



DuPont™ ISCEON® 9 Series

REFRIGERANTS

Technical Information

Thermodynamic Properties of DuPont™ ISCEON® M049 (R-413A) SI Units



The miracles of science™

Thermodynamic Properties of DuPont™ ISCEON® MO49 (R-413A) Refrigerant (R-218/R-134a/R-600a – 9/88/3% by weight)

SI Units

Tables of the thermodynamic properties of ISCEON® MO49 (R-417A) have been developed and are presented here. This information is based on values calculated using a DuPont thermodynamic property program.

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 | CF ₃ CF ₂ CF ₃ /CH ₂ FCF ₃ /(CH ₃) ₃ CH (9/88/3% by weight) |
| Molecular mass | 103.95 |
| Boiling Point At one atmosphere | -33.40°C |
| Critical Temperature | 98.48°C |
| Critical Pressure | 4174 kPa |
| Critical Density | 503.25 kg/m ³ |
| Critical Volume | 0.0020 m ³ /kg |

Table 1
DuPont™ ISCEON® MO49 (R-413A) 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 | 1.7 | 0.6 | 0.0007 | 22.2430 | 1534.2 | 0.0450 | 75.8 | 248.1 | 323.8 | 0.4378 | 1.8890 | -100 |
| -99 | 1.9 | 0.7 | 0.0007 | 20.1130 | 1531.6 | 0.0497 | 76.9 | 247.5 | 324.4 | 0.4445 | 1.8839 | -99 |
| -98 | 2.0 | 0.8 | 0.0007 | 18.2130 | 1529.0 | 0.0549 | 78.1 | 246.9 | 325.0 | 0.4512 | 1.8790 | -98 |
| -97 | 2.2 | 0.9 | 0.0007 | 16.5160 | 1526.3 | 0.0605 | 79.3 | 246.4 | 325.6 | 0.4579 | 1.8741 | -97 |
| -96 | 2.4 | 0.9 | 0.0007 | 14.9970 | 1523.7 | 0.0667 | 80.4 | 245.8 | 326.2 | 0.4645 | 1.8694 | -96 |
| -95 | 2.6 | 1.0 | 0.0007 | 13.6350 | 1521.1 | 0.0733 | 81.6 | 245.2 | 326.8 | 0.4711 | 1.8648 | -95 |
| -94 | 2.8 | 1.2 | 0.0007 | 12.4140 | 1518.4 | 0.0806 | 82.8 | 244.7 | 327.5 | 0.4777 | 1.8602 | -94 |
| -93 | 3.0 | 1.3 | 0.0007 | 11.3170 | 1515.8 | 0.0884 | 84.0 | 244.1 | 328.1 | 0.4842 | 1.8558 | -93 |
| -92 | 3.3 | 1.4 | 0.0007 | 10.3290 | 1513.2 | 0.0968 | 85.1 | 243.5 | 328.7 | 0.4907 | 1.8514 | -92 |
| -91 | 3.6 | 1.5 | 0.0007 | 9.4394 | 1510.5 | 0.1059 | 86.3 | 243.0 | 329.3 | 0.4972 | 1.8472 | -91 |
| -90 | 3.8 | 1.7 | 0.0007 | 8.6368 | 1507.9 | 0.1158 | 87.5 | 242.4 | 329.9 | 0.5037 | 1.8430 | -90 |
| -89 | 4.1 | 1.9 | 0.0007 | 7.9118 | 1505.2 | 0.1264 | 88.7 | 241.8 | 330.5 | 0.5101 | 1.8389 | -89 |
| -88 | 4.5 | 2.0 | 0.0007 | 7.2562 | 1502.6 | 0.1378 | 89.8 | 241.3 | 331.1 | 0.5165 | 1.8349 | -88 |
| -87 | 4.8 | 2.2 | 0.0007 | 6.6626 | 1499.9 | 0.1501 | 91.0 | 240.7 | 331.7 | 0.5228 | 1.8310 | -87 |
| -86 | 5.2 | 2.4 | 0.0007 | 6.1243 | 1497.3 | 0.1633 | 92.2 | 240.1 | 332.4 | 0.5291 | 1.8272 | -86 |
| -85 | 5.5 | 2.7 | 0.0007 | 5.6358 | 1494.6 | 0.1774 | 93.4 | 239.6 | 333.0 | 0.5354 | 1.8235 | -85 |
| -84 | 6.0 | 2.9 | 0.0007 | 5.1919 | 1491.9 | 0.1926 | 94.6 | 239.0 | 333.6 | 0.5417 | 1.8198 | -84 |
