	47.0	0.0007	0.3626	1410.9	2.758	137.5	203.5	341.0	0.7494	1.6684	-49
-48	65.8	49.7	0.0007	0.3441	1407.9	2.906	138.7	202.9	341.7	0.7549	1.6670	-48
-47	69.2	52.5	0.0007	0.3268	1404.9	3.060	140.0	202.3	342.3	0.7603	1.6656	-47
-46	72.8	55.4	0.0007	0.3106	1401.8	3.220	141.2	201.7	342.9	0.7657	1.6643	-46
-45	76.5	58.5	0.0007	0.2953	1398.8	3.387	142.4	201.1	343.6	0.7711	1.6630	-45
-44	80.3	61.7	0.0007	0.2809	1395.7	3.561	143.7	200.5	344.2	0.7765	1.6617	-44
-43	84.3	65.0	0.0007	0.2673	1392.6	3.741	144.9	199.9	344.8	0.7819	1.6605	-43
-42	88.5	68.5	0.0007	0.2545	1389.5	3.929	146.1	199.3	345.4	0.7872	1.6593	-42
-41	92.8	72.1	0.0007	0.2425	1386.5	4.124	147.4	198.7	346.1	0.7925	1.6581	-41

Table 1 (continued)
DuPont™ ISCEON® MO59 (R-417A) Saturation Properties—Temperature Table

TEMP. °C	PRESSURE (kPa)		VOLUME (m ³ /kg)		DENSITY (kg/m ³)		ENTHALPY (kJ/kg)			ENTROPY (kJ/K·kg)		TEMP. °C
	LIQUID	VAPOUR	LIQUID v _f	VAPOUR v _g	LIQUID d _f	VAPOUR d _g	LIQUID h _f	LATENT h _{fg}	VAPOUR h _g	LIQUID s _f	VAPOUR s _g	
-40	97.2	75.9	0.0007	0.2311	1383.4	4.327	148.6	198.1	346.7	0.7979	1.6570	-40
-39	101.9	79.8	0.0007	0.2204	1380.3	4.538	149.9	197.5	347.3	0.8032	1.6559	-39
-38	106.7	83.9	0.0007	0.2103	1377.1	4.756	151.1	196.9	348.0	0.8084	1.6548	-38
-37	111.7	88.1	0.0007	0.2007	1374.0	4.983	152.3	196.3	348.6	0.8137	1.6537	-37
-36	116.9	92.6	0.0007	0.1916	1370.9	5.218	153.6	195.6	349.2	0.8190	1.6527	-36
-35	122.3	97.2	0.0007	0.1831	1367.8	5.462	154.8	195.0	349.8	0.8242	1.6517	-35
-34	127.8	102.0	0.0007	0.1750	1364.6	5.715	156.1	194.4	350.5	0.8294	1.6508	-34
-33	133.6	106.9	0.0007	0.1673	1361.5	5.977	157.3	193.7	351.1	0.8346	1.6498	-33
-32	139.5	112.1	0.0007	0.1600	1358.3	6.248	158.6	193.1	351.7	0.8398	1.6489	-32
-31	145.7	117.4	0.0007	0.1532	1355.1	6.529	159.9	192.5	352.3	0.8450	1.6480	-31
-30	152.1	122.9	0.0007	0.1466	1351.9	6.820	161.1	191.8	352.9	0.8502	1.6471	-30
-29	158.6	128.7	0.0007	0.1404	1348.7	7.121	162.4	191.2	353.6	0.8554	1.6463	-29
-28	165.5	134.6	0.0007	0.1346	1345.5	7.432	163.6	190.6	354.2	0.8605	1.6455	-28
-27	172.5	140.8	0.0007	0.1290	1342.3	7.754	164.9	189.9	354.8	0.8656	1.6447	-27
-26	179.7	147.2	0.0007	0.1237	1339.1	8.086	166.2	189.3	355.4	0.8707	1.6439	-26
-25	187.2	153.8	0.0007	0.1186	1335.8	8.430	167.4	188.6	356.0	0.8758	1.6432	-25
-24	195.0	160.6	0.0008	0.1138	1332.5	8.785	168.7	187.9	356.6	0.8809	1.6424	-24
-23	203.0	167.7	0.0008	0.1093	1329.3	9.152	170.0	187.3	357.3	0.8860	1.6417	-23
-22	211.2	175.0	0.0008	0.1049	1326.0	9.531	171.3	186.6	357.9	0.8911	1.6410	-22
-21	219.7	182.5	0.0008	0.1008	1322.7	9.922	172.5	185.9	358.5	0.8961	1.6404	-21
-20	228.4	190.3	0.0008	0.0968	1319.4	10.325	173.8	185.3	359.1	0.9012	1.6397	-20
-19	237.4	198.4	0.0008	0.0931	1316.1	10.742	175.1	184.6	359.7	0.9062	1.6391	-19
-18	246.7	206.7	0.0008	0.0895	1312.7	11.171	176.4	183.9	360.3	0.9112	1.6385	-18
-17	256.3	215.3	0.0008	0.0861	1309.4	11.614	177.7	183.2	360.9	0.9163	1.6379	-17
-16	266.1	224.1	0.0008	0.0828	1306.0	12.071	179.0	182.5	361.5	0.9213	1.6373	-16
-15	276.3	233.3	0.0008	0.0797	1302.7	12.542	180.3	181.8	362.1	0.9263	1.6368	-15
-14	286.7	242.7	0.0008	0.0768	1299.3	13.027	181.6	181.1	362.7	0.9312	1.6362	-14
-13	297.4	252.4	0.0008	0.0739	1295.9	13.527	182.9	180.4	363.3	0.9362	1.6357	-13
-12	308.4	262.4	0.0008	0.0712	1292.4	14.042	184.2	179.7	363.9	0.9412	1.6352	-12
-11	319.8	272.7	0.0008	0.0686	1289.0	14.572	185.5	179.0	364.5	0.9461	1.6347	-11
-10	331.4	283.3	0.0008	0.0661	1285.5	15.118	186.8	178.3	365.1	0.9511	1.6342	-10
-9	343.4	294.3	0.0008	0.0638	1282.1	15.680	188.1	177.6	365.6	0.9560	1.6337	-9
-8	355.7	305.5	0.0008	0.0615	1278.6	16.259	189.4	176.8	366.2	0.9609	1.6333	-8
-7	368.4	317.1	0.0008	0.0593	1275.1	16.854	190.7	176.1	366.8	0.9658	1.6328	-7
-6	381.3	329.0	0.0008	0.0573	1271.5	17.467	192.0	175.4	367.4	0.9707	1.6324	-6
-5	394.7	341.3	0.0008	0.0553	1268.0	18.098	193.4	174.6	368.0	0.9756	1.6320	-5
-4	408.3	353.9	0.0008	0.0533	1264.4	18.746	194.7	173.9	368.5	0.9805	1.6316	-4
-3	422.3	366.8	0.0008	0.0515	1260.9	19.414	196.0	173.1	369.1	0.9854	1.6312	-3
-2	436.7	380.1	0.0008	0.0498	1257.3	20.100	197.3	172.3	369.7	0.9903	1.6308	-2
-1	451.5	393.8	0.0008	0.0481	1253.7	20.805	198.7	171.6	370.2	0.9951	1.6304	-1
0	466.6	407.8	0.0008	0.0464	1250.0	21.530	200.0	170.8	370.8	1.0000	1.6301	0
1	482.1	422.2	0.0008	0.0449	1246.4	22.275	201.3	170.0	371.4	1.0049	1.6297	1
2	498.0	437.0	0.0008	0.0434	1242.7	23.042	202.7	169.2	371.9	1.0097	1.6294	2
3	514.3	452.2	0.0008	0.0420	1239.0	23.829	204.0	168.5	372.5	1.0145	1.6290	3
4	531.0	467.8	0.0008	0.0406	1235.2	24.638	205.4	167.7	373.0	1.0194	1.6287	4
5	548.1	483.7	0.0008	0.0393	1231.5	25.469	206.7	166.9	373.6	1.0242	1.6284	5
6	565.6	500.1	0.0008	0.0380	1227.7	26.323	208.1	166.0	374.1	1.0290	1.6281	6
7	583.6	517.0	0.0008	0.0368	1223.9	27.201	209.5	165.2	374.7	1.0338	1.6278	7
8	601.9	534.2	0.0008	0.0356	1220.1	28.102	210.8	164.4	375.2	1.0386	1.6275	8
9	620.7	551.8	0.0008	0.0345	1216.3	29.027	212.2	163.6	375.8	1.0434	1.6272	9
10	639.9	569.9	0.0008	0.0334	1212.4	29.978	213.6	162.7	376.3	1.0482	1.6269	10
11	659.6	588.5	0.0008	0.0323	1208.5	30.954	214.9	161.9	376.8	1.0530	1.6266	11
12	679.7	607.5	0.0008	0.0313	1204.6	31.957	216.3	161.0	377.3	1.0578	1.6264	12
13	700.3	626.9	0.0008	0.0303	1200.7	32.987	217.7	160.2	377.9	1.0626	1.6261	13
14	721.3	646.9	0.0008	0.0294	1196.7	34.044	219.1	159.3	378.4	1.0674	1.6258	14
15	742.8	667.3	0.0008	0.0285	1192.7	35.129	220.5	158.4	378.9	1.0722	1.6256	15
16	764.8	688.1	0.0008	0.0276	1188.6	36.244	221.9	157.5	379.4	1.0769	1.6253	16
17	787.2	709.5	0.0008	0.0267	1184.6	37.388	223.3	156.6	379.9	1.0817	1.6250	17
18	810.2	731.3	0.0008	0.0259	1180.5	38.563	224.7	155.7	380.4	1.0865	1.6248	18
19	833.6	753.7	0.0009	0.0251	1176.3	39.769	226.1	154.8	380.9	1.0912	1.6245	19

Table 1 (continued)
DuPont™ ISCEON® MO59 (R-417A) Saturation Properties—Temperature Table

TEMP. °C	PRESSURE (kPa)		VOLUME (m ³ /kg)		DENSITY (kg/m ³)		ENTHALPY (kJ/kg)			ENTROPY (kJ/K·kg)		TEMP. °C
	LIQUID	VAPOUR	LIQUID v _l	VAPOUR v _g	LIQUID d _l	VAPOUR d _g	LIQUID h _l	LATENT h _{lg}	VAPOUR h _g	LIQUID s _l	VAPOUR s _g	
20	857.6	776.6	0.0009	0.0244	1172.2	41.007	227.5	153.9	381.4	1.0960	1.6243	20
21	882.1	799.9	0.0009	0.0237	1168.0	42.278	228.9	153.0	381.9	1.1008	1.6240	21
22	907.1	823.8	0.0009	0.0229	1163.8	43.584	230.3	152.0	382.4	1.1055	1.6238	22
23	932.6	848.3	0.0009	0.0223	1159.5	44.924	231.8	151.1	382.8	1.1103	1.6235	23
24	958.6	873.3	0.0009	0.0216	1155.2	46.300	233.2	150.1	383.3	1.1150	1.6232	24
25	985.2	898.8	0.0009	0.0210	1150.9	47.712	234.6	149.1	383.8	1.1198	1.6230	25
26	1012.3	924.9	0.0009	0.0203	1146.5	49.163	236.1	148.2	384.2	1.1245	1.6227	26
27	1040.0	951.5	0.0009	0.0197	1142.1	50.653	237.5	147.2	384.7	1.1293	1.6224	27
28	1068.2	978.7	0.0009	0.0192	1137.6	52.182	239.0	146.1	385.1	1.1340	1.6222	28
29	1097.0	1006.5	0.0009	0.0186	1133.1	53.753	240.4	145.1	385.6	1.1388	1.6219	29
30	1126.4	1034.9	0.0009	0.0181	1128.6	55.367	241.9	144.1	386.0	1.1435	1.6216	30
31	1156.4	1063.9	0.0009	0.0175	1124.0	57.024	243.4	143.1	386.4	1.1483	1.6213	31
32	1187.0	1093.5	0.0009	0.0170	1119.3	58.727	244.9	142.0	386.9	1.1530	1.6210	32
33	1218.1	1123.7	0.0009	0.0165	1114.6	60.476	246.3	140.9	387.3	1.1578	1.6207	33
34	1249.9	1154.5	0.0009	0.0161	1109.9	62.273	247.8	139.9	387.7	1.1626	1.6204	34
35	1282.3	1185.9	0.0009	0.0156	1105.1	64.120	249.3	138.8	388.1	1.1673	1.6201	35
36	1315.3	1218.0	0.0009	0.0151	1100.3	66.018	250.8	137.7	388.5	1.1721	1.6198	36
37	1348.9	1250.8	0.0009	0.0147	1095.4	67.969	252.3	136.5	388.9	1.1769	1.6194	37
38	1383.2	1284.2	0.0009	0.0143	1090.4	69.975	253.8	135.4	389.2	1.1816	1.6191	38
39	1418.1	1318.2	0.0009	0.0139	1085.4	72.037	255.4	134.2	389.6	1.1864	1.6187	39
40	1453.6	1353.0	0.0009	0.0135	1080.4	74.159	256.9	133.1	390.0	1.1912	1.6183	40
41	1489.8	1388.4	0.0009	0.0131	1075.2	76.341	258.4	131.9	390.3	1.1960	1.6179	41
42	1526.7	1424.5	0.0009	0.0127	1070.0	78.586	260.0	130.7	390.6	1.2008	1.6175	42
43	1564.3	1461.3	0.0009	0.0124	1064.8	80.897	261.5	129.4	391.0	1.2056	1.6171	43
44	1602.6	1498.9	0.0009	0.0120	1059.4	83.276	263.1	128.2	391.3	1.2104	1.6167	44
45	1641.5	1537.1	0.0009	0.0117	1054.0	85.726	264.7	126.9	391.6	1.2152	1.6162	45
46	1681.2	1576.1	0.0010	0.0113	1048.5	88.249	266.2	125.7	391.9	1.2201	1.6158	46
47	1721.5	1615.8	0.0010	0.0110	1043.0	90.849	267.8	124.4	392.2	1.2249	1.6153	47
48	1762.6	1656.3	0.0010	0.0107	1037.3	93.529	269.4	123.0	392.5	1.2298	1.6148	48
49	1804.5	1697.6	0.0010	0.0104	1031.6	96.292	271.0	121.7	392.7	1.2346	1.6142	49
50	1847.0	1739.6	0.0010	0.0101	1025.8	99.143	272.6	120.3	393.0	1.2395	1.6137	50
51	1890.3	1782.5	0.0010	0.0098	1019.9	102.080	274.3	118.9	393.2	1.2444	1.6131	51
52	1934.4	1826.1	0.0010	0.0095	1013.9	105.120	275.9	117.5	393.4	1.2493	1.6125	52
53	1979.2	1870.5	0.0010	0.0092	1007.7	108.260	277.6	116.1	393.6	1.2542	1.6118	53
54	2024.8	1915.8	0.0010	0.0090	1001.5	111.500	279.2	114.6	393.8	1.2592	1.6111	54
55	2071.2	1961.9	0.0010	0.0087	995.2	114.850	280.9	113.1	394.0	1.2641	1.6104	55
56	2118.4	2008.9	0.0010	0.0085	988.7	118.320	282.6	111.6	394.2	1.2691	1.6097	56
57	2166.4	2056.7	0.0010	0.0082	982.1	121.920	284.3	110.0	394.3	1.2741	1.6089	57
58	2215.3	2105.4	0.0010	0.0080	975.4	125.640	286.0	108.4	394.4	1.2792	1.6081	58
59	2264.9	2155.0	0.0010	0.0077	968.5	129.500	287.7	106.8	394.5	1.2842	1.6072	59
60	2315.4	2205.5	0.0010	0.0075	961.5	133.510	289.5	105.2	394.6	1.2893	1.6063	60
61	2366.8	2256.9	0.0010	0.0073	954.3	137.670	291.2	103.4	394.7	1.2944	1.6053	61
62	2419.0	2309.2	0.0011	0.0070	946.9	142.000	293.0	101.7	394.7	1.2996	1.6043	62
63	2472.0	2362.5	0.0011	0.0068	939.4	146.510	294.8	99.9	394.7	1.3048	1.6032	63
64	2526.0	2416.8	0.0011	0.0066	931.6	151.200	296.6	98.1	394.7	1.3100	1.6021	64
65	2580.9	2472.1	0.0011	0.0064	923.6	156.110	298.5	96.2	394.6	1.3153	1.6009	65
66	2636.6	2528.4	0.0011	0.0062	915.4	161.230	300.3	94.2	394.5	1.3206	1.5996	66
67	2693.4	2585.7	0.0011	0.0060	907.0	166.600	302.2	92.2	394.4	1.3260	1.5982	67
68	2751.0	2644.1	0.0011	0.0058	898.2	172.230	304.1	90.2	394.3	1.3314	1.5967	68
69	2809.6	2703.6	0.0011	0.0056	889.2	178.140	306.1	88.0	394.1	1.3369	1.5952	69
70	2869.1	2764.2	0.0011	0.0054	879.8	184.370	308.0	85.8	393.8	1.3425	1.5935	70
71	2929.7	2825.9	0.0011	0.0052	870.1	190.960	310.1	83.5	393.5	1.3481	1.5917	71
72	2991.2	2888.7	0.0012	0.0051	859.9	197.930	312.1	81.1	393.2	1.3539	1.5897	72
73	3053.7	2952.8	0.0012	0.0049	849.3	205.340	314.2	78.6	392.8	1.3597	1.5876	73
74	3117.3	3018.1	0.0012	0.0047	838.1	213.240	316.4	76.0	392.3	1.3657	1.5853	74
75	3181.9	3084.7	0.0012	0.0045	826.3	221.720	318.6	73.2	391.7	1.3718	1.5828	75
76	3247.5	3152.7	0.0012	0.0043	813.8	230.860	320.8	70.3	391.1	1.3781	1.5801	76
77	3314.2	3222.0	0.0012	0.0042	800.5	240.780	323.2	67.2	390.3	1.3846	1.5771	77
78	3381.9	3292.8	0.0013	0.0040	786.1	251.630	325.6	63.8	389.4	1.3913	1.5737	78
79	3450.8	3365.2	0.0013	0.0038	770.5	263.640	328.2	60.2	388.4	1.3984	1.5699	79

Table 1 (continued)
DuPont™ ISCEON® MO59 (R-417A) Saturation Properties—Temperature Table

TEMP. °C	PRESSURE (kPa)		VOLUME (m ³ /kg)		DENSITY (kg/m ³)		ENTHALPY (kJ/kg)			ENTROPY (kJ/K·kg)		TEMP. °C
	LIQUID	VAPOUR	LIQUID v _l	VAPOUR v _g	LIQUID d _l	VAPOUR d _g	LIQUID h _l	LATENT h _{lg}	VAPOUR h _g	LIQUID s _l	VAPOUR s _g	
80	3520.7	3439.2	0.0013	0.0036	753.2	277.130	330.9	56.2	387.1	1.4058	1.5656	80
81	3591.6	3515.1	0.0014	0.0034	733.7	292.560	333.8	51.8	385.6	1.4138	1.5606	81
82	3663.4	3593.1	0.0014	0.0032	711.1	310.740	337.0	46.7	383.7	1.4226	1.5545	82
83	3736.0	3673.6	0.0015	0.0030	683.4	333.210	340.7	40.6	381.3	1.4327	1.5470	83
84	3808.7	3757.5	0.0015	0.0027	645.7	363.680	345.4	32.4	377.8	1.4454	1.5365	84
85	3877.7	3848.5	0.0017	0.0024	575.5	418.590	353.3	18.0	371.3	1.4672	1.5175	85

Table 2
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa

TEMP. °C	10			20			30			40			TEMP. °C
	(-73.05°C)			(-63.10°C)			(-56.68°C)			(-51.83°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(1.5458)	(325.8)	(1.7154)	(0.8071)	(332.1)	(1.6925)	(0.5519)	(336.2)	(1.6805)	(0.4215)	(339.2)	(1.6726)	
-70	1.5702	327.9	1.7255	-	-	-	-	-	-	-	-	-	-70
-65	1.6101	331.3	1.7420	-	-	-	-	-	-	-	-	-	-65
-60	1.6498	334.7	1.7582	0.8196	334.3	1.7027	-	-	-	-	-	-	-60
-55	1.6895	338.2	1.7743	0.8398	337.8	1.7190	0.5565	337.4	1.6860	-	-	-	-55
-50	1.7290	341.7	1.7902	0.8599	341.3	1.7350	0.5702	340.9	1.7022	0.4253	340.6	1.6785	-50
-45	1.7686	345.2	1.8060	0.8800	344.9	1.7509	0.5838	344.5	1.7182	0.4356	344.2	1.6947	-45
-40	1.8080	348.8	1.8216	0.9000	348.5	1.7667	0.5973	348.2	1.7341	0.4459	347.9	1.7106	-40
-35	1.8474	352.5	1.8371	0.9199	352.2	1.7822	0.6107	351.9	1.7497	0.4561	351.6	1.7264	-35
-30	1.8868	356.2	1.8525	0.9398	355.9	1.7977	0.6242	355.6	1.7653	0.4663	355.4	1.7420	-30
-25	1.9262	359.9	1.8677	0.9597	359.7	1.8130	0.6375	359.4	1.7806	0.4765	359.1	1.7574	-25
-20	1.9655	363.7	1.8828	0.9795	363.5	1.8281	0.6509	363.2	1.7958	0.4866	363.0	1.7727	-20
-15	2.0047	367.5	1.8978	0.9994	367.3	1.8432	0.6642	367.1	1.8109	0.4966	366.8	1.7879	-15
-10	2.0440	371.4	1.9127	1.0191	371.2	1.8581	0.6775	371.0	1.8259	0.5067	370.8	1.8029	-10
-5	2.0832	375.3	1.9274	1.0389	375.1	1.8729	0.6908	374.9	1.8408	0.5167	374.7	1.8178	-5
0	2.1224	379.3	1.9421	1.0586	379.1	1.8876	0.7040	378.9	1.8555	0.5267	378.7	1.8326	0
5	2.1616	383.3	1.9566	1.0783	383.1	1.9022	0.7172	382.9	1.8701	0.5367	382.8	1.8472	5
10	2.2008	387.4	1.9711	1.0980	387.2	1.9167	0.7305	387.0	1.8846	0.5467	386.8	1.8618	10
15	2.2399	391.5	1.9854	1.1177	391.3	1.9310	0.7436	391.1	1.8990	0.5566	391.0	1.8762	15
20	2.2791	395.6	1.9997	1.1374	395.4	1.9453	0.7568	395.3	1.9134	0.5665	395.1	1.8906	20
25	2.3182	399.8	2.0139	1.1570	399.6	1.9595	0.7700	399.5	1.9276	0.5765	399.3	1.9048	25
30	2.3573	404.0	2.0279	1.1767	403.9	1.9736	0.7832	403.7	1.9417	0.5864	403.6	1.9190	30
35	2.3964	408.3	2.0419	1.1963	408.2	1.9876	0.7963	408.0	1.9557	0.5963	407.9	1.9330	35
40	2.4355	412.6	2.0559	1.2160	412.5	2.0016	0.8094	412.4	1.9697	0.6062	412.2	1.9470	40
45	2.4746	417.0	2.0697	1.2356	416.9	2.0154	0.8226	416.7	1.9835	0.6161	416.6	1.9609	45
50	2.5137	421.4	2.0834	1.2552	421.3	2.0292	0.8357	421.2	1.9973	0.6259	421.0	1.9746	50
55	2.5528	425.8	2.0971	1.2748	425.7	2.0428	0.8488	425.6	2.0110	0.6358	425.5	1.9884	55
60	2.5918	430.3	2.1107	1.2944	430.2	2.0564	0.8619	430.1	2.0246	0.6457	430.0	2.0020	60
65	2.6309	434.9	2.1242	1.3140	434.8	2.0700	0.8750	434.7	2.0382	0.6555	434.6	2.0155	65
70	2.6700	439.5	2.1376	1.3336	439.4	2.0834	0.8881	439.2	2.0516	0.6654	439.1	2.0290	70
75	2.7090	444.1	2.1510	1.3531	444.0	2.0968	0.9012	443.9	2.0650	0.6752	443.8	2.0424	75
80	2.7480	448.7	2.1643	1.3727	448.6	2.1101	0.9143	448.5	2.0783	0.6850	448.4	2.0557	80

ABSOLUTE PRESSURE, kPa

TEMP. °C	50			60			70			80			TEMP. °C
	(-47.87°C)			(-44.51°C)			(-41.57°C)			(-38.95°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.3419)	(341.7)	(1.6668)	(0.2881)	(343.9)	(1.6624)	(0.2493)	(345.7)	(1.6588)	(0.2199)	(347.4)	(1.6558)	
-45	0.3467	343.9	1.6762	-	-	-	-	-	-	-	-	-	-45
-40	0.3551	347.6	1.6922	0.2945	347.2	1.6770	0.2512	346.9	1.6639	-	-	-	-40
-35	0.3634	351.3	1.7081	0.3015	351.0	1.6929	0.2573	350.7	1.6800	0.2241	350.4	1.6686	-35
-30	0.3716	355.1	1.7238	0.3084	354.8	1.7087	0.2633	354.5	1.6958	0.2295	354.2	1.6846	-30
-25	0.3798	358.9	1.7393	0.3153	358.6	1.7243	0.2693	358.4	1.7115	0.2347	358.1	1.7003	-25
-20	0.3879	362.7	1.7546	0.3222	362.5	1.7397	0.2752	362.2	1.7270	0.2400	362.0	1.7159	-20
-15	0.3961	366.6	1.7699	0.3290	366.4	1.7550	0.2811	366.2	1.7423	0.2452	365.9	1.7313	-15
-10	0.4042	370.5	1.7849	0.3358	370.3	1.7701	0.2870	370.1	1.7575	0.2504	369.9	1.7465	-10
-5	0.4123	374.5	1.7999	0.3426	374.3	1.7851	0.2929	374.1	1.7725	0.2556	373.9	1.7616	-5
0	0.4203	378.5	1.8147	0.3494	378.3	1.8000	0.2987	378.1	1.7874	0.2607	377.9	1.7765	0
5	0.4284	382.6	1.8294	0.3561	382.4	1.8147	0.3045	382.2	1.8022	0.2658	382.0	1.7913	5
10	0.4364	386.7	1.8440	0.3629	386.5	1.8293	0.3103	386.3	1.8169	0.2709	386.1	1.8060	10
15	0.4444	390.8	1.8584	0.3696	390.6	1.8438	0.3161	390.5	1.8314	0.2760	390.3	1.8206	15
20	0.4524	395.0	1.8728	0.3762	394.8	1.8582	0.3219	394.7	1.8458	0.2811	394.5	1.8350	20
25	0.4603	399.2	1.8871	0.3829	399.0	1.8725	0.3276	398.9	1.8601	0.2862	398.7	1.8494	25
30	0.4683	403.5	1.9012	0.3896	403.3	1.8867	0.3334	403.2	1.8743	0.2912	403.0	1.8636	30
35	0.4763	407.8	1.9153	0.3963	407.6	1.9008	0.3391	407.5	1.8885	0.2962	407.4	1.8777	35
40	0.4842	412.1	1.9293	0.4029	412.0	1.9148	0.3448	411.8	1.9025	0.3013	411.7	1.8918	40
45	0.4921	416.5	1.9432	0.4095	416.4	1.9287	0.3505	416.2	1.9164	0.3063	416.1	1.9057	45
50	0.5001	420.9	1.9570	0.4162	420.8	1.9425	0.3562	420.7	1.9303	0.3113	420.6	1.9196	50
55	0.5080	425.4	1.9707	0.4228	425.3	1.9563	0.3619	425.2	1.9440	0.3163	425.0	1.9334	55
60	0.5159	429.9	1.9844	0.4294	429.8	1.9699	0.3676	429.7	1.9577	0.3213	429.6	1.9470	60
65	0.5238	434.5	1.9979	0.4360	434.3	1.9835	0.3733	434.2	1.9713	0.3263	434.1	1.9606	65
70	0.5317	439.0	2.0114	0.4426	438.9	1.9970	0.3790	438.8	1.9848	0.3312	438.7	1.9742	70
75	0.5396	443.7	2.0248	0.4492	443.6	2.0104	0.3846	443.5	1.9982	0.3362	443.4	1.9876	75
80	0.5475	448.4	2.0381	0.4558	448.3	2.0238	0.3903	448.2	2.0115	0.3412	448.1	2.0010	80
85	0.5554	453.1	2.0514	0.4624	453.0	2.0370	0.3960	452.9	2.0248	0.3461	452.8	2.0142	85
90	0.5633	457.8	2.0646	0.4690	457.7	2.0502	0.4016	457.6	2.0380	0.3511	457.5	2.0275	90
95	0.5711	462.6	2.0777	0.4755	462.5	2.0633	0.4073	462.4	2.0512	0.3561	462.4	2.0406	95
100	0.5790	467.5	2.0908	0.4821	467.4	2.0764	0.4129	467.3	2.0642	0.3610	467.2	2.0537	100
105	0.5869	472.3	2.1037	0.4887	472.2	2.0894	0.4186	472.2	2.0772	0.3660	472.1	2.0667	105