| -83 | 6.4 | 3.2 | 0.0007 | 4.7881 | 1489.3 | 0.2089 | 95.8 | 238.5 | 334.2 | 0.5480 | 1.8163 | -83 |
| -82 | 6.9 | 3.4 | 0.0007 | 4.4202 | 1486.6 | 0.2262 | 96.9 | 237.9 | 334.8 | 0.5542 | 1.8128 | -82 |
| -81 | 7.4 | 3.7 | 0.0007 | 4.0848 | 1483.9 | 0.2448 | 98.1 | 237.3 | 335.5 | 0.5604 | 1.8093 | -81 |
| -80 | 7.9 | 4.1 | 0.0007 | 3.7787 | 1481.3 | 0.2646 | 99.3 | 236.8 | 336.1 | 0.5665 | 1.8060 | -80 |
| -79 | 8.4 | 4.4 | 0.0007 | 3.4990 | 1478.6 | 0.2858 | 100.5 | 236.2 | 336.7 | 0.5727 | 1.8027 | -79 |
| -78 | 9.0 | 4.8 | 0.0007 | 3.2431 | 1475.9 | 0.3084 | 101.7 | 235.7 | 337.4 | 0.5788 | 1.7995 | -78 |
| -77 | 9.6 | 5.2 | 0.0007 | 3.0088 | 1473.2 | 0.3324 | 102.9 | 235.1 | 338.0 | 0.5849 | 1.7964 | -77 |
| -76 | 10.3 | 5.6 | 0.0007 | 2.7941 | 1470.5 | 0.3579 | 104.1 | 234.5 | 338.6 | 0.5909 | 1.7934 | -76 |
| -75 | 11.0 | 6.1 | 0.0007 | 2.5971 | 1467.8 | 0.3851 | 105.3 | 234.0 | 339.2 | 0.5970 | 1.7904 | -75 |
| -74 | 11.7 | 6.6 | 0.0007 | 2.4161 | 1465.1 | 0.4139 | 106.5 | 233.4 | 339.9 | 0.6030 | 1.7874 | -74 |
| -73 | 12.5 | 7.1 | 0.0007 | 2.2498 | 1462.4 | 0.4445 | 107.7 | 232.8 | 340.5 | 0.6090 | 1.7846 | -73 |
| -72 | 13.3 | 7.6 | 0.0007 | 2.0967 | 1459.7 | 0.4769 | 108.9 | 232.3 | 341.2 | 0.6150 | 1.7818 | -72 |
| -71 | 14.2 | 8.2 | 0.0007 | 1.9557 | 1457.0 | 0.5113 | 110.1 | 231.7 | 341.8 | 0.6209 | 1.7791 | -71 |
| -70 | 15.1 | 8.8 | 0.0007 | 1.8258 | 1454.3 | 0.5477 | 111.3 | 231.1 | 342.4 | 0.6269 | 1.7764 | -70 |
| -69 | 16.0 | 9.5 | 0.0007 | 1.7058 | 1451.6 | 0.5862 | 112.5 | 230.6 | 343.1 | 0.6328 | 1.7738 | -69 |
| -68 | 17.0 | 10.2 | 0.0007 | 1.5951 | 1448.9 | 0.6269 | 113.7 | 230.0 | 343.7 | 0.6386 | 1.7712 | -68 |
| -67 | 18.1 | 10.9 | 0.0007 | 1.4927 | 1446.1 | 0.6699 | 114.9 | 229.5 | 344.3 | 0.6445 | 1.7687 | -67 |
| -66 | 19.2 | 11.7 | 0.0007 | 1.3980 | 1443.4 | 0.7153 | 116.1 | 228.9 | 345.0 | 0.6503 | 1.7663 | -66 |
| -65 | 20.3 | 12.6 | 0.0007 | 1.3104 | 1440.7 | 0.7632 | 117.3 | 228.3 | 345.6 | 0.6562 | 1.7639 | -65 |
| -64 | 21.6 | 13.5 | 0.0007 | 1.2291 | 1437.9 | 0.8136 | 118.5 | 227.8 | 346.3 | 0.6620 | 1.7616 | -64 |
| -63 | 22.9 | 14.4 | 0.0007 | 1.1537 | 1435.2 | 0.8667 | 119.7 | 227.2 | 346.9 | 0.6677 | 1.7593 | -63 |
| -62 | 24.2 | 15.4 | 0.0007 | 1.0838 | 1432.4 | 0.9227 | 120.9 | 226.6 | 347.6 | 0.6735 | 1.7571 | -62 |
| -61 | 25.6 | 16.5 | 0.0007 | 1.0188 | 1429.7 | 0.9815 | 122.2 | 226.1 | 348.2 | 0.6792 | 1.7550 | -61 |
| -60 | 27.1 | 17.6 | 0.0007 | 0.9584 | 1426.9 | 1.0434 | 123.4 | 225.5 | 348.9 | 0.6849 | 1.7528 | -60 |
| -59 | 28.6 | 18.7 | 0.0007 | 0.9022 | 1424.2 | 1.1084 | 124.6 | 224.9 | 349.5 | 0.6906 | 1.7508 | -59 |