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													
TEMP. °C	90			100			101.325			110			TEMP. °C
	(-36.58°C)			(-34.40°C)			(-34.13°C)			(-32.39°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.1968)	(348.8)	(1.6533)	(0.1782)	(350.2)	(1.6511)	(0.1760)	(350.4)	(1.6509)	(0.1629)	(351.5)	(1.6493)	
-35	0.1983	350.1	1.6584	—	—	—	—	—	—	—	—	—	-35
-30	0.2031	353.9	1.6745	0.1820	353.6	1.6654	0.1796	353.6	1.6642	0.1648	353.3	1.6570	-30
-25	0.2079	357.8	1.6903	0.1864	357.5	1.6813	0.1838	357.5	1.6802	0.1688	357.3	1.6730	-25
-20	0.2126	361.7	1.7060	0.1907	361.5	1.6970	0.1881	361.5	1.6959	0.1727	361.2	1.6888	-20
-15	0.2173	365.7	1.7214	0.1949	365.5	1.7125	0.1923	365.4	1.7114	0.1766	365.2	1.7044	-15
-10	0.2219	369.7	1.7367	0.1991	369.5	1.7279	0.1965	369.4	1.7268	0.1805	369.2	1.7198	-10
-5	0.2266	373.7	1.7518	0.2033	373.5	1.7430	0.2006	373.5	1.7419	0.1843	373.3	1.7350	-5
0	0.2312	377.7	1.7668	0.2075	377.6	1.7581	0.2047	377.5	1.7570	0.1881	377.4	1.7501	0
5	0.2357	381.8	1.7817	0.2117	381.7	1.7730	0.2088	381.6	1.7719	0.1919	381.5	1.7650	5
10	0.2403	386.0	1.7964	0.2158	385.8	1.7877	0.2129	385.8	1.7866	0.1957	385.6	1.7798	10
15	0.2448	390.1	1.8110	0.2199	390.0	1.8023	0.2170	390.0	1.8013	0.1995	389.8	1.7945	15
20	0.2494	394.3	1.8254	0.2240	394.2	1.8168	0.2210	394.2	1.8158	0.2032	394.0	1.8090	20
25	0.2539	398.6	1.8398	0.2281	398.4	1.8312	0.2250	398.4	1.8302	0.2070	398.3	1.8234	25
30	0.2584	402.9	1.8541	0.2322	402.7	1.8455	0.2291	402.7	1.8445	0.2107	402.6	1.8378	30
35	0.2629	407.2	1.8682	0.2362	407.1	1.8597	0.2331	407.1	1.8586	0.2144	406.9	1.8520	35
40	0.2674	411.6	1.8823	0.2403	411.4	1.8738	0.2371	411.4	1.8727	0.2181	411.3	1.8661	40
45	0.2719	416.0	1.8963	0.2443	415.9	1.8878	0.2411	415.8	1.8867	0.2218	415.7	1.8801	45
50	0.2763	420.4	1.9101	0.2484	420.3	1.9017	0.2451	420.3	1.9006	0.2255	420.2	1.8940	50
55	0.2808	424.9	1.9239	0.2524	424.8	1.9155	0.2490	424.8	1.9144	0.2291	424.7	1.9078	55
60	0.2852	429.5	1.9376	0.2564	429.3	1.9292	0.2530	429.3	1.9281	0.2328	429.2	1.9215	60
65	0.2897	434.0	1.9512	0.2604	433.9	1.9428	0.2570	433.9	1.9417	0.2365	433.8	1.9351	65
70	0.2941	438.6	1.9648	0.2644	438.5	1.9563	0.2609	438.5	1.9553	0.2401	438.4	1.9487	70
75	0.2985	443.3	1.9782	0.2684	443.2	1.9698	0.2649	443.2	1.9687	0.2438	443.1	1.9622	75
80	0.3030	448.0	1.9916	0.2724	447.9	1.9832	0.2688	447.9	1.9821	0.2474	447.8	1.9756	80
85	0.3074	452.7	2.0049	0.2764	452.6	1.9965	0.2728	452.6	1.9954	0.2510	452.5	1.9889	85
90	0.3118	457.5	2.0181	0.2804	457.4	2.0097	0.2767	457.4	2.0087	0.2547	457.3	2.0021	90
95	0.3162	462.3	2.0312	0.2844	462.2	2.0229	0.2806	462.2	2.0218	0.2583	462.1	2.0153	95
100	0.3206	467.1	2.0443	0.2883	467.0	2.0360	0.2845	467.0	2.0349	0.2619	467.0	2.0284	100
105	0.3250	472.0	2.0573	0.2923	471.9	2.0490	0.2885	471.9	2.0479	0.2655	471.8	2.0414	105
110	0.3295	476.9	2.0703	0.2963	476.9	2.0619	0.2924	476.8	2.0609	0.2692	476.8	2.0543	110
115	0.3339	481.9	2.0831	0.3003	481.8	2.0748	0.2963	481.8	2.0737	0.2728	481.7	2.0672	115

ABSOLUTE PRESSURE, kPa													
TEMP. °C	120			130			140			150			TEMP. °C
	(-30.53°C)			(-28.77°C)			(-27.13°C)			(25.57°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.1500)	(352.6)	(1.6476)	(0.1391)	(353.7)	(1.6461)	(0.1297)	(354.7)	(1.6448)	(0.1215)	(355.7)	(1.6436)	
-30	0.1504	353.0	1.6493	—	—	—	—	—	—	—	—	—	-30
-25	0.1541	357.0	1.6654	0.1417	356.7	1.6583	0.1310	356.4	1.6517	0.1218	356.1	1.6454	-25
-20	0.1578	361.0	1.6813	0.1451	360.7	1.6743	0.1342	360.4	1.6677	0.1248	360.2	1.6616	-20
-15	0.1614	365.0	1.6969	0.1485	364.7	1.6900	0.1374	364.5	1.6835	0.1278	364.2	1.6774	-15
-10	0.1649	369.0	1.7124	0.1518	368.8	1.7055	0.1405	368.5	1.6991	0.1307	368.3	1.6931	-10
-5	0.1685	373.1	1.7277	0.1551	372.8	1.7209	0.1436	372.6	1.7145	0.1336	372.4	1.7085	-5
0	0.1720	377.2	1.7428	0.1584	377.0	1.7360	0.1467	376.8	1.7297	0.1365	376.5	1.7238	0
5	0.1755	381.3	1.7578	0.1616	381.1	1.7510	0.1497	380.9	1.7448	0.1394	380.7	1.7389	5
10	0.1790	385.4	1.7726	0.1649	385.3	1.7659	0.1527	385.1	1.7597	0.1422	384.9	1.7538	10
15	0.1825	389.6	1.7873	0.1681	389.5	1.7806	0.1557	389.3	1.7744	0.1450	389.1	1.7686	15
20	0.1859	393.9	1.8018	0.1713	393.7	1.7952	0.1587	393.5	1.7890	0.1478	393.4	1.7833	20
25	0.1894	398.1	1.8163	0.1745	398.0	1.8097	0.1617	397.8	1.8035	0.1506	397.7	1.7978	25
30	0.1928	402.4	1.8306	0.1777	402.3	1.8240	0.1647	402.2	1.8179	0.1534	402.0	1.8122	30
35	0.1962	406.8	1.8448	0.1808	406.7	1.8383	0.1676	406.5	1.8322	0.1562	406.4	1.8265	35
40	0.1996	411.2	1.8590	0.1840	411.0	1.8524	0.1706	410.9	1.8463	0.1589	410.8	1.8407	40
45	0.2030	415.6	1.8730	0.1871	415.5	1.8665	0.1735	415.4	1.8604	0.1617	415.2	1.8547	45
50	0.2064	420.1	1.8869	0.1903	420.0	1.8804	0.1764	419.8	1.8744	0.1644	419.7	1.8687	50
55	0.2098	424.6	1.9007	0.1934	424.5	1.8942	0.1793	424.3	1.8882	0.1672	424.2	1.8826	55
60	0.2131	429.1	1.9145	0.1965	429.0	1.9080	0.1822	428.9	1.9020	0.1699	428.8	1.8964	60
65	0.2165	433.7	1.9281	0.1996	433.6	1.9217	0.1851	433.5	1.9157	0.1726	433.4	1.9101	65
70	0.2199	438.3	1.9417	0.2027	438.2	1.9352	0.1880	438.1	1.9293	0.1753	438.0	1.9237	70
75	0.2232	443.0	1.9552	0.2058	442.9	1.9487	0.1909	442.8	1.9428	0.1780	442.7	1.9372	75
80	0.2266	447.7	1.9686	0.2089	447.6	1.9622	0.1938	447.5	1.9562	0.1807	447.4	1.9506	80
85	0.2299	452.4	1.9819	0.2120	452.3	1.9755	0.1967	452.2	1.9695	0.1834	452.1	1.9640	85
90	0.2332	457.2	1.9952	0.2151	457.1	1.9887	0.1996	457.0	1.9828	0.1861	456.9	1.9772	90
95	0.2366	462.0	2.0083	0.2182	461.9	2.0019	0.2024	461.8	1.9960	0.1888	461.8	1.9904	95
100	0.2399	466.9	2.0214	0.2213	466.8	2.0150	0.2053	466.7	2.0091	0.1915	466.6	2.0036	100
105	0.2432	471.8	2.0345	0.2243	471.7	2.0281	0.2082	471.6	2.0221	0.1941	471.5	2.0166	105
110	0.2465	476.7	2.0474	0.2274	476.6	2.0410	0.2110	476.5	2.0351	0.1968	476.5	2.0296	110
115	0.2499	481.7	2.0603	0.2305	481.6	2.0539	0.2139	481.5	2.0480	0.1995	481.4	2.0425	115
120	0.2532	486.7	2.0731	0.2336	486.6	2.0668	0.2167	486.5	2.0608	0.2021	486.5	2.0553	120

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													
TEMP. °C	160			170			180			190			TEMP. °C
	(-24.09°C)			(-22.68°C)			(-21.33°C)			(-20.04°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.1142)	(356.6)	(1.6425)	(0.1078)	(357.5)	(1.6415)	(0.1021)	(358.3)	(1.6406)	(0.0970)	(359.1)	(1.6398)	
-20	0.1166	359.9	1.6557	0.1093	359.6	1.6502	0.1028	359.4	1.6449	0.0970	359.1	1.6399	-20
-15	0.1194	364.0	1.6717	0.1120	363.7	1.6662	0.1054	363.5	1.6611	0.0995	363.2	1.6561	-15
-10	0.1222	368.1	1.6874	0.1146	367.9	1.6820	0.1079	367.6	1.6769	0.1019	367.4	1.6720	-10
-5	0.1249	372.2	1.7029	0.1172	372.0	1.6976	0.1104	371.8	1.6925	0.1043	371.5	1.6877	-5
0	0.1276	376.3	1.7182	0.1198	376.1	1.7129	0.1128	375.9	1.7079	0.1066	375.7	1.7031	0
5	0.1303	380.5	1.7333	0.1224	380.3	1.7281	0.1153	380.1	1.7231	0.1089	379.9	1.7184	5
10	0.1330	384.7	1.7483	0.1249	384.5	1.7431	0.1177	384.4	1.7382	0.1112	384.2	1.7335	10
15	0.1357	389.0	1.7631	0.1274	388.8	1.7580	0.1201	388.6	1.7531	0.1135	388.4	1.7484	15
20	0.1383	393.2	1.7778	0.1299	393.1	1.7727	0.1225	392.9	1.7678	0.1158	392.7	1.7632	20
25	0.1410	397.5	1.7924	0.1324	397.4	1.7873	0.1248	397.2	1.7824	0.1180	397.1	1.7778	25
30	0.1436	401.9	1.8068	0.1349	401.7	1.8017	0.1272	401.6	1.7969	0.1203	401.4	1.7923	30
35	0.1462	406.2	1.8211	0.1374	406.1	1.8161	0.1295	406.0	1.8113	0.1225	405.8	1.8067	35
40	0.1488	410.6	1.8353	0.1398	410.5	1.8303	0.1318	410.4	1.8255	0.1247	410.2	1.8210	40
45	0.1514	415.1	1.8494	0.1423	415.0	1.8444	0.1341	414.8	1.8396	0.1269	414.7	1.8351	45
50	0.1539	419.6	1.8634	0.1447	419.5	1.8584	0.1365	419.3	1.8537	0.1291	419.2	1.8492	50
55	0.1565	424.1	1.8773	0.1471	424.0	1.8723	0.1388	423.9	1.8676	0.1313	423.8	1.8631	55
60	0.1591	428.7	1.8911	0.1495	428.6	1.8861	0.1410	428.4	1.8814	0.1335	428.3	1.8770	60
65	0.1616	433.3	1.9048	0.1519	433.2	1.8998	0.1433	433.0	1.8952	0.1356	432.9	1.8907	65
70	0.1642	437.9	1.9184	0.1543	437.8	1.9135	0.1456	437.7	1.9088	0.1378	437.6	1.9044	70
75	0.1667	442.6	1.9319	0.1567	442.5	1.9270	0.1479	442.4	1.9223	0.1399	442.3	1.9179	75
80	0.1693	447.3	1.9454	0.1591	447.2	1.9405	0.1501	447.1	1.9358	0.1421	447.0	1.9314	80
85	0.1718	452.0	1.9587	0.1615	452.0	1.9538	0.1524	451.9	1.9492	0.1442	451.8	1.9448	85
90	0.1743	456.8	1.9720	0.1639	456.7	1.9671	0.1547	456.7	1.9625	0.1464	456.6	1.9581	90
95	0.1768	461.7	1.9852	0.1663	461.6	1.9803	0.1569	461.5	1.9757	0.1485	461.4	1.9713	95
100	0.1793	466.5	1.9984	0.1687	466.5	1.9935	0.1592	466.4	1.9889	0.1507	466.3	1.9845	100
105	0.1819	471.4	2.0114	0.1710	471.4	2.0066	0.1614	471.3	2.0019	0.1528	471.2	1.9976	105
110	0.1844	476.4	2.0244	0.1734	476.3	2.0195	0.1636	476.2	2.0149	0.1549	476.1	2.0106	110
115	0.1869	481.4	2.0373	0.1758	481.3	2.0325	0.1659	481.2	2.0279	0.1570	481.1	2.0235	115
120	0.1894	486.4	2.0502	0.1781	486.3	2.0453	0.1681	486.2	2.0407	0.1592	486.2	2.0364	120
125	0.1919	491.4	2.0630	0.1805	491.4	2.0581	0.1703	491.3	2.0535	0.1613	491.2	2.0492	125
130	0.1944	496.5	2.0757	0.1828	496.5	2.0708	0.1726	496.4	2.0662	0.1634	496.3	2.0619	130