| -58 | 30.3 | 20.0 | 0.0007 | 0.8499 | 1421.4 | 1.1766 | 125.8 | 224.3 | 350.2 | 0.6963 | 1.7488 | -58 |
| -57 | 32.0 | 21.3 | 0.0007 | 0.8012 | 1418.6 | 1.2482 | 127.0 | 223.8 | 350.8 | 0.7020 | 1.7468 | -57 |
| -56 | 33.7 | 22.6 | 0.0007 | 0.7557 | 1415.8 | 1.3233 | 128.3 | 223.2 | 351.4 | 0.7076 | 1.7449 | -56 |
| -55 | 35.6 | 24.1 | 0.0007 | 0.7133 | 1413.1 | 1.4019 | 129.5 | 222.6 | 352.1 | 0.7132 | 1.7430 | -55 |
| -54 | 37.5 | 25.6 | 0.0007 | 0.6737 | 1410.3 | 1.4844 | 130.7 | 222.0 | 352.7 | 0.7188 | 1.7411 | -54 |
| -53 | 39.6 | 27.2 | 0.0007 | 0.6367 | 1407.5 | 1.5707 | 131.9 | 221.5 | 353.4 | 0.7244 | 1.7393 | -53 |
| -52 | 41.7 | 28.9 | 0.0007 | 0.6021 | 1404.7 | 1.6609 | 133.2 | 220.9 | 354.0 | 0.7300 | 1.7376 | -52 |
| -51 | 43.9 | 30.6 | 0.0007 | 0.5697 | 1401.9 | 1.7553 | 134.4 | 220.3 | 354.7 | 0.7356 | 1.7359 | -51 |
| -50 | 46.2 | 32.5 | 0.0007 | 0.5394 | 1399.0 | 1.8540 | 135.6 | 219.7 | 355.3 | 0.7411 | 1.7342 | -50 |
| -49 | 48.6 | 34.4 | 0.0007 | 0.5110 | 1396.2 | 1.9571 | 136.9 | 219.1 | 356.0 | 0.7466 | 1.7326 | -49 |
| -48 | 51.1 | 36.4 | 0.0007 | 0.4843 | 1393.4 | 2.0647 | 138.1 | 218.5 | 356.6 | 0.7521 | 1.7310 | -48 |
| -47 | 53.7 | 38.5 | 0.0007 | 0.4593 | 1390.6 | 2.1771 | 139.4 | 217.9 | 357.3 | 0.7576 | 1.7295 | -47 |
| -46 | 56.4 | 40.7 | 0.0007 | 0.4359 | 1387.7 | 2.2942 | 140.6 | 217.3 | 357.9 | 0.7631 | 1.7280 | -46 |
| -45 | 59.3 | 43.1 | 0.0007 | 0.4138 | 1384.9 | 2.4164 | 141.8 | 216.8 | 358.6 | 0.7685 | 1.7265 | -45 |
| -44 | 62.2 | 45.5 | 0.0007 | 0.3931 | 1382.0 | 2.5437 | 143.1 | 216.2 | 359.2 | 0.7739 | 1.7250 | -44 |
| -43 | 65.3 | 48.0 | 0.0007 | 0.3737 | 1379.2 | 2.6763 | 144.3 | 215.6 | 359.9 | 0.7794 | 1.7236 | -43 |
| -42 | 68.4 | 50.7 | 0.0007 | 0.3553 | 1376.3 | 2.8143 | 145.6 | 215.0 | 360.5 | 0.7848 | 1.7223 | -42 |
| -41 | 71.8 | 53.4 | 0.0007 | 0.3381 | 1373.4 | 2.9580 | 146.8 | 214.4 | 361.2 | 0.7901 | 1.7209 | -41 |

Table 1 (continued)
DuPont™ ISCEON® MO49 (R-413A) 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 | |
| -40 | 75.2 | 56.3 | 0.0007 | 0.3218 | 1370.5 | 3.1074 | 148.1 | 213.8 | 361.8 | 0.7955 | 1.7196 | -40 |
| -39 | 78.7 | 59.3 | 0.0007 | 0.3065 | 1367.6 | 3.2628 | 149.3 | 213.1 | 362.5 | 0.8009 | 1.7184 | -39 |
| -38 | 82.4 | 62.4 | 0.0007 | 0.2920 | 1364.7 | 3.4244 | 150.6 | 212.5 | 363.1 | 0.8062 | 1.7171 | -38 |
| -37 | 86.3 | 65.7 | 0.0007 | 0.2784 | 1361.8 | 3.5922 | 151.8 | 211.9 | 363.8 | 0.8115 | 1.7159 | -37 |
| -36 | 90.3 | 69.1 | 0.0007 | 0.2655 | 1358.9 | 3.7664 | 153.1 | 211.3 | 364.4 | 0.8169 | 1.7148 | -36 |
| -35 | 94.4 | 72.6 | 0.0007 | 0.2533 | 1356.0 | 3.9473 | 154.4 | 210.7 | 365.1 | 0.8222 | 1.7136 | -35 |
| -34 | 98.7 | 76.3 | 0.0007 | 0.2418 | 1353.1 | 4.1351 | 155.6 | 210.1 | 365.7 | 0.8274 | 1.7125 | -34 |