ABSOLUTE PRESSURE, kPa													
TEMP. °C	200			210			220			230			TEMP. °C
	(-18.80°C)			(-17.61°C)			(-16.46°C)			(-15.36°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.0924)	(359.8)	(1.6390)	(0.0882)	(360.5)	(1.6383)	(0.0843)	(361.2)	(1.6376)	(0.0808)	(361.9)	(1.637)	
-15	0.0942	363.0	1.6513	0.0893	362.7	1.6468	0.0850	362.4	1.6424	0.0810	362.2	1.6381	-15
-10	0.0965	367.1	1.6673	0.0916	366.9	1.6628	0.0871	366.7	1.6585	0.0830	366.4	1.6544	-10
-5	0.0987	371.3	1.6831	0.0938	371.1	1.6786	0.0892	370.9	1.6744	0.0851	370.6	1.6703	-5
0	0.1010	375.5	1.6986	0.0959	375.3	1.6942	0.0913	375.1	1.6900	0.0871	374.9	1.6860	0
5	0.1032	379.7	1.7139	0.0980	379.5	1.7096	0.0933	379.3	1.7054	0.0890	379.1	1.7014	5
10	0.1054	384.0	1.7290	0.1002	383.8	1.7247	0.0954	383.6	1.7206	0.0910	383.4	1.7167	10
15	0.1076	388.3	1.7440	0.1022	388.1	1.7397	0.0974	387.9	1.7357	0.0929	387.7	1.7317	15
20	0.1098	392.6	1.7588	0.1043	392.4	1.7546	0.0994	392.2	1.7505	0.0948	392.1	1.7466	20
25	0.1119	396.9	1.7735	0.1064	396.7	1.7693	0.1013	396.6	1.7653	0.0967	396.4	1.7614	25
30	0.1140	401.3	1.7880	0.1084	401.1	1.7838	0.1033	401.0	1.7798	0.0986	400.8	1.7760	30
35	0.1162	405.7	1.8024	0.1104	405.5	1.7983	0.1052	405.4	1.7943	0.1005	405.2	1.7905	35
40	0.1183	410.1	1.8167	0.1125	410.0	1.8126	0.1072	409.8	1.8086	0.1024	409.7	1.8048	40
45	0.1204	414.6	1.8308	0.1145	414.4	1.8267	0.1091	414.3	1.8228	0.1042	414.2	1.8191	45
50	0.1225	419.1	1.8449	0.1165	419.0	1.8408	0.1110	418.8	1.8369	0.1060	418.7	1.8332	50
55	0.1245	423.6	1.8589	0.1185	423.5	1.8548	0.1129	423.4	1.8509	0.1079	423.3	1.8472	55
60	0.1266	428.2	1.8727	0.1204	428.1	1.8687	0.1148	428.0	1.8648	0.1097	427.9	1.8611	60
65	0.1287	432.8	1.8865	0.1224	432.7	1.8824	0.1167	432.6	1.8786	0.1115	432.5	1.8749	65
70	0.1308	437.5	1.9001	0.1244	437.4	1.8961	0.1186	437.3	1.8923	0.1133	437.2	1.8886	70
75	0.1328	442.2	1.9137	0.1264	442.1	1.9097	0.1205	442.0	1.9059	0.1151	441.9	1.9022	75
80	0.1349	446.9	1.9272	0.1283	446.8	1.9232	0.1224	446.7	1.9194	0.1169	446.6	1.9157	80
85	0.1369	451.7	1.9406	0.1303	451.6	1.9366	0.1242	451.5	1.9328	0.1187	451.4	1.9292	85
90	0.1389	456.5	1.9539	0.1322	456.4	1.9499	0.1261	456.3	1.9461	0.1205	456.2	1.9425	90
95	0.1410	461.3	1.9672	0.1342	461.2	1.9632	0.1279	461.1	1.9594	0.1223	461.1	1.9558	95
100	0.1430	466.2	1.9803	0.1361	466.1	1.9764	0.1298	466.0	1.9726	0.1241	465.9	1.9690	100
105	0.1450	471.1	1.9934	0.1380	471.0	1.9895	0.1316	471.0	1.9857	0.1258	470.9	1.9821	105
110	0.1471	476.1	2.0064	0.1400	476.0	2.0025	0.1335	475.9	1.9987	0.1276	475.8	1.9951	110
115	0.1491	481.1	2.0194	0.1419	481.0	2.0154	0.1353	480.9	2.0117	0.1294	480.8	2.0081	115
120	0.1511	486.1	2.0322	0.1438	486.0	2.0283	0.1372	485.9	2.0245	0.1311	485.9	2.0209	120
125	0.1531	491.2	2.0450	0.1457	491.1	2.0411	0.1390	491.0	2.0374	0.1329	490.9	2.0338	125
130	0.1551	496.3	2.0578	0.1477	496.2	2.0539	0.1409	496.1	2.0501	0.1346	496.0	2.0465	130
135	0.1571	501.4	2.0704	0.1496	501.3	2.0665	0.1427	501.3	2.0628	0.1364	501.2	2.0592	135

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													TEMP. °C
TEMP. °C	240			250			260			270			
	(-14.28°C)			(-13.25°C)			(-12.24°C)			(-11.26°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
(0.0776)	(362.5)	(1.6364)	(0.0746)	(363.1)	(1.6358)	(0.0719)	(363.7)	(1.6353)	(0.0693)	(364.3)	(1.6348)		
-10	0.0793	366.2	1.6503	0.0759	365.9	1.6464	0.0727	365.7	1.6426	0.0698	365.4	1.6390	-10
-5	0.0813	370.4	1.6663	0.0778	370.2	1.6625	0.0745	369.9	1.6588	0.0715	369.7	1.6552	-5
0	0.0832	374.7	1.6821	0.0796	374.4	1.6783	0.0764	374.2	1.6746	0.0733	374.0	1.6711	0
5	0.0851	378.9	1.6976	0.0815	378.7	1.6938	0.0781	378.5	1.6902	0.0750	378.3	1.6867	5
10	0.0870	383.2	1.7129	0.0833	383.0	1.7092	0.0799	382.8	1.7056	0.0767	382.7	1.7022	10
15	0.0888	387.5	1.7280	0.0851	387.4	1.7243	0.0816	387.2	1.7208	0.0784	387.0	1.7174	15
20	0.0907	391.9	1.7429	0.0869	391.7	1.7393	0.0834	391.5	1.7358	0.0801	391.4	1.7324	20
25	0.0925	396.3	1.7577	0.0886	396.1	1.7541	0.0851	395.9	1.7507	0.0817	395.8	1.7473	25
30	0.0943	400.7	1.7723	0.0904	400.5	1.7688	0.0868	400.4	1.7654	0.0834	400.2	1.7620	30
35	0.0961	405.1	1.7868	0.0921	404.9	1.7833	0.0884	404.8	1.7799	0.0850	404.7	1.7766	35
40	0.0979	409.6	1.8012	0.0939	409.4	1.7977	0.0901	409.3	1.7943	0.0866	409.1	1.7911	40
45	0.0997	414.1	1.8154	0.0956	413.9	1.8120	0.0917	413.8	1.8086	0.0882	413.7	1.8054	45
50	0.1015	418.6	1.8296	0.0973	418.5	1.8261	0.0934	418.3	1.8228	0.0898	418.2	1.8195	50
55	0.1032	423.2	1.8436	0.0990	423.0	1.8402	0.0950	422.9	1.8368	0.0914	422.8	1.8366	55
60	0.1050	427.8	1.8575	0.1007	427.6	1.8541	0.0967	427.5	1.8508	0.0930	427.4	1.8476	60
65	0.1067	432.4	1.8713	0.1023	432.3	1.8679	0.0983	432.2	1.8646	0.0945	432.1	1.8614	65
70	0.1085	437.1	1.8850	0.1040	437.0	1.8816	0.0999	436.8	1.8784	0.0961	436.7	1.8752	70
75	0.1102	441.8	1.8987	0.1057	441.7	1.8953	0.1015	441.6	1.8920	0.0976	441.5	1.8889	75
80	0.1119	446.5	1.9122	0.1073	446.4	1.9088	0.1031	446.3	1.9056	0.0992	446.2	1.9024	80
85	0.1137	451.3	1.9256	0.1090	451.2	1.9223	0.1047	451.1	1.9190	0.1007	451.0	1.9159	85
90	0.1154	456.1	1.9390	0.1107	456.0	1.9356	0.1063	455.9	1.9324	0.1023	455.8	1.9293	90
95	0.1171	461.0	1.9523	0.1123	460.9	1.9489	0.1079	460.8	1.9457	0.1038	460.7	1.9426	95
100	0.1188	465.9	1.9655	0.1139	465.8	1.9621	0.1095	465.7	1.9589	0.1053	465.6	1.9558	100
105	0.1205	470.8	1.9786	0.1156	470.7	1.9753	0.1110	470.6	1.9720	0.1069	470.5	1.9689	105
110	0.1222	475.8	1.9916	0.1172	475.7	1.9883	0.1126	475.6	1.9851	0.1084	475.5	1.9820	110
115	0.1239	480.8	2.0046	0.1188	480.7	2.0013	0.1142	480.6	1.9981	0.1099	480.5	1.9950	115
120	0.1256	485.8	2.0175	0.1205	485.7	2.0142	0.1158	485.6	2.0110	0.1114	485.6	2.0079	120
125	0.1273	490.9	2.0303	0.1221	490.8	2.0270	0.1173	490.7	2.0238	0.1129	490.6	2.0207	125
130	0.1290	496.0	2.0431	0.1237	495.9	2.0398	0.1189	495.8	2.0366	0.1144	495.8	2.0335	130
135	0.1306	501.1	2.0558	0.1253	501.1	2.0525	0.1205	501.0	2.0493	0.1159	500.9	2.0462	135
140	0.1323	506.3	2.0684	0.1270	506.2	2.0651	0.1220	506.2	2.0619	0.1174	506.1	2.0589	140

ABSOLUTE PRESSURE, kPa													TEMP. °C
TEMP. °C	280			290			300			310			
	(-10.31°C)			(-9.39°C)			(-8.49°C)			(-7.61°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
(0.0669)	(364.9)	(1.6343)	(0.0647)	(365.4)	(1.6339)	(0.0626)	(365.9)	(1.6335)	(0.0606)	(366.4)	(1.6331)		
-10	0.0670	365.1	1.6354	—	—	—	—	—	—	—	—	—	-10
-5	0.0688	369.5	1.6517	0.0662	369.2	1.6483	0.0638	369.0	1.6449	0.0615	368.7	1.6417	-5
0	0.0705	373.8	1.6676	0.0678	373.6	1.6643	0.0654	373.3	1.6610	0.0631	373.1	1.6579	0
5	0.0722	378.1	1.6834	0.0695	377.9	1.6801	0.0670	377.7	1.6769	0.0646	377.5	1.6737	5
10	0.0738	382.5	1.6988	0.0711	382.3	1.6956	0.0685	382.1	1.6924	0.0662	381.9	1.6894	10
15	0.0755	386.8	1.7141	0.0727	386.6	1.7109	0.0701	386.5	1.7078	0.0677	386.3	1.7048	15
20	0.0771	391.2	1.7292	0.0742	391.0	1.7260	0.0716	390.9	1.7229	0.0692	390.7	1.7199	20
25	0.0787	395.6	1.7441	0.0758	395.5	1.7410	0.0731	395.3	1.7379	0.0706	395.1	1.7349	25
30	0.0803	400.0	1.7588	0.0773	399.9	1.7557	0.0746	399.7	1.7527	0.0721	399.6	1.7498	30
35	0.0818	404.5	1.7734	0.0789	404.4	1.7703	0.0761	404.2	1.7674	0.0735	404.1	1.7644	35
40	0.0834	409.0	1.7879	0.0804	408.9	1.7848	0.0776	408.7	1.7819	0.0749	408.6	1.7790	40
45	0.0849	413.5	1.8022	0.0819	413.4	1.7992	0.0790	413.3	1.7962	0.0764	413.1	1.7934	45
50	0.0865	418.1	1.8164	0.0834	418.0	1.8134	0.0805	417.8	1.8105	0.0778	417.7	1.8076	50
55	0.0880	422.7	1.8305	0.0849	422.5	1.8275	0.0819	422.4	1.8246	0.0792	422.3	1.8218	55
60	0.0895	427.3	1.8445	0.0863	427.2	1.8415	0.0833	427.1	1.8386	0.0805	426.9	1.8358	60
65	0.0910	431.9	1.8584	0.0878	431.8	1.8554	0.0848	431.7	1.8525	0.0819	431.6	1.8497	65
70	0.0925	436.6	1.8721	0.0893	436.5	1.8692	0.0862	436.4	1.8663	0.0833	436.3	1.8635	70
75	0.0940	441.4	1.8858	0.0907	441.3	1.8829	0.0876	441.2	1.8800	0.0847	441.1	1.8772	75
80	0.0955	446.1	1.8994	0.0922	446.0	1.8964	0.0890	445.9	1.8936	0.0860	445.8	1.8908	80
85	0.0970	450.9	1.9129	0.0936	450.8	1.9099	0.0904	450.7	1.9071	0.0874	450.6	1.9044	85
90	0.0985	455.7	1.9263	0.0950	455.7	1.9233	0.0918	455.6	1.9205	0.0887	455.5	1.9178	90
95	0.1000	460.6	1.9396	0.0965	460.5	1.9367	0.0932	460.4	1.9338	0.0901	460.3	1.9311	95
100	0.1015	465.5	1.9528	0.0979	465.4	1.9499	0.0946	465.3	1.9471	0.0914	465.3	1.9444	100
105	0.1030	470.5	1.9660	0.0993	470.4	1.9631	0.0959	470.3	1.9603	0.0928	470.2	1.9575	105
110	0.1044	475.4	1.9790	0.1007	475.4	1.9761	0.0973	475.3	1.9733	0.0941	475.2	1.9706	110
115	0.1059	480.4	1.9920	0.1022	480.4	1.9891	0.0987	480.3	1.9864	0.0954	480.2	1.9837	115
120	0.1073	485.5	2.0049	0.1036	485.4	2.0021	0.1001	485.3	1.9993	0.0968	485.3	1.9966	120
125	0.1088	490.6	2.0178	0.1050	490.5	2.0149	0.1014	490.4	2.0121	0.0981	490.4	2.0095	125
130	0.1103	495.7	2.0306	0.1064	495.6	2.0277	0.1028	495.6	2.0249	0.0994	495.5	2.0223	130
135	0.1117	500.8	2.0433	0.1078	500.8	2.0404	0.1041	500.7	2.0377	0.1007	500.6	2.0350	135
140	0.1132	506.0	2.0559	0.1092	506.0	2.0531	0.1055	505.9	2.0503	0.1020	505.8	2.0476	140

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													
TEMP. °C	320			330			340			350			TEMP. °C
	(-6.75°C)			(-5.92°C)			(-5.10°C)			(-4.30°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.0588)	(366.9)	(1.6327)	(0.0571)	(367.4)	(1.6324)	(0.0555)	(367.9)	(1.632)	(0.0539)	(368.4)	(1.6317)	
-5	0.0594	368.5	1.6385	0.0574	368.2	1.6354	0.0555	368.0	1.6324	-	-	-	-5
0	0.0609	372.9	1.6548	0.0589	372.7	1.6517	0.0570	372.4	1.6488	0.0552	372.2	1.6459	0
5	0.0624	377.3	1.6707	0.0604	377.1	1.6677	0.0584	376.9	1.6468	0.0566	376.6	1.6620	5
10	0.0639	381.7	1.6864	0.0618	381.5	1.6834	0.0598	381.3	1.6806	0.0580	381.1	1.6778	10
15	0.0654	386.1	1.7018	0.0633	385.9	1.6989	0.0612	385.7	1.6961	0.0593	385.5	1.6934	15
20	0.0668	390.5	1.7170	0.0647	390.3	1.7142	0.0626	390.2	1.7114	0.0607	390.0	1.7087	20
25	0.0683	395.0	1.7321	0.0661	394.8	1.7293	0.0640	394.6	1.7265	0.0620	394.5	1.7238	25
30	0.0697	399.4	1.7469	0.0674	399.3	1.7441	0.0653	399.1	1.7414	0.0633	399.0	1.7388	30
35	0.0711	403.9	1.7616	0.0688	403.8	1.7589	0.0667	403.6	1.7562	0.0646	403.5	1.7536	35
40	0.0725	408.4	1.7762	0.0702	408.3	1.7734	0.0680	408.2	1.7708	0.0659	408.0	1.7682	40
45	0.0739	413.0	1.7906	0.0715	412.9	1.7879	0.0693	412.7	1.7852	0.0672	412.6	1.7827	45
50	0.0752	417.6	1.8049	0.0728	417.4	1.8022	0.0706	417.3	1.7996	0.0685	417.2	1.7970	50
55	0.0766	422.2	1.8190	0.0742	422.1	1.8164	0.0719	421.9	1.8138	0.0697	421.8	1.8112	55
60	0.0779	426.8	1.8331	0.0755	426.7	1.8304	0.0732	426.6	1.8278	0.0710	426.5	1.8253	60
65	0.0793	431.5	1.8470	0.0768	431.4	1.8444	0.0744	431.3	1.8418	0.0722	431.2	1.8393	65
70	0.0806	436.2	1.8608	0.0781	436.1	1.8582	0.0757	436.0	1.8556	0.0734	435.9	1.8531	70
75	0.0819	440.9	1.8745	0.0794	440.8	1.8719	0.0769	440.7	1.8694	0.0747	440.6	1.8669	75
80	0.0833	445.7	1.8882	0.0807	445.6	1.8856	0.0782	445.5	1.8830	0.0759	445.4	1.8806	80
85	0.0846	450.5	1.9017	0.0819	450.4	1.8991	0.0794	450.3	1.8966	0.0771	450.2	1.8941	85
90	0.0859	455.4	1.9151	0.0832	455.3	1.9125	0.0807	455.2	1.9100	0.0783	455.1	1.9076	90
95	0.0872	460.3	1.9285	0.0845	460.2	1.9259	0.0819	460.1	1.9234	0.0795	460.0	1.9210	95
100	0.0885	465.2	1.9417	0.0857	465.1	1.9392	0.0832	465.0	1.9367	0.0807	464.9	1.9342	100
105	0.0898	470.1	1.9549	0.0870	470.0	1.9524	0.0844	470.0	1.9499	0.0819	469.9	1.9475	105
110	0.0911	475.1	1.9680	0.0883	475.0	1.9655	0.0856	475.0	1.9630	0.0831	474.9	1.9606	110
115	0.0924	480.1	1.9810	0.0895	480.1	1.9785	0.0868	480.0	1.9760	0.0843	479.9	1.9736	115
120	0.0937	485.2	1.9940	0.0908	485.1	1.9914	0.0880	485.0	1.9890	0.0855	485.0	1.9866	120
125	0.0950	490.3	2.0069	0.0920	490.2	2.0043	0.0893	490.1	2.0019	0.0866	490.1	1.9995	125
130	0.0962	495.4	2.0197	0.0933	495.3	2.0171	0.0905	495.3	2.0147	0.0878	495.2	2.0123	130
135	0.0975	500.6	2.0324	0.0945	500.5	2.0299	0.0917	500.4	2.0274	0.0890	500.4	2.0250	135
140	0.0988	505.8	2.0450	0.0957	505.7	2.0425	0.0929	505.6	2.0401	0.0902	505.6	2.0377	140
145	0.1001	511.0	2.0576	0.0970	510.9	2.0551	0.0941	510.9	2.0527	0.0913	510.8	2.0503	145

ABSOLUTE PRESSURE, kPa													
TEMP. °C	360			370			380			390			TEMP. °C
	(-3.52°C)			(1.63°C)			(-2.01°C)			(-1.27°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.0525)	(368.8)	(1.6314)	(0.0517)	(369.2)	(1.6311)	(0.0498)	(369.7)	(1.6308)	(0.0485)	(370.1)	(1.6305)	
0	0.0535	372.0	1.6430	0.0518	371.7	1.6402	0.0503	371.5	1.6375	0.0489	371.2	1.6348	0
5	0.0549	376.4	1.6592	0.0532	376.2	1.6565	0.0517	376.0	1.6538	0.0502	375.8	1.6512	5
10	0.0562	380.9	1.6751	0.0546	380.7	1.6724	0.0530	380.5	1.6698	0.0515	380.3	1.6672	10
15	0.0576	385.3	1.6907	0.0559	385.1	1.6880	0.0543	385.0	1.6855	0.0527	384.8	1.6829	15
20	0.0589	389.8	1.7061	0.0572	389.6	1.7035	0.0555	389.4	1.7009	0.0540	389.3	1.6984	20
25	0.0602	394.3	1.7212	0.0584	394.1	1.7187	0.0568	394.0	1.7162	0.0552	393.8	1.7137	25
30	0.0615	398.8	1.7362	0.0597	398.6	1.7337	0.0580	398.5	1.7312	0.0564	398.3	1.7288	30
35	0.0627	403.3	1.7510	0.0609	403.2	1.7485	0.0592	403.0	1.7461	0.0576	402.9	1.7437	35
40	0.0640	407.9	1.7657	0.0621	407.7	1.7632	0.0604	407.6	1.7608	0.0588	407.4	1.7584	40
45	0.0652	412.4	1.7802	0.0634	412.3	1.7777	0.0616	412.2	1.7753	0.0599	412.0	1.7730	45
50	0.0665	417.1	1.7945	0.0646	416.9	1.7921	0.0628	416.8	1.7897	0.0611	416.7	1.7874	50
55	0.0677	421.7	1.8088	0.0658	421.6	1.8063	0.0639	421.4	1.8040	0.0622	421.3	1.8017	55
60	0.0689	426.3	1.8229	0.0670	426.2	1.8205	0.0651	426.1	1.8181	0.0634	426.0	1.8158	60
65	0.0701	431.0	1.8368	0.0681	430.9	1.8345	0.0663	430.8	1.8321	0.0645	430.7	1.8299	65
70	0.0713	435.8	1.8507	0.0693	435.7	1.8484	0.0674	435.6	1.8460	0.0656	435.4	1.8438	70
75	0.0725	440.5	1.8645	0.0705	440.4	1.8621	0.0685	440.3	1.8598	0.0667	440.2	1.8576	75
80	0.0737	445.3	1.8782	0.0716	445.2	1.8758	0.0697	445.1	1.8735	0.0678	445.0	1.8713	80
85	0.0749	450.1	1.8917	0.0728	450.1	1.8894	0.0708	450.0	1.8871	0.0689	449.9	1.8849	85
90	0.0761	455.0	1.9052	0.0739	454.9	1.9029	0.0719	454.8	1.9006	0.0700	454.7	1.8984	90
95	0.0772	459.9	1.9186	0.0751	459.8	1.9163	0.0730	459.7	1.9140	0.0711	459.6	1.9118	95
100	0.0784	464.8	1.9319	0.0762	464.7	1.9296	0.0741	464.7	1.9273	0.0722	464.6	1.9251	100
105	0.0796	469.8	1.9451	0.0774	469.7	1.9428	0.0753	469.6	1.9406	0.0733	469.5	1.9384	105
110	0.0807	474.8	1.9582	0.0785	474.7	1.9559	0.0764	474.6	1.9537	0.0743	474.5	1.9515	110
115	0.0819	479.8	1.9713	0.0796	479.7	1.9690	0.0775	479.7	1.9668	0.0754	479.6	1.9646	115
120	0.0830	484.9	1.9842	0.0807	484.8	1.9820	0.0786	484.7	1.9798	0.0765	484.7	1.9776	120
125	0.0842	490.0	1.9971	0.0819	489.9	1.9949	0.0796	489.8	1.9927	0.0776	489.8	1.9905	125
130	0.0853	495.1	2.0100	0.0830	495.1	2.0077	0.0807	495.0	2.0055	0.0786	494.9	2.0033	130
135	0.0865	500.3	2.0227	0.0841	500.2	2.0205	0.0818	500.2	2.0183	0.0797	500.1	2.0161	135
140	0.0876	505.5	2.0354	0.0852	505.4	2.0331	0.0829	505.4	2.0309	0.0807	505.3	2.0288	140
145	0.0888	510.8	2.0480	0.0863	510.7	2.0458	0.0840	510.6	2.0436	0.0818	510.6	2.0414	145
150	0.0899	516.0	2.0605	0.0874	516.0	2.0583	0.0851	515.9	2.0561	0.0829	515.8	2.0540	150

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													TEMP. °C
TEMP. °C	400			425			450			475			
	(-0.55°C)			(1.19°C)			(2.86°C)			(4.46°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
(0.0470)	(370.5)	(1.6303)	(0.0446)	(371.5)	(1.6297)	(0.0422)	(372.4)	(1.6291)	(0.0400)	(373.3)	(1.6286)		
0	0.0475	371.0	1.6321	—	—	—	—	—	—	—	—	—	0
5	0.0488	375.5	1.6486	0.0456	375.0	1.6423	0.0427	374.4	1.6363	0.0401	373.8	1.6304	5
10	0.0500	380.1	1.6647	0.0468	379.5	1.6585	0.0438	379.0	1.6527	0.0412	378.5	1.6470	10
15	0.0513	384.6	1.6805	0.0480	384.1	1.6745	0.0450	383.6	1.6667	0.0423	383.1	1.6632	15
20	0.0525	389.1	1.6960	0.0491	388.6	1.6901	0.0461	388.2	1.6845	0.0434	387.7	1.6791	20
25	0.0537	393.6	1.7113	0.0503	393.2	1.7055	0.0472	392.7	1.7000	0.0445	392.3	1.6947	25
30	0.0549	398.2	1.7264	0.0514	397.7	1.7207	0.0483	397.3	1.7152	0.0455	396.9	1.7100	30
35	0.0560	402.7	1.7413	0.0525	402.3	1.7357	0.0493	401.9	1.7303	0.0465	401.5	1.7252	35
40	0.0572	407.3	1.7561	0.0536	406.9	1.7505	0.0504	406.6	1.7452	0.0475	406.2	1.7401	40
45	0.0583	411.9	1.7707	0.0547	411.6	1.7652	0.0514	411.2	1.7599	0.0485	410.9	1.7549	45
50	0.0595	416.5	1.7851	0.0557	416.2	1.7797	0.0524	415.9	1.7744	0.0495	415.5	1.7695	50
55	0.0606	421.2	1.7994	0.0568	420.9	1.7940	0.0535	420.6	1.7888	0.0505	420.2	1.7839	55
60	0.0617	425.9	1.8136	0.0579	425.6	1.8082	0.0545	425.3	1.8031	0.0514	425.0	1.7982	60
65	0.0628	430.6	1.8277	0.0589	430.3	1.8223	0.0555	430.0	1.8172	0.0524	429.7	1.8124	65
70	0.0639	435.3	1.8416	0.0599	435.1	1.8363	0.0564	434.8	1.8312	0.0533	434.5	1.8264	70
75	0.0650	440.1	1.8554	0.0610	439.8	1.8501	0.0574	439.6	1.8451	0.0542	439.3	1.8403	75
80	0.0660	444.9	1.8691	0.0620	444.7	1.8639	0.0584	444.4	1.8589	0.0552	444.2	1.8542	80
85	0.0671	449.8	1.8827	0.0630	449.5	1.8775	0.0594	449.3	1.8726	0.0561	449.0	1.8678	85
90	0.0682	454.6	1.8962	0.0640	454.4	1.8911	0.0603	454.2	1.8861	0.0570	453.9	1.8814	90
95	0.0693	459.5	1.9097	0.0650	459.3	1.9045	0.0613	459.1	1.8996	0.0579	458.9	1.8949	95
100	0.0703	464.5	1.9230	0.0660	464.3	1.9179	0.0622	464.0	1.9130	0.0588	463.8	1.9083	100
105	0.0714	469.5	1.9362	0.0670	469.3	1.9311	0.0632	469.0	1.9263	0.0597	468.8	1.9216	105
110	0.0724	474.5	1.9494	0.0680	474.3	1.9443	0.0641	474.1	1.9395	0.0606	473.9	1.9349	110
115	0.0735	479.5	1.9625	0.0690	479.3	1.9574	0.0651	479.1	1.9526	0.0615	478.9	1.9480	115
120	0.0745	484.6	1.9755	0.0700	484.4	1.9704	0.0660	484.2	1.9656	0.0624	484.0	1.9610	120
125	0.0756	489.7	1.9884	0.0710	489.5	1.9833	0.0670	489.3	1.9785	0.0633	489.1	1.9740	125
130	0.0766	494.8	2.0012	0.0720	494.7	1.9962	0.0679	494.5	1.9914	0.0642	494.3	1.9869	130
135	0.0776	500.0	2.0140	0.0730	499.9	2.0090	0.0688	499.7	2.0042	0.0651	499.5	1.9997	135
140	0.0787	505.2	2.0267	0.0739	505.1	2.0217	0.0697	504.9	2.0169	0.0660	504.7	2.0124	140
145	0.0797	510.5	2.0393	0.0749	510.3	2.0343	0.0707	510.2	2.0296	0.0669	510.0	2.0251	145
150	0.0807	515.8	2.0519	0.0759	515.6	2.0469	0.0716	515.5	2.0422	0.0677	515.3	2.0377	150

ABSOLUTE PRESSURE, kPa													TEMP. °C
TEMP. °C	500			525			550			575			
	(5.99°C)			(7.47°C)			(8.90°C)			(10.28°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
(0.0380)	(374.1)	(1.6281)	(0.0362)	(374.9)	(1.6277)	(0.0346)	(375.7)	(1.6272)	(0.0331)	(376.4)	(1.6268)		
10	0.0389	377.9	1.6415	0.0367	377.3	1.6362	0.0348	376.8	1.6310	—	—	—	10
15	0.0399	382.6	1.6578	0.0378	382.0	1.6527	0.0358	381.5	1.6476	0.0340	381.0	1.6427	15
20	0.0410	387.2	1.6738	0.0388	386.7	1.6688	0.0368	386.2	1.6639	0.0349	385.7	1.6591	20
25	0.0420	391.9	1.6895	0.0398	391.4	1.6846	0.0377	390.9	1.6798	0.0359	390.5	1.6752	25
30	0.0430	396.5	1.7050	0.0407	396.1	1.7001	0.0387	395.6	1.6954	0.0368	395.2	1.6909	30
35	0.0440	401.2	1.7202	0.0417	400.8	1.7154	0.0396	400.3	1.7108	0.0377	399.9	1.7064	35
40	0.0449	405.8	1.7352	0.0426	405.4	1.7305	0.0405	405.1	1.7260	0.0385	404.7	1.7216	40
45	0.0459	410.5	1.7500	0.0435	410.1	1.7454	0.0414	409.8	1.7409	0.0394	409.4	1.7366	45
50	0.0468	415.2	1.7647	0.0444	414.9	1.7601	0.0422	414.5	1.7557	0.0402	414.2	1.7515	50
55	0.0478	419.9	1.7792	0.0453	419.6	1.7747	0.0431	419.3	1.7703	0.0411	418.9	1.7661	55
60	0.0487	424.7	1.7935	0.0462	424.4	1.7891	0.0439	424.0	1.7848	0.0419	423.7	1.7806	60
65	0.0496	429.4	1.8078	0.0471	429.1	1.8033	0.0448	428.8	1.7990	0.0427	428.5	1.7949	65
70	0.0505	434.2	1.8218	0.0479	433.9	1.8174	0.0456	433.7	1.8132	0.0435	433.4	1.8091	70
75	0.0514	439.0	1.8358	0.0488	438.8	1.8314	0.0464	438.5	1.8272	0.0443	438.2	1.8232	75
80	0.0523	443.9	1.8496	0.0497	443.6	1.8453	0.0473	443.4	1.8411	0.0451	443.1	1.8371	80
85	0.0532	448.8	1.8633	0.0505	448.5	1.8590	0.0481	448.3	1.8549	0.0459	448.0	1.8509	85
90	0.0540	453.7	1.8770	0.0513	453.5	1.8727	0.0489	453.2	1.8686	0.0466	453.0	1.8646	90
95	0.0549	458.6	1.8905	0.0522	458.4	1.8862	0.0497	458.2	1.8821	0.0474	457.9	1.8782	95
100	0.0558	463.6	1.9039	0.0530	463.4	1.8997	0.0505	463.2	1.8956	0.0482	462.9	1.8917	100
105	0.0566	468.6	1.9172	0.0538	468.4	1.9130	0.0513	468.2	1.9090	0.0489	468.0	1.9051	105
110	0.0575	473.7	1.9305	0.0547	473.4	1.9263	0.0521	473.2	1.9223	0.0497	473.0	1.9184	110
115	0.0584	478.7	1.9436	0.0555	478.5	1.9394	0.0529	478.3	1.9354	0.0505	478.1	1.9316	115
120	0.0592	483.8	1.9567	0.0563	483.6	1.9525	0.0536	483.4	1.9485	0.0512	483.3	1.9447	120
125	0.0601	489.0	1.9697	0.0571	488.8	1.9655	0.0544	488.6	1.9616	0.0520	488.4	1.9577	125
130	0.0609	494.1	1.9826	0.0579	494.0	1.9784	0.0552	493.8	1.9745	0.0527	493.6	1.9707	130
135	0.0617	499.3	1.9954	0.0587	499.2	1.9913	0.0560	499.0	1.9873	0.0534	498.8	1.9836	135
140	0.0626	504.6	2.0081	0.0595	504.4	2.0040	0.0567	504.2	2.0001	0.0542	504.1	1.9964	140
145	0.0634	509.8	2.0208	0.0603	509.7	2.0167	0.0575	509.5	2.0128	0.0549	509.4	2.0091	145
150	0.0643	515.1	2.0334	0.0611	515.0	2.0293	0.0583	514.8	2.0254	0.0557	514.7	2.0217	150
155	0.0651	520.5	2.0460	0.0619	520.3	2.0419	0.0590	520.2	2.0380	0.0564	520.0	2.0343	155
160	0.0659	525.8	2.0584	0.0627	525.7	2.0544	0.0598	525.6	2.0505	0.0571	525.4	2.0468	160