| -33 | 103.1 | 80.1 | 0.0007 | 0.2310 | 1350.1 | 4.3298 | 156.9 | 209.5 | 366.3 | 0.8327 | 1.7114 | -33 |
| -32 | 107.7 | 84.1 | 0.0007 | 0.2207 | 1347.2 | 4.5318 | 158.2 | 208.8 | 367.0 | 0.8380 | 1.7104 | -32 |
| -31 | 112.4 | 88.2 | 0.0007 | 0.2109 | 1344.2 | 4.7411 | 159.4 | 208.2 | 367.6 | 0.8432 | 1.7093 | -31 |
| -30 | 117.4 | 92.5 | 0.0007 | 0.2017 | 1341.3 | 4.9581 | 160.7 | 207.6 | 368.3 | 0.8484 | 1.7083 | -30 |
| -29 | 122.4 | 97.0 | 0.0007 | 0.1930 | 1338.3 | 5.1828 | 162.0 | 206.9 | 368.9 | 0.8537 | 1.7074 | -29 |
| -28 | 127.7 | 101.6 | 0.0007 | 0.1847 | 1335.3 | 5.4154 | 163.3 | 206.3 | 369.6 | 0.8589 | 1.7064 | -28 |
| -27 | 133.1 | 106.4 | 0.0008 | 0.1768 | 1332.3 | 5.6563 | 164.5 | 205.7 | 370.2 | 0.8641 | 1.7055 | -27 |
| -26 | 138.8 | 111.4 | 0.0008 | 0.1693 | 1329.3 | 5.9056 | 165.8 | 205.0 | 370.8 | 0.8692 | 1.7046 | -26 |
| -25 | 144.6 | 116.6 | 0.0008 | 0.1623 | 1326.3 | 6.1634 | 167.1 | 204.4 | 371.5 | 0.8744 | 1.7037 | -25 |
| -24 | 150.6 | 121.9 | 0.0008 | 0.1555 | 1323.3 | 6.4301 | 168.4 | 203.7 | 372.1 | 0.8796 | 1.7028 | -24 |
| -23 | 156.8 | 127.4 | 0.0008 | 0.1491 | 1320.3 | 6.7058 | 169.7 | 203.1 | 372.7 | 0.8847 | 1.7020 | -23 |
| -22 | 163.2 | 133.2 | 0.0008 | 0.1430 | 1317.2 | 6.9908 | 171.0 | 202.4 | 373.4 | 0.8898 | 1.7012 | -22 |
| -21 | 169.8 | 139.1 | 0.0008 | 0.1373 | 1314.2 | 7.2853 | 172.3 | 201.8 | 374.0 | 0.8949 | 1.7004 | -21 |
| -20 | 176.6 | 145.2 | 0.0008 | 0.1318 | 1311.1 | 7.5895 | 173.6 | 201.1 | 374.6 | 0.9000 | 1.6997 | -20 |
| -19 | 183.6 | 151.6 | 0.0008 | 0.1265 | 1308.0 | 7.9036 | 174.9 | 200.4 | 375.3 | 0.9051 | 1.6989 | -19 |
| -18 | 190.9 | 158.1 | 0.0008 | 0.1215 | 1304.9 | 8.2279 | 176.2 | 199.8 | 375.9 | 0.9102 | 1.6982 | -18 |
| -17 | 198.3 | 164.9 | 0.0008 | 0.1168 | 1301.8 | 8.5626 | 177.5 | 199.1 | 376.5 | 0.9153 | 1.6975 | -17 |
| -16 | 206.0 | 171.9 | 0.0008 | 0.1123 | 1298.7 | 8.9080 | 178.8 | 198.4 | 377.2 | 0.9204 | 1.6968 | -16 |
| -15 | 213.9 | 179.2 | 0.0008 | 0.1079 | 1295.6 | 9.2643 | 180.1 | 197.7 | 377.8 | 0.9254 | 1.6961 | -15 |
| -14 | 222.1 | 186.6 | 0.0008 | 0.1038 | 1292.5 | 9.6319 | 181.4 | 197.0 | 378.4 | 0.9305 | 1.6955 | -14 |
| -13 | 230.5 | 194.3 | 0.0008 | 0.0999 | 1289.3 | 10.0110 | 182.7 | 196.3 | 379.0 | 0.9355 | 1.6949 | -13 |
| -12 | 239.2 | 202.3 | 0.0008 | 0.0961 | 1286.2 | 10.4010 | 184.0 | 195.6 | 379.6 | 0.9405 | 1.6942 | -12 |
| -11 | 248.1 | 210.5 | 0.0008 | 0.0926 | 1283.0 | 10.8040 | 185.3 | 194.9 | 380.3 | 0.9455 | 1.6936 | -11 |
| -10 | 257.2 | 219.0 | 0.0008 | 0.0891 | 1279.8 | 11.2190 | 186.6 | 194.2 | 380.9 | 0.9505 | 1.6931 | -10 |