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													
TEMP. °C	600			625			650			675			TEMP. °C
	(10.28°C)			(12.90°C)			(14.16°C)			(15.37°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.0331)	(376.4)	(1.6268)	(0.0304)	(377.8)	(1.6261)	(0.0292)	(378.5)	(1.6258)	(0.0281)	(379.1)	(1.6255)	
15	0.0323	380.4	1.6380	0.0308	379.9	1.6333	0.0294	379.3	1.6287	—	—	—	15
20	0.0333	385.2	1.6545	0.0317	384.7	1.6500	0.0303	384.2	1.6455	0.0289	383.7	1.6412	20
25	0.0342	390.0	1.6707	0.0326	389.5	1.6663	0.0311	389.1	1.6620	0.0298	388.6	1.6578	25
30	0.0350	394.8	1.6865	0.0335	394.3	1.6822	0.0320	393.9	1.6780	0.0306	393.4	1.6739	30
35	0.0359	399.5	1.7020	0.0343	399.1	1.6978	0.0328	398.7	1.6938	0.0314	398.3	1.6898	35
40	0.0368	404.3	1.7174	0.0351	403.9	1.7132	0.0336	403.5	1.7092	0.0322	403.1	1.7053	40
45	0.0376	409.0	1.7324	0.0359	408.7	1.7284	0.0344	408.3	1.7245	0.0330	407.9	1.7206	45
50	0.0384	413.8	1.7473	0.0367	413.5	1.7434	0.0351	413.1	1.7395	0.0337	412.8	1.7357	50
55	0.0392	418.6	1.7620	0.0375	418.3	1.7581	0.0359	417.9	1.7543	0.0344	417.6	1.7506	55
60	0.0400	423.4	1.7766	0.0383	423.1	1.7727	0.0367	422.8	1.7689	0.0352	422.5	1.7653	60
65	0.0408	428.2	1.7910	0.0390	427.9	1.7871	0.0374	427.6	1.7834	0.0359	427.3	1.7798	65
70	0.0416	433.1	1.8052	0.0398	432.8	1.8014	0.0381	432.5	1.7977	0.0366	432.2	1.7941	70
75	0.0423	438.0	1.8193	0.0405	437.7	1.8155	0.0388	437.4	1.8119	0.0373	437.1	1.8084	75
80	0.0431	442.9	1.8333	0.0412	442.6	1.8295	0.0395	442.3	1.8259	0.0380	442.1	1.8224	80
85	0.0438	447.8	1.8471	0.0420	447.5	1.8434	0.0403	447.3	1.8398	0.0387	447.0	1.8364	85
90	0.0446	452.7	1.8608	0.0427	452.5	1.8572	0.0410	452.3	1.8536	0.0393	452.0	1.8502	90
95	0.0453	457.7	1.8744	0.0434	457.5	1.8708	0.0417	457.2	1.8673	0.0400	457.0	1.8639	95
100	0.0461	462.7	1.8880	0.0441	462.5	1.8843	0.0423	462.3	1.8808	0.0407	462.0	1.8775	100
105	0.0468	467.8	1.9014	0.0448	467.5	1.8978	0.0430	467.3	1.8943	0.0413	467.1	1.8909	105
110	0.0475	472.8	1.9147	0.0455	472.6	1.9111	0.0437	472.4	1.9077	0.0420	472.2	1.9043	110
115	0.0483	477.9	1.9279	0.0463	477.7	1.9244	0.0444	477.5	1.9209	0.0427	477.3	1.9176	115
120	0.0490	483.1	1.9410	0.0469	482.9	1.9375	0.0451	482.7	1.9341	0.0433	482.5	1.9308	120
125	0.0497	488.2	1.9541	0.0476	488.0	1.9506	0.0457	487.8	1.9472	0.0440	487.7	1.9439	125
130	0.0504	493.4	1.9671	0.0483	493.2	1.9635	0.0464	493.1	1.9602	0.0446	492.9	1.9569	130
135	0.0511	498.6	1.9799	0.0490	498.5	1.9764	0.0471	498.3	1.9731	0.0453	498.1	1.9698	135
140	0.0519	503.9	1.9927	0.0497	503.7	1.9893	0.0477	503.6	1.9859	0.0459	503.4	1.9827	140
145	0.0526	509.2	2.0055	0.0504	509.0	2.0020	0.0484	508.9	1.9986	0.0465	508.7	1.9954	145
150	0.0533	514.5	2.0181	0.0511	514.3	2.0147	0.0490	514.2	2.0113	0.0472	514.0	2.0081	150
155	0.0540	519.9	2.0307	0.0517	519.7	2.0272	0.0497	519.6	2.0239	0.0478	519.4	2.0207	155
160	0.0547	525.3	2.0432	0.0524	525.1	2.0398	0.0503	524.9	2.0365	0.0484	524.8	2.0333	160
165	0.0554	530.7	2.0556	0.0531	530.5	2.0522	0.0510	530.4	2.0489	0.0491	530.2	2.0457	165

ABSOLUTE PRESSURE, kPa													
TEMP. °C	700			725			750			775			TEMP. °C
	(16.56°C)			(17.71°C)			(18.84°C)			(19.93°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.0271)	(379.7)	(1.6252)	(0.0262)	(380.3)	(1.6249)	(0.0253)	(380.8)	(1.6246)	(0.0244)	(381.4)	(1.6243)	
20	0.0277	383.1	1.6369	0.0265	382.6	1.6327	0.0255	382.0	1.6286	0.0244	381.4	1.6245	20
25	0.0285	388.1	1.6536	0.0274	387.6	1.6496	0.0263	387.0	1.6456	0.0252	386.5	1.6417	25
30	0.0293	393.0	1.6699	0.0282	392.5	1.6660	0.0270	392.0	1.6622	0.0260	391.5	1.6584	30
35	0.0301	397.8	1.6859	0.0289	397.4	1.6821	0.0278	397.0	1.6783	0.0267	396.5	1.6747	35
40	0.0309	402.7	1.7015	0.0297	402.3	1.6978	0.0285	401.9	1.6942	0.0275	401.5	1.6906	40
45	0.0316	407.5	1.7169	0.0304	407.2	1.7133	0.0292	406.8	1.7097	0.0282	406.4	1.7062	45
50	0.0324	412.4	1.7320	0.0311	412.0	1.7285	0.0299	411.7	1.7250	0.0288	411.3	1.7216	50
55	0.0331	417.3	1.7470	0.0318	416.9	1.7435	0.0306	416.6	1.7400	0.0295	416.2	1.7367	55
60	0.0338	422.1	1.7617	0.0325	421.8	1.7583	0.0313	421.5	1.7549	0.0302	421.2	1.7516	60
65	0.0345	427.0	1.7763	0.0332	426.7	1.7729	0.0320	426.4	1.7695	0.0308	426.1	1.7663	65
70	0.0352	431.9	1.7907	0.0338	431.6	1.7873	0.0326	431.3	1.7840	0.0314	431.0	1.7808	70
75	0.0358	436.9	1.8049	0.0345	436.6	1.8016	0.0332	436.3	1.7984	0.0321	436.0	1.7952	75
80	0.0365	441.8	1.8190	0.0352	441.5	1.8157	0.0339	441.3	1.8125	0.0327	441.0	1.8094	80
85	0.0372	446.8	1.8330	0.0358	446.5	1.8297	0.0345	446.3	1.8266	0.0333	446.0	1.8235	85
90	0.0378	451.8	1.8468	0.0364	451.5	1.8436	0.0351	451.3	1.8405	0.0339	451.0	1.8374	90
95	0.0385	456.8	1.8606	0.0371	456.5	1.8574	0.0358	456.3	1.8542	0.0345	456.1	1.8512	95
100	0.0391	461.8	1.8742	0.0377	461.6	1.8710	0.0364	461.4	1.8679	0.0351	461.1	1.8649	100
105	0.0398	466.9	1.8877	0.0383	466.7	1.8845	0.0370	466.5	1.8815	0.0357	466.2	1.8785	105
110	0.0404	472.0	1.9011	0.0390	471.8	1.8979	0.0376	471.6	1.8949	0.0363	471.4	1.8919	110
115	0.0411	477.1	1.9144	0.0396	476.9	1.9113	0.0382	476.7	1.9082	0.0369	476.5	1.9053	115
120	0.0417	482.3	1.9276	0.0402	482.1	1.9245	0.0388	481.9	1.9215	0.0375	481.7	1.9185	120
125	0.0423	487.5	1.9407	0.0408	487.3	1.9376	0.0394	487.1	1.9346	0.0380	486.9	1.9317	125
130	0.0429	492.7	1.9537	0.0414	492.5	1.9506	0.0400	492.3	1.9477	0.0386	492.1	1.9448	130
135	0.0436	497.9	1.9667	0.0420	497.8	1.9636	0.0405	497.6	1.9606	0.0392	497.4	1.9578	135
140	0.0442	503.2	1.9795	0.0426	503.0	1.9765	0.0411	502.9	1.9735	0.0397	502.7	1.9707	140
145	0.0448	508.5	1.9923	0.0432	508.4	1.9893	0.0417	508.2	1.9863	0.0403	508.0	1.9835	145
150	0.0454	513.9	2.0050	0.0438	513.7	2.0020	0.0423	513.5	1.9991	0.0409	513.4	1.9962	150
155	0.0460	519.2	2.0176	0.0444	519.1	2.0146	0.0428	518.9	2.0117	0.0414	518.8	2.0089	155
160	0.0466	524.6	2.0302	0.0450	524.5	2.0272	0.0434	524.3	2.0243	0.0420	524.2	2.0215	160
165	0.0472	530.1	2.0426	0.0456	529.9	2.0397	0.0440	529.8	2.0368	0.0425	529.6	2.0340	165
170	0.0478	535.6	2.0551	0.0461	535.4	2.0521	0.0446	535.3	2.0492	0.0431	535.1	2.0464	170

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													
TEMP. °C	800			850			900			950			TEMP. °C
	(21.00°C)			(23.07°C)			(25.05°C)			(26.94°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.0237)	(381.9)	(1.624)	(0.0222)	(382.9)	(1.6235)	(0.0209)	(383.8)	(1.623)	(0.0198)	(384.7)	(1.6225)	
25	0.0243	386.0	1.6378	0.0225	384.9	1.6302	—	—	—	—	—	—	25
30	0.0250	391.0	1.6547	0.0232	390.0	1.6474	0.0216	389.0	1.6403	0.0202	387.9	1.6333	30
35	0.0258	396.1	1.6711	0.0239	395.1	1.6640	0.0223	394.2	1.6572	0.0209	393.2	1.6505	35
40	0.0265	401.0	1.6871	0.0246	400.2	1.6803	0.0230	399.3	1.6736	0.0215	398.4	1.6672	40
45	0.0271	406.0	1.7028	0.0253	405.2	1.6961	0.0236	404.4	1.6897	0.0222	403.5	1.6835	45
50	0.0278	410.9	1.7182	0.0259	410.2	1.7117	0.0243	409.4	1.7055	0.0228	408.6	1.6994	50
55	0.0285	415.9	1.7334	0.0266	415.2	1.7271	0.0249	414.4	1.7209	0.0234	413.7	1.7150	55
60	0.0291	420.8	1.7484	0.0272	420.2	1.7421	0.0255	419.5	1.7361	0.0239	418.8	1.7304	60
65	0.0297	425.8	1.7631	0.0278	425.1	1.7570	0.0260	424.5	1.7511	0.0245	423.8	1.7454	65
70	0.0304	430.7	1.7777	0.0284	430.1	1.7717	0.0266	429.5	1.7659	0.0250	428.9	1.7603	70
75	0.0310	435.7	1.7921	0.0290	435.1	1.7862	0.0272	434.6	1.7805	0.0256	434.0	1.7750	75
80	0.0316	440.7	1.8064	0.0295	440.2	1.8005	0.0277	439.6	1.7949	0.0261	439.1	1.7895	80
85	0.0322	445.7	1.8205	0.0301	445.2	1.8147	0.0283	444.7	1.8091	0.0266	444.1	1.8038	85
90	0.0328	450.8	1.8344	0.0307	450.3	1.8287	0.0288	449.8	1.8232	0.0272	449.3	1.8179	90
95	0.0334	455.8	1.8483	0.0312	455.3	1.8426	0.0294	454.9	1.8371	0.0277	454.4	1.8319	95
100	0.0339	460.9	1.8620	0.0318	460.4	1.8563	0.0299	460.0	1.8510	0.0282	459.5	1.8458	100
105	0.0345	466.0	1.8756	0.0323	465.6	1.8700	0.0304	465.1	1.8646	0.0287	464.7	1.8595	105
110	0.0351	471.1	1.8890	0.0329	470.7	1.8835	0.0309	470.3	1.8782	0.0292	469.9	1.8732	110
115	0.0357	476.3	1.9024	0.0334	475.9	1.8969	0.0314	475.5	1.8917	0.0297	475.1	1.8867	115
120	0.0362	481.5	1.9157	0.0340	481.1	1.9102	0.0320	480.7	1.9050	0.0302	480.3	1.9001	120
125	0.0368	486.7	1.9289	0.0345	486.3	1.9234	0.0325	485.9	1.9183	0.0306	485.6	1.9133	125
130	0.0373	492.0	1.9420	0.0350	491.6	1.9366	0.0330	491.2	1.9314	0.0311	490.8	1.9265	130
135	0.0379	497.2	1.9550	0.0355	496.9	1.9496	0.0335	496.5	1.9445	0.0316	496.1	1.9396	135
140	0.0384	502.5	1.9679	0.0361	502.2	1.9625	0.0340	501.8	1.9575	0.0321	501.5	1.9526	140
145	0.0390	507.9	1.9807	0.0366	507.5	1.9754	0.0345	507.2	1.9703	0.0325	506.9	1.9655	145
150	0.0395	513.2	1.9935	0.0371	512.9	1.9882	0.0349	512.6	1.9831	0.0330	512.2	1.9784	150
155	0.0401	518.6	2.0061	0.0376	518.3	2.0009	0.0354	518.0	1.9959	0.0335	517.7	1.9911	155
160	0.0406	524.0	2.0187	0.0381	523.7	2.0135	0.0359	523.4	2.0085	0.0339	523.1	2.0038	160
165	0.0411	529.5	2.0312	0.0386	529.2	2.0260	0.0364	528.9	2.0211	0.0344	528.6	2.0163	165
170	0.0417	535.0	2.0437	0.0391	534.7	2.0385	0.0369	534.4	2.0335	0.0349	534.1	2.0288	170
175	0.0422	540.5	2.0561	0.0397	540.2	2.0509	0.0374	539.9	2.0460	0.0353	539.7	2.0413	175