| -9 | 266.7 | 227.7 | 0.0008 | 0.0859 | 1276.6 | 11.6460 | 188.0 | 193.5 | 381.5 | 0.9555 | 1.6925 | -9 |
| -8 | 276.4 | 236.7 | 0.0008 | 0.0827 | 1273.4 | 12.0870 | 189.3 | 192.8 | 382.1 | 0.9605 | 1.6920 | -8 |
| -7 | 286.3 | 245.9 | 0.0008 | 0.0797 | 1270.2 | 12.5400 | 190.6 | 192.1 | 382.7 | 0.9655 | 1.6914 | -7 |
| -6 | 296.6 | 255.5 | 0.0008 | 0.0769 | 1267.0 | 13.0070 | 192.0 | 191.4 | 383.3 | 0.9704 | 1.6909 | -6 |
| -5 | 307.1 | 265.3 | 0.0008 | 0.0741 | 1263.7 | 13.4870 | 193.3 | 190.6 | 383.9 | 0.9754 | 1.6904 | -5 |
| -4 | 317.9 | 275.4 | 0.0008 | 0.0715 | 1260.5 | 13.9820 | 194.6 | 189.9 | 384.5 | 0.9803 | 1.6899 | -4 |
| -3 | 329.0 | 285.8 | 0.0008 | 0.0690 | 1257.2 | 14.4900 | 196.0 | 189.2 | 385.1 | 0.9852 | 1.6894 | -3 |
| -2 | 340.4 | 296.5 | 0.0008 | 0.0666 | 1253.9 | 15.0140 | 197.3 | 188.4 | 385.7 | 0.9902 | 1.6890 | -2 |
| -1 | 352.1 | 307.5 | 0.0008 | 0.0643 | 1250.6 | 15.5520 | 198.7 | 187.7 | 386.3 | 0.9951 | 1.6885 | -1 |
| 0 | 364.2 | 318.8 | 0.0008 | 0.0621 | 1247.2 | 16.1060 | 200.0 | 186.9 | 386.9 | 1.0000 | 1.6881 | 0 |
| 1 | 376.5 | 330.4 | 0.0008 | 0.0600 | 1243.9 | 16.6750 | 201.4 | 186.2 | 387.5 | 1.0049 | 1.6877 | 1 |
| 2 | 389.2 | 342.4 | 0.0008 | 0.0579 | 1240.5 | 17.2610 | 202.7 | 185.4 | 388.1 | 1.0098 | 1.6873 | 2 |
| 3 | 402.1 | 354.7 | 0.0008 | 0.0560 | 1237.2 | 17.8630 | 204.1 | 184.7 | 388.7 | 1.0147 | 1.6869 | 3 |
| 4 | 415.5 | 367.3 | 0.0008 | 0.0541 | 1233.8 | 18.4810 | 205.4 | 183.9 | 389.3 | 1.0196 | 1.6865 | 4 |
| 5 | 429.1 | 380.2 | 0.0008 | 0.0523 | 1230.4 | 19.1170 | 206.8 | 183.1 | 389.9 | 1.0244 | 1.6861 | 5 |
| 6 | 443.1 | 393.5 | 0.0008 | 0.0506 | 1226.9 | 19.7700 | 208.2 | 182.3 | 390.5 | 1.0293 | 1.6857 | 6 |
| 7 | 457.4 | 407.2 | 0.0008 | 0.0489 | 1223.5 | 20.4410 | 209.5 | 181.5 | 391.0 | 1.0342 | 1.6854 | 7 |
| 8 | 472.1 | 421.2 | 0.0008 | 0.0473 | 1220.0 | 21.1310 | 210.9 | 180.7 | 391.6 | 1.0390 | 1.6850 | 8 |
| 9 | 487.2 | 435.6 | 0.0008 | 0.0458 | 1216.5 | 21.8390 | 212.3 | 179.9 | 392.2 | 1.0439 | 1.6847 | 9 |
| 10 | 502.6 | 450.3 | 0.0008 | 0.0443 | 1213.0 | 22.5660 | 213.7 | 179.1 | 392.8 | 1.0487 | 1.6843 | 10 |
| 11 | 518.4 | 465.4 | 0.0008 | 0.0429 | 1209.5 | 23.3130 | 215.0 | 178.3 | 393.3 | 1.0535 | 1.6840 | 11 |
| 12 | 534.6 | 481.0 | 0.0008 | 0.0415 | 1206.0 | 24.0800 | 216.4 | 177.5 | 393.9 | 1.0584 | 1.6837 | 12 |
| 13 | 551.1 | 496.8 | 0.0008 | 0.0402 | 1202.4 | 24.8680 | 217.8 | 176.6 | 394.4 | 1.0632 | 1.6834 | 13 |
| 14 | 568.1 | 513.1 | 0.0008 | 0.0389 | 1198.8 | 25.6770 | 219.2 | 175.8 | 395.0 | 1.0680 | 1.6831 | 14 |
| 15 | 585.4 | 529.8 | 0.0008 | 0.0377 | 1195.2 | 26.5060 | 220.6 | 174.9 | 395.6 | 1.0728 | 1.6828 | 15 |
| 16 | 603.1 | 546.9 | 0.0008 | 0.0366 | 1191.6 | 27.3580 | 222.0 | 174.1 | 396.1 | 1.0776 | 1.6825 | 16 |