ABSOLUTE PRESSURE, kPa													
TEMP. °C	1000			1100			1200			1300			TEMP. °C
	(28.77°C)			(32.22°C)			(35.44°C)			(38.47°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
	(0.0187)	(385.5)	(1.6220)	(0.0169)	(387.0)	(1.6210)	(0.0154)	(388.3)	(1.6199)	(0.0141)	(389.4)	(1.6189)	
30	0.0189	386.8	1.6264	—	—	—	—	—	—	—	—	—	30
35	0.0196	392.2	1.6439	0.0173	390.0	1.6311	—	—	—	—	—	—	35
40	0.0202	397.5	1.6609	0.0179	395.5	1.6486	0.0160	393.4	1.6366	0.0143	391.2	1.6247	40
45	0.0208	402.7	1.6774	0.0185	400.9	1.6656	0.0165	399.0	1.6542	0.0149	397.0	1.6430	45
50	0.0214	407.8	1.6935	0.0191	406.2	1.6821	0.0171	404.4	1.6712	0.0154	402.6	1.6605	50
55	0.0220	413.0	1.7093	0.0196	411.4	1.6983	0.0176	409.8	1.6877	0.0159	408.1	1.6775	55
60	0.0225	418.1	1.7248	0.0201	416.6	1.7140	0.0181	415.1	1.7038	0.0164	413.6	1.6939	60
65	0.0231	423.2	1.7400	0.0207	421.8	1.7295	0.0186	420.4	1.7195	0.0169	419.0	1.7100	65
70	0.0236	428.3	1.7549	0.0212	427.0	1.7447	0.0191	425.7	1.7350	0.0174	424.3	1.7257	70
75	0.0241	433.4	1.7697	0.0217	432.2	1.7596	0.0196	430.9	1.7501	0.0178	429.6	1.7411	75
80	0.0247	438.5	1.7843	0.0221	437.3	1.7744	0.0200	436.2	1.7651	0.0182	434.9	1.7562	80
85	0.0252	443.6	1.7986	0.0226	442.5	1.7889	0.0205	441.4	1.7798	0.0187	440.2	1.7711	85
90	0.0257	448.7	1.8129	0.0231	447.7	1.8033	0.0209	446.6	1.7943	0.0191	445.5	1.7858	90
95	0.0262	453.9	1.8269	0.0235	452.9	1.8175	0.0213	451.9	1.8086	0.0195	450.8	1.8003	95
100	0.0266	459.0	1.8409	0.0240	458.1	1.8315	0.0218	457.1	1.8228	0.0199	456.1	1.8146	100
105	0.0271	464.2	1.8547	0.0244	463.3	1.8454	0.0222	462.4	1.8368	0.0203	461.4	1.8287	105
110	0.0276	469.4	1.8683	0.0249	468.5	1.8592	0.0226	467.7	1.8507	0.0207	466.7	1.8427	110
115	0.0281	474.6	1.8819	0.0253	473.8	1.8728	0.0230	472.9	1.8644	0.0211	472.1	1.8565	115
120	0.0285	479.9	1.8953	0.0258	479.1	1.8863	0.0234	478.3	1.8780	0.0215	477.4	1.8702	120
125	0.0290	485.2	1.9086	0.0262	484.4	1.8997	0.0238	483.6	1.8915	0.0218	482.8	1.8837	125
130	0.0295	490.5	1.9219	0.0266	489.7	1.9130	0.0242	488.9	1.9048	0.0222	488.2	1.8972	130
135	0.0299	495.8	1.9350	0.0270	495.1	1.9262	0.0246	494.3	1.9181	0.0226	493.6	1.9105	135
140	0.0304	501.1	1.9480	0.0275	500.4	1.9393	0.0250	499.7	1.9312	0.0229	499.0	1.9237	140
145	0.0308	506.5	1.9609	0.0279	505.8	1.9523	0.0254	505.1	1.9443	0.0233	504.5	1.9368	145
150	0.0313	511.9	1.9738	0.0283	511.3	1.9652	0.0258	510.6	1.9572	0.0237	509.9	1.9498	150
155	0.0317	517.4	1.9866	0.0287	516.7	1.9780	0.0262	516.1	1.9701	0.0240	515.4	1.9627	155
160	0.0322	522.8	1.9992	0.0291	522.2	1.9907	0.0265	521.6	1.9829	0.0244	520.9	1.9756	160
165	0.0326	528.3	2.0118	0.0295	527.7	2.0034	0.0269	527.1	1.9956	0.0247	526.5	1.9883	165
170	0.0331	533.8	2.0244	0.0299	533.2	2.0160	0.0273	532.7	2.0082	0.0251	532.1	2.0009	170
175	0.0335	539.4	2.0368	0.0303	538.8	2.0284	0.0277	538.2	2.0207	0.0254	537.7	2.0135	175
180	0.0339	544.9	2.0492	0.0307	544.4	2.0409	0.0280	543.8	2.0332	0.0258	543.3	2.0260	180

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa

TEMP. °C	ABSOLUTE PRESSURE, kPa												TEMP. °C
	1400			1500			1600			1700			
	(41.32°C)			(44.03°C)			(46.60°C)			(49.06°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
(0.0130)	(390.4)	(1.6178)	(0.0120)	(391.3)	(1.6167)	(0.0111)	(392.1)	(1.6155)	(0.0104)	(392.7)	(1.6142)		
45	0.0134	394.8	1.6318	0.0121	392.5	1.6205	—	—	—	—	—	—	45
50	0.0139	400.7	1.6500	0.0127	398.6	1.6395	0.0115	396.4	1.6289	0.0105	394.0	1.6181	50
55	0.0145	406.4	1.6675	0.0132	404.5	1.6576	0.0120	402.5	1.6478	0.0110	400.4	1.6379	55
60	0.0149	412.0	1.6844	0.0136	410.3	1.6750	0.0125	408.5	1.6657	0.0115	406.6	1.6565	60
65	0.0154	417.5	1.7008	0.0141	415.9	1.6918	0.0130	414.3	1.6830	0.0119	412.6	1.6743	65
70	0.0158	422.9	1.7168	0.0145	421.5	1.7081	0.0134	420.0	1.6997	0.0124	418.4	1.6914	70
75	0.0163	428.3	1.7324	0.0150	427.0	1.7241	0.0138	425.6	1.7159	0.0128	424.1	1.7079	75
80	0.0167	433.7	1.7478	0.0154	432.4	1.7396	0.0142	431.1	1.7318	0.0131	429.8	1.7241	80
85	0.0171	439.1	1.7629	0.0158	437.9	1.7549	0.0146	436.6	1.7473	0.0135	435.4	1.7398	85
90	0.0175	444.4	1.7777	0.0161	443.3	1.7700	0.0149	442.1	1.7625	0.0139	440.9	1.7552	90
95	0.0179	449.8	1.7923	0.0165	448.7	1.7847	0.0153	447.6	1.7774	0.0142	446.5	1.7704	95
100	0.0183	455.1	1.8068	0.0169	454.1	1.7993	0.0157	453.0	1.7922	0.0146	452.0	1.7853	100
105	0.0187	460.5	1.8210	0.0172	459.5	1.8137	0.0160	458.5	1.8067	0.0149	457.5	1.7999	105
110	0.0190	465.8	1.8351	0.0176	464.9	1.8279	0.0163	463.9	1.8210	0.0152	463.0	1.8144	110
115	0.0194	471.2	1.8490	0.0180	470.3	1.8419	0.0167	469.4	1.8351	0.0156	468.5	1.8286	115
120	0.0198	476.6	1.8628	0.0183	475.7	1.8558	0.0170	474.9	1.8491	0.0159	474.0	1.8427	120
125	0.0201	482.0	1.8764	0.0186	481.2	1.8695	0.0173	480.3	1.8629	0.0162	479.5	1.8566	125
130	0.0205	487.4	1.8899	0.0190	486.6	1.8831	0.0177	485.8	1.8766	0.0165	485.0	1.8704	130
135	0.0208	492.8	1.9033	0.0193	492.1	1.8966	0.0180	491.3	1.8901	0.0168	490.5	1.8840	135
140	0.0212	498.3	1.9166	0.0196	497.5	1.9099	0.0183	496.8	1.9035	0.0171	496.1	1.8975	140
145	0.0215	503.8	1.9298	0.0200	503.0	1.9232	0.0186	502.3	1.9168	0.0174	501.6	1.9108	145
150	0.0218	509.2	1.9429	0.0203	508.6	1.9363	0.0189	507.9	1.9300	0.0177	507.2	1.9241	150
155	0.0222	514.8	1.9558	0.0206	514.1	1.9493	0.0192	513.4	1.9431	0.0180	512.8	1.9372	155
160	0.0225	520.3	1.9687	0.0209	519.7	1.9622	0.0195	519.0	1.9561	0.0183	518.4	1.9502	160
165	0.0229	525.9	1.9815	0.0212	525.3	1.9750	0.0198	524.6	1.9690	0.0185	524.0	1.9632	165
170	0.0232	531.5	1.9942	0.0215	530.9	1.9878	0.0201	530.3	1.9817	0.0188	529.7	1.9760	170
175	0.0235	537.1	2.0068	0.0218	536.5	2.0004	0.0204	535.9	1.9944	0.0191	535.3	1.9887	175
180	0.0238	542.7	2.0193	0.0222	542.2	2.0130	0.0207	541.6	2.0070	0.0194	541.0	2.0014	180
185	0.0242	548.4	2.0317	0.0225	547.9	2.0255	0.0210	547.3	2.0195	0.0197	546.8	2.0139	185
190	0.0245	554.1	2.0441	0.0228	553.6	2.0379	0.0213	553.0	2.0320	0.0199	552.5	2.0264	190
195	0.0248	559.8	2.0564	0.0231	559.3	2.0502	0.0215	558.8	2.0443	0.0202	558.3	2.0388	195

ABSOLUTE PRESSURE, kPa

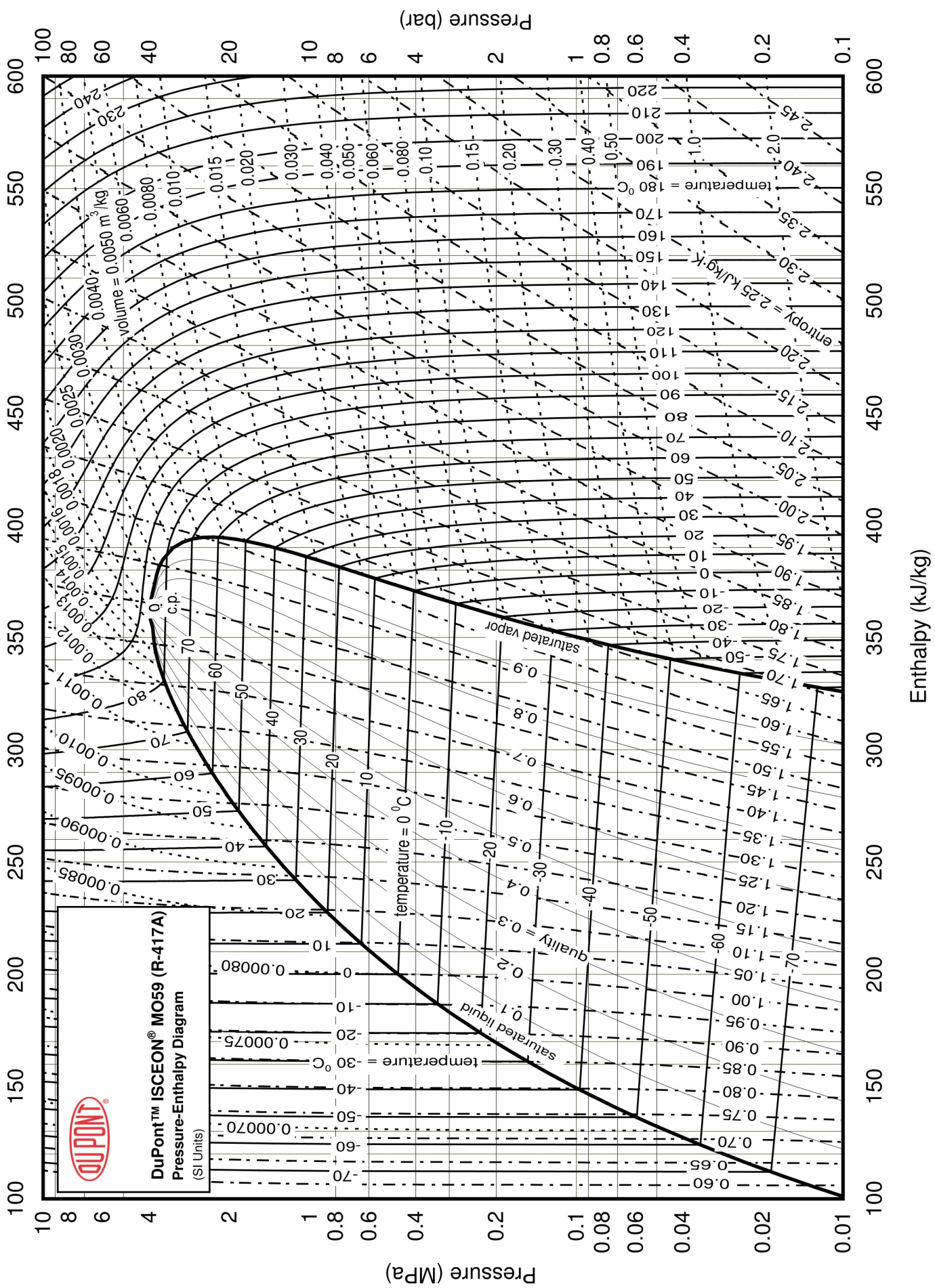
TEMP. °C	ABSOLUTE PRESSURE, kPa												TEMP. °C
	1800			1900			2000			2200			
	(51.40°C)			(53.65°C)			(55.81°C)			(59.89°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
(0.0097)	(393.3)	(1.6128)	(0.0091)	(393.8)	(1.6114)	(0.0085)	(394.1)	(1.6098)	(0.0075)	(394.6)	(1.6064)		
55	0.0101	398.2	1.6277	0.0092	395.7	1.6172	—	—	—	—	—	—	55
60	0.0106	404.6	1.6472	0.0097	402.5	1.6377	0.0089	400.13	1.6280	0.0075	394.8	1.6069	60
65	0.0110	410.8	1.6656	0.0102	408.9	1.6568	0.0094	406.9	1.6480	0.0080	402.4	1.6295	65
70	0.0114	416.8	1.6831	0.0106	415.0	1.6750	0.0098	413.3	1.6668	0.0085	409.3	1.6500	70
75	0.0118	422.6	1.7001	0.0110	421.1	1.6923	0.0102	419.4	1.6846	0.0089	415.9	1.6691	75
80	0.0122	428.4	1.7165	0.0114	426.9	1.7091	0.0106	425.5	1.7018	0.0093	422.3	1.6873	80
85	0.0126	434.1	1.7326	0.0117	432.7	1.7254	0.0110	431.4	1.7184	0.0096	428.5	1.7046	85
90	0.0129	439.7	1.7482	0.0121	438.5	1.7413	0.0113	437.2	1.7346	0.0100	434.5	1.7214	90
95	0.0133	445.3	1.7635	0.0124	444.1	1.7569	0.0116	442.9	1.7503	0.0103	440.5	1.7376	95
100	0.0136	450.9	1.7786	0.0127	449.8	1.7721	0.0120	448.7	1.7658	0.0106	446.3	1.7535	100
105	0.0139	456.5	1.7934	0.0131	455.4	1.7870	0.0123	454.3	1.7809	0.0109	452.2	1.7690	105
110	0.0142	462.0	1.8080	0.0134	461.0	1.8018	0.0126	460.0	1.7957	0.0112	457.9	1.7841	110
115	0.0146	467.5	1.8223	0.0137	466.6	1.8163	0.0129	465.6	1.8104	0.0115	463.7	1.7991	115
120	0.0149	473.1	1.8365	0.0140	472.2	1.8306	0.0131	471.3	1.8248	0.0117	469.4	1.8137	120
125	0.0152	478.6	1.8505	0.0143	477.8	1.8447	0.0134	476.9	1.8390	0.0120	475.1	1.8282	125
130	0.0155	484.2	1.8644	0.0145	483.4	1.8586	0.0137	482.5	1.8530	0.0123	480.8	1.8424	130
135	0.0158	489.7	1.8781	0.0148	488.9	1.8724	0.0140	488.2	1.8669	0.0125	486.5	1.8564	135
140	0.0160	495.3	1.8916	0.0151	494.6	1.8860	0.0142	493.8	1.8806	0.0128	492.2	1.8703	140
145	0.0163	500.9	1.9051	0.0154	500.2	1.8995	0.0145	499.4	1.8942	0.0130	497.9	1.8841	145
150	0.0166	506.5	1.9184	0.0156	505.8	1.9129	0.0148	505.1	1.9076	0.0133	503.6	1.8976	150
155	0.0169	512.1	1.9316	0.0159	511.4	1.9262	0.0150	510.7	1.9210	0.0135	509.4	1.9111	155
160	0.0172	517.7	1.9446	0.0162	517.1	1.9393	0.0153	516.4	1.9341	0.0137	515.1	1.9244	160
165	0.0174	523.4	1.9576	0.0164	522.8	1.9523	0.0155	522.1	1.9472	0.0140	520.8	1.9376	165
170	0.0177	529.1	1.9705	0.0167	528.5	1.9652	0.0158	527.8	1.9602	0.0142	526.6	1.9506	170
175	0.0180	534.8	1.9833	0.0169	534.2	1.9781	0.0160	533.6	1.9731	0.0144	532.4	1.9636	175
180	0.0182	540.5	1.9959	0.0172	539.9	1.9908	0.0163	539.3	1.9858	0.0147	538.2	1.9764	180
185	0.0185	546.2	2.0085	0.0174	545.7	2.0034	0.0165	545.1	1.9985	0.0149	544.0	1.9892	185
190	0.0188	552.0	2.0210	0.0177	551.4	2.0160	0.0168	550.9	2.0111	0.0151	549.8	2.0018	190
195	0.0190	557.8	2.0335	0.0179	557.2	2.0284	0.0170	556.7	2.0236	0.0153	555.7	2.0144	195