| 17 | 621.3 | 564.4 | 0.0008 | 0.0354 | 1187.9 | 28.2330 | 223.4 | 173.2 | 396.7 | 1.0824 | 1.6822 | 17 |
| 18 | 639.8 | 582.3 | 0.0008 | 0.0343 | 1184.2 | 29.1300 | 224.8 | 172.4 | 397.2 | 1.0872 | 1.6819 | 18 |
| 19 | 658.8 | 600.7 | 0.0008 | 0.0333 | 1180.5 | 30.0510 | 226.2 | 171.5 | 397.7 | 1.0920 | 1.6816 | 19 |

Table 1 (continued)
DuPont™ ISCEON® MO49 (R-413A) 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 | |
| 20 | 678.2 | 619.5 | 0.0008 | 0.0323 | 1176.8 | 30.9970 | 227.7 | 170.6 | 398.3 | 1.0968 | 1.6814 | 20 |
| 21 | 698.1 | 638.7 | 0.0009 | 0.0313 | 1173.1 | 31.9670 | 229.1 | 169.7 | 398.8 | 1.1016 | 1.6811 | 21 |
| 22 | 718.3 | 658.4 | 0.0009 | 0.0303 | 1169.3 | 32.9620 | 230.5 | 168.8 | 399.3 | 1.1064 | 1.6808 | 22 |
| 23 | 739.0 | 678.5 | 0.0009 | 0.0294 | 1165.5 | 33.9830 | 231.9 | 167.9 | 399.9 | 1.1111 | 1.6806 | 23 |
| 24 | 760.2 | 699.1 | 0.0009 | 0.0285 | 1161.6 | 35.0310 | 233.4 | 167.0 | 400.4 | 1.1159 | 1.6803 | 24 |
| 25 | 781.8 | 720.2 | 0.0009 | 0.0277 | 1157.8 | 36.1060 | 234.8 | 166.1 | 400.9 | 1.1207 | 1.6800 | 25 |
| 26 | 803.9 | 741.7 | 0.0009 | 0.0269 | 1153.9 | 37.2090 | 236.3 | 165.1 | 401.4 | 1.1254 | 1.6798 | 26 |
| 27 | 826.5 | 763.7 | 0.0009 | 0.0261 | 1150.0 | 38.3400 | 237.7 | 164.2 | 401.9 | 1.1302 | 1.6795 | 27 |
| 28 | 849.5 | 786.2 | 0.0009 | 0.0253 | 1146.0 | 39.5010 | 239.2 | 163.3 | 402.4 | 1.1350 | 1.6792 | 28 |
| 29 | 873.1 | 809.2 | 0.0009 | 0.0246 | 1142.1 | 40.6920 | 240.6 | 162.3 | 402.9 | 1.1397 | 1.6790 | 29 |
| 30 | 897.1 | 832.7 | 0.0009 | 0.0239 | 1138.0 | 41.9140 | 242.1 | 161.3 | 403.4 | 1.1445 | 1.6788 | 30 |
| 31 | 921.6 | 856.7 | 0.0009 | 0.0232 | 1134.0 | 43.1680 | 243.5 | 160.3 | 403.9 | 1.1492 | 1.6785 | 31 |
| 32 | 946.6 | 881.2 | 0.0009 | 0.0225 | 1129.9 | 44.4550 | 245.0 | 159.4 | 404.4 | 1.1540 | 1.6783 | 32 |
| 33 | 972.1 | 906.2 | 0.0009 | 0.0218 | 1125.8 | 45.7740 | 246.5 | 158.4 | 404.8 | 1.1588 | 1.6780 | 33 |
| 34 | 998.2 | 931.8 | 0.0009 | 0.0212 | 1121.7 | 47.1290 | 248.0 | 157.3 | 405.3 | 1.1635 | 1.6778 | 34 |
| 35 | 1024.7 | 957.9 | 0.0009 | 0.0206 | 1117.5 | 48.5180 | 249.5 | 156.3 | 405.8 | 1.1683 | 1.6775 | 35 |
| 36 | 1051.8 | 984.5 | 0.0009 | 0.0200 | 1113.3 | 49.9440 | 250.9 | 155.3 | 406.2 | 1.1730 | 1.6772 | 36 |
| 37 | 1079.5 | 1011.7 | 0.0009 | 0.0195 | 1109.0 | 51.4080 | 252.4 | 154.3 | 406.7 | 1.1778 | 1.6770 | 37 |
| 38 | 1107.6 | 1039.5 | 0.0009 | 0.0189 | 1104.7 | 52.9090 | 253.9 | 153.2 | 407.1 | 1.1825 | 1.6767 | 38 |
| 39 | 1136.4 | 1067.8 | 0.0009 | 0.0184 | 1100.4 | 54.4510 | 255.5 | 152.1 | 407.6 | 1.1873 | 1.6764 | 39 |
| 40 | 1165.7 | 1096.7 | 0.0009 | 0.0178 | 1096.0 | 56.0330 | 257.0 | 151.1 | 408.0 | 1.1920 | 1.6761 | 40 |
| 41 | 1195.5 | 1126.2 | 0.0009 | 0.0173 | 1091.6 | 57.6570 | 258.5 | 150.0 | 408.4 | 1.1968 | 1.6758 | 41 |
| 42 | 1226.0 | 1156.2 | 0.0009 | 0.0169 | 1087.1 | 59.3250 | 260.0 | 148.9 | 408.9 | 1.2016 | 1.6755 | 42 |
| 43 | 1257.0 | 1186.9 | 0.0009 | 0.0164 | 1082.6 | 61.0370 | 261.6 | 147.7 | 409.3 | 1.2063 | 1.6752 | 43 |
| 44 | 1288.6 | 1218.2 | 0.0009 | 0.0159 | 1078.1 | 62.7950 | 263.1 | 146.6 | 409.7 | 1.2111 | 1.6749 | 44 |
| 45 | 1320.8 | 1250.1 | 0.0009 | 0.0155 | 1073.5 | 64.6010 | 264.6 | 145.5 | 410.1 | 1.2159 | 1.6746 | 45 |
| 46 | 1353.6 | 1282.6 | 0.0009 | 0.0150 | 1068.8 | 66.4560 | 266.2 | 144.3 | 410.5 | 1.2206 | 1.6743 | 46 |
| 47 | 1387.0 | 1315.7 | 0.0009 | 0.0146 | 1064.1 | 68.3620 | 267.7 | 143.1 | 410.9 | 1.2254 | 1.6739 | 47 |
| 48 | 1421.1 | 1349.5 | 0.0009 | 0.0142 | 1059.4 | 70.3200 | 269.3 | 141.9 | 411.2 | 1.2302 | 1.6736 | 48 |
| 49 | 1455.8 | 1383.9 | 0.0009 | 0.0138 | 1054.5 | 72.3330 | 270.9 | 140.7 | 411.6 | 1.2350 | 1.6732 | 49 |
| 50 | 1491.1 | 1419.0 | 0.0010 | 0.0134 | 1049.7 | 74.4020 | 272.5 | 139.5 | 412.0 | 1.2398 | 1.6728 | 50 |
| 51 | 1527.0 | 1454.7 | 0.0010 | 0.0131 | 1044.7 | 76.5290 | 274.1 | 138.3 | 412.3 | 1.2446 | 1.6725 | 51 |
| 52 | 1563.7 | 1491.1 | 0.0010 | 0.0127 | 1039.8 | 78.7170 | 275.7 | 137.0 | 412.6 | 1.2494 | 1.6721 | 52 |
| 53 | 1600.9 | 1528.2 | 0.0010 | 0.0124 | 1034.7 | 80.9680 | 277.3 | 135.7 | 413.0 | 1.2542 | 1.6716 | 53 |
| 54 | 1638.9 | 1566.0 | 0.0010 | 0.0120 | 1029.6 | 83.2830 | 278.9 | 134.4 | 413.3 | 1.2590 | 1.6712 | 54 |
| 55 | 1677.5 | 1604.5 | 0.0010 | 0.0117 | 1024.4 | 85.6670 | 280.5 | 133.1 | 413.6 | 1.2639 | 1.6707 | 55 |
| 56 | 1716.8 | 1643.7 | 0.0010 | 0.0113 | 1019.1 | 88.1210 | 282.1 | 131.8 | 413.9 | 1.2687 | 1.6703 | 56 |
| 57 | 1756.8 | 1683.6 | 0.0010 | 0.0110 | 1013.8 | 90.6490 | 283.8 | 130.4 | 414.2 | 1.2736 | 1.6698 | 57 |
| 58 | 1797.5 | 1724.2 | 0.0010 | 0.0107 | 1008.4 | 93.2530 | 285.4 | 129.0 | 414.4 | 1.2785 | 1.6692 | 58 |
| 59 | 1839.0 | 1765.6 | 0.0010 | 0.0104 | 1002.9 | 95.9370 | 287.1 | 127.6 | 414.7 | 1.2833 | 1.6687 | 59 |
| 60 | 1881.1 | 1807.8 | 0.0010 | 0.0101 | 997.3 | 98.7050 | 288.7 | 126.2 | 414.9 | 1.2882 | 1.6681 | 60 |
| 61 | 1924.0 | 1850.6 | 0.0010 | 0.0098 | 991.6 | 101.5600 | 290.4 | 124.8 | 415.2 | 1.2931 | 1.6675 | 61 |
| 62 | 1967.6 | 1894.3 | 0.0010 | 0.0096 | 985.8 | 104.5100 | 292.1 | 123.3 | 415.4 | 1.2981 | 1.6669 | 62 |
| 63 | 2012.0 | 1938.7 | 0.0010 | 0.0093 | 980.0 | 107.5500 | 293.8 | 121.8 | 415.6 | 1.3030 | 1.6663 | 63 |
| 64 | 2057.2 | 1984.0 | 0.0010 | 0.0090 | 974.0 | 110.6900 | 295.5 | 120.2 | 415.8 | 1.3080 | 1.6656 | 64 |