Table 2 (continued)
DuPont™ ISCEON® MO59 (R-417A) Superheated Vapour—Constant Pressure Tables

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

ABSOLUTE PRESSURE, kPa													TEMP. °C
TEMP. °C	2400			2600			2800			3000			
	(63.69°C)			(67.25°C)			(70.58°C)			(73.72°C)			
	V	H	S	V	H	S	V	H	S	V	H	S	
(0.0067)	(394.7)	(1.6024)	(0.0060)	(394.4)	(1.5978)	(0.0053)	(393.7)	(1.5924)	(0.0047)	(392.4)	(1.586)		
60	—	—	—	—	—	—	—	—	—	—	—	—	60
65	0.0068	396.9	1.6091	—	—	—	—	—	—	—	—	—	65
70	0.0073	404.9	1.6324	0.0063	399.5	1.6127	—	—	—	—	—	—	70
75	0.0078	412.1	1.6532	0.0067	407.7	1.6364	0.0058	402.4	1.6177	0.0049	395.6	1.5950	75
80	0.0081	418.9	1.6726	0.0072	415.1	1.6575	0.0063	410.7	1.6415	0.0055	405.7	1.6238	80
85	0.0085	425.4	1.6909	0.0075	422.0	1.6770	0.0067	418.3	1.6627	0.0059	414.1	1.6475	85
90	0.0088	431.7	1.7084	0.0079	428.6	1.6954	0.0070	425.3	1.6822	0.0063	421.7	1.6687	90
95	0.0092	437.8	1.7252	0.0082	435.0	1.7130	0.0073	432.1	1.7007	0.0066	428.9	1.6883	95
100	0.0095	443.9	1.7416	0.0085	441.3	1.7299	0.0076	438.6	1.7183	0.0069	435.7	1.7067	100
105	0.0097	449.9	1.7575	0.0088	447.5	1.7463	0.0079	445.0	1.7352	0.0072	442.3	1.7243	105
110	0.0100	455.8	1.7730	0.0090	453.5	1.7622	0.0082	451.2	1.7517	0.0074	448.8	1.7412	110
115	0.0103	461.6	1.7882	0.0093	459.5	1.7778	0.0084	457.4	1.7676	0.0077	455.1	1.7576	115
120	0.0106	467.5	1.8032	0.0096	465.5	1.7930	0.0087	463.5	1.7832	0.0079	461.3	1.7736	120
125	0.0108	473.3	1.8178	0.0098	471.4	1.8080	0.0089	469.5	1.7984	0.0082	467.5	1.7891	125
130	0.0111	479.1	1.8323	0.0100	477.3	1.8227	0.0092	475.5	1.8134	0.0084	473.6	1.8044	130
135	0.0113	484.9	1.8466	0.0103	483.2	1.8371	0.0094	481.4	1.8280	0.0086	479.6	1.8193	135
140	0.0115	490.6	1.8606	0.0105	489.0	1.8514	0.0096	487.4	1.8425	0.0088	485.7	1.8339	140
145	0.0118	496.4	1.8745	0.0107	494.9	1.8654	0.0098	493.3	1.8567	0.0090	491.7	1.8484	145
150	0.0120	502.2	1.8882	0.0109	500.7	1.8793	0.0100	499.2	1.8708	0.0092	497.6	1.8626	150
155	0.0122	508.0	1.9018	0.0112	506.5	1.8930	0.0102	505.1	1.8846	0.0094	503.6	1.8766	155
160	0.0125	513.7	1.9152	0.0114	512.4	1.9066	0.0104	511.0	1.8983	0.0096	509.6	1.8904	160
165	0.0127	519.5	1.9285	0.0116	518.2	1.9200	0.0106	516.9	1.9119	0.0098	515.5	1.9041	165
170	0.0129	525.3	1.9417	0.0118	524.1	1.9333	0.0108	522.8	1.9253	0.0100	521.5	1.9176	170
175	0.0131	531.2	1.9547	0.0120	529.9	1.9464	0.0110	528.7	1.9385	0.0102	527.4	1.9310	175
180	0.0133	537.0	1.9677	0.0122	535.8	1.9594	0.0112	534.6	1.9516	0.0104	533.4	1.9442	180
185	0.0135	542.8	1.9805	0.0124	541.7	1.9724	0.0114	540.5	1.9647	0.0106	539.4	1.9573	185
190	0.0137	548.7	1.9933	0.0126	547.6	1.9852	0.0116	546.5	1.9776	0.0107	545.4	1.9703	190
195	0.0140	554.6	2.0059	0.0128	553.5	1.9979	0.0118	552.4	1.9903	0.0109	551.3	1.9832	195

ABSOLUTE PRESSURE, kPa													TEMP. °C
TEMP. °C	3200			3400			3600						
	(76.69°C)			(79.47°C)			(82.09°C)						
	V	H	S	V	H	S	V	H	S				
(-0.0042)	(390.6)	(1.5781)	(0.0037)	(387.8)	(1.5680)	(0.0032)	(383.6)	(1.5540)					
75	—	—	—	—	—	—	—	—	—				75
80	0.0047	399.3	1.6029	0.0038	389.9	1.5739	—	—	—				80
85	0.0052	409.3	1.6310	0.0045	403.5	1.6120	0.0038	395.6	1.5879				85
90	0.0056	417.8	1.6545	0.0049	413.2	1.6391	0.0043	407.9	1.6219				90
95	0.0059	425.4	1.6755	0.0053	421.7	1.6621	0.0048	417.4	1.6479				95
100	0.0062	432.7	1.6950	0.0056	429.4	1.6829	0.0051	425.8	1.6705				100
105	0.0065	439.6	1.7133	0.0059	436.6	1.7023	0.0054	433.5	1.6910				105
110	0.0068	446.2	1.7309	0.0062	443.6	1.7205	0.0057	440.8	1.7101				110
115	0.0070	452.8	1.7478	0.0064	450.3	1.7380	0.0059	447.7	1.7282				115
120	0.0073	459.2	1.7641	0.0067	456.9	1.7548	0.0062	454.5	1.7456				120
125	0.0075	465.4	1.7801	0.0069	463.3	1.7711	0.0064	461.1	1.7623				125
130	0.0077	471.7	1.7956	0.0071	469.7	1.7870	0.0066	467.6	1.7785				130
135	0.0079	477.8	1.8108	0.0073	476.0	1.8024	0.0068	474.0	1.7943				135
140	0.0081	483.9	1.8257	0.0075	482.2	1.8176	0.0070	480.4	1.8097				140
145	0.0083	490.0	1.8403	0.0077	488.4	1.8324	0.0072	486.6	1.8248				145
150	0.0085	496.1	1.8547	0.0079	494.5	1.8470	0.0074	492.9	1.8396				150
155	0.0087	502.1	1.8689	0.0081	500.6	1.8614	0.0076	499.1	1.8541				155
160	0.0089	508.1	1.8829	0.0083	506.7	1.8755	0.0077	505.2	1.8684				160
165	0.0091	514.2	1.8967	0.0085	512.8	1.8895	0.0079	511.4	1.8825				165
170	0.0093	520.2	1.9103	0.0087	518.8	1.9032	0.0081	517.5	1.8964				170
175	0.0095	526.2	1.9238	0.0088	524.9	1.9168	0.0083	523.6	1.9101				175
180	0.0096	532.2	1.9371	0.0090	530.9	1.9303	0.0084	529.7	1.9237				180
185	0.0098	538.2	1.9503	0.0092	537.0	1.9436	0.0086	535.8	1.9371				185
190	0.0100	544.2	1.9634	0.0093	543.1	1.9567	0.0087	541.9	1.9504				190
195	0.0102	550.2	1.9763	0.0095	549.1	1.9698	0.0089	548.0	1.9635				195



For Further Information: (800) 235-7882

www.refrigerants.dupont.com

**DuPont Fluorochemicals
Wilmington, DE 19880-0711**

Europe

DuPont de Nemours
International S.A.
2 Chemin du Pavillon
P.O. Box 50
CH-1218 Le Grand-Saconnex
Geneva, Switzerland
41-22-717-5111

Canada

DuPont Canada, Inc.
P.O. Box 2200, Streetsville
Mississauga, Ontario
Canada
L5M 2H3
(905) 821-3300

DuPont México, S.A. de C.V.

Homero 206
Col. Chapultepec Morales
C.P. 11570 México, D.F.
52-55-57 22 11 00

América do Sul

DuPont do Brasil S.A.
Alameda Itapecuru, 506
Alphaville 06454-080 - Barueri
São Paulo – Brasil
55-11-7266-8263

DuPont Argentina S,A,

Casilla Correo 1888
Correo Central
1000 Buenos Aires, Argentina
54-1-311-8167

Asia Pacific

Philippines

DuPont Fareast Inc Philippines
19th floor Gt Tower International
6815 Ayala Avcorner Hv Costast
Makati City
Philippines
1227
63-2-8189911
63-2-8189659

Thailand

DuPont (Thailand) Co.,Ltd
6-7th Floor, M. Thai Tower, All Seasons Place,
87 Wireless Road, Lumpini, Phatumwan
Bangkok
Thailand
10330
66-2-6594000
66-2-6594001-2
Lapee Thempongattana
thempongattana.lapee@tha.dupont.com
www.dupont.co.th

Malaysia

DuPont Malaysia Sdn Bhd
6th Floor, Bangunan Samudera,
No.1 Jalan Kontraktor U1/14
Sek U1, Hicom-Glenmarie Industrial Park
Shah Alam
Selangor
40150
60-3-55693006
60-3-55693001
Nicholas Leong
Nicholas.Leong@mys.dupont.com

Singapore

DuPont Company (Singapore) Pte Ltd
1 HarbourFront Place #11-01
HarbourFront Tower One
Singapore
098633
65-65863688
65-62727494
Shawn Wang / Jenny Chua
shawn.wang@chn.dupont.com
jenny.chua@sgp.dupont.com

Indonesia

PT DuPont Indonesia
Menara Mulia 5th Floor
Jl Jend. Gatot Subroto Kav. 9-11
Jakarta
Indonesia
12930
62-21-5222555
62-21-5222565

Taiwan

DuPont Taiwan Ltd.
13Fl., No. 167, Tun Hwa N. Rd.,
Taipei
Taiwan, R. O. C.
105
886-2-27191999
886-2-25457098
Jackie Wu
jackie.wu@twn.dupont.com
www.dupont.com.tw

India

E I DuPont India Private Ltd
DLF Cyber Greens, Tower "C" 7th Floor
Sector 25A, DLF City
Phase III
Gurgaon 122002
INDIA
91-124-2540900
91-124-2540891
Mr. Upal Roy
Upal.Roy@ind.dupont.com
in.dupont.com

Korea

DuPont(Korea) Inc.
4th Floor, Asia Tower
#726, Yeoksam-dong, Kangnam-Ku
Seoul, Korea
135-719
82-2-22225207
82-2-22225483
Jae Young Park
jae-young.park@kor.dupont.com
www.dupont.co.kr

Hong Kong

DuPont China Limited
26/F., Tower 6, Gateway
Canton Road
Tsimsha tsui
HongKong
852-27345345
852-23683516
Tim Leung
Tim-S.T.Leung@hkg.DuPont.com

Australia/New Zealand

DuPont (Australia) Ltd
168 Walker street North Sydney
PO Box 930 North Sydney
Sydney
NSW
2060
61-2-99236111
61-2-99236135
John McCormack
john.mccormack@aus.dupont.com

China

DuPont China Holding Co.,Ltd.
15th Floor, Shui On Plaza,
333 Huai Hai Road (Central)
Shanghai
200021
86-21-63866366
86-21-63853542
Stacy Wang
stacy.wang@chn.dupont.com

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