| 65 | 2103.1 | 2030.0 | 0.0010 | 0.0088 | 967.9 | 113.9400 | 297.3 | 118.7 | 415.9 | 1.3129 | 1.6649 | 65 |
| 66 | 2149.8 | 2076.9 | 0.0010 | 0.0085 | 961.7 | 117.3100 | 299.0 | 117.1 | 416.1 | 1.3179 | 1.6641 | 66 |
| 67 | 2197.3 | 2124.5 | 0.0010 | 0.0083 | 955.4 | 120.7900 | 300.8 | 115.5 | 416.2 | 1.3230 | 1.6633 | 67 |
| 68 | 2245.6 | 2173.1 | 0.0011 | 0.0080 | 949.0 | 124.3900 | 302.5 | 113.8 | 416.3 | 1.3280 | 1.6625 | 68 |
| 69 | 2294.7 | 2222.4 | 0.0011 | 0.0078 | 942.4 | 128.1300 | 304.3 | 112.1 | 416.4 | 1.3331 | 1.6616 | 69 |
| 70 | 2344.7 | 2272.7 | 0.0011 | 0.0076 | 935.7 | 132.0100 | 306.1 | 110.4 | 416.5 | 1.3382 | 1.6606 | 70 |
| 71 | 2395.5 | 2323.8 | 0.0011 | 0.0074 | 928.8 | 136.0300 | 307.9 | 108.6 | 416.5 | 1.3433 | 1.6597 | 71 |
| 72 | 2447.1 | 2375.8 | 0.0011 | 0.0071 | 921.8 | 140.2200 | 309.8 | 106.8 | 416.5 | 1.3485 | 1.6586 | 72 |
| 73 | 2499.6 | 2428.7 | 0.0011 | 0.0069 | 914.6 | 144.5800 | 311.6 | 104.9 | 416.5 | 1.3537 | 1.6575 | 73 |
| 74 | 2553.0 | 2482.6 | 0.0011 | 0.0067 | 907.2 | 149.1200 | 313.5 | 103.0 | 416.5 | 1.3589 | 1.6563 | 74 |
| 75 | 2607.3 | 2537.3 | 0.0011 | 0.0065 | 899.6 | 153.8500 | 315.4 | 101.0 | 416.4 | 1.3642 | 1.6551 | 75 |
| 76 | 2662.5 | 2593.1 | 0.0011 | 0.0063 | 891.8 | 158.8000 | 317.3 | 99.0 | 416.3 | 1.3696 | 1.6538 | 76 |
| 77 | 2718.6 | 2649.8 | 0.0011 | 0.0061 | 883.7 | 163.9800 | 319.3 | 96.9 | 416.2 | 1.3750 | 1.6524 | 77 |
| 78 | 2775.6 | 2707.5 | 0.0011 | 0.0059 | 875.4 | 169.4100 | 321.3 | 94.8 | 416.0 | 1.3804 | 1.6509 | 78 |
| 79 | 2833.6 | 2766.3 | 0.0012 | 0.0057 | 866.8 | 175.1100 | 323.3 | 92.5 | 415.8 | 1.3859 | 1.6493 | 79 |

Table 1 (continued)
DuPont™ ISCEON® MO49 (R-413A) 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 | 2892.6 | 2826.0 | 0.0012 | 0.0055 | 857.9 | 181.1200 | 325.3 | 90.2 | 415.5 | 1.3915 | 1.6476 | 80 |
| 81 | 2952.5 | 2886.9 | 0.0012 | 0.0053 | 848.7 | 187.4600 | 327.4 | 87.8 | 415.2 | 1.3972 | 1.6457 | 81 |
| 82 | 3013.4 | 2948.8 | 0.0012 | 0.0052 | 839.0 | 194.1700 | 329.5 | 85.3 | 414.8 | 1.4029 | 1.6438 | 82 |
| 83 | 3075.4 | 3011.9 | 0.0012 | 0.0050 | 828.9 | 201.3000 | 331.6 | 82.7 | 414.4 | 1.4088 | 1.6416 | 83 |
| 84 | 3138.4 | 3076.0 | 0.0012 | 0.0048 | 818.3 | 208.9000 | 333.9 | 80.0 | 413.9 | 1.4148 | 1.6393 | 84 |
| 85 | 3202.4 | 3141.4 | 0.0012 | 0.0046 | 807.2 | 217.0400 | 336.1 | 77.1 | 413.3 | 1.4209 | 1.6368 | 85 |
| 86 | 3267.5 | 3208.0 | 0.0013 | 0.0044 | 795.4 | 225.8100 | 338.5 | 74.1 | 412.6 | 1.4272 | 1.6340 | 86 |
| 87 | 3333.6 | 3275.9 | 0.0013 | 0.0042 | 782.7 | 235.3200 | 340.9 | 70.9 | 411.8 | 1.4337 | 1.6310 | 87 |
| 88 | 3400.9 | 3345.1 | 0.0013 | 0.0041 | 769.2 | 245.7200 | 343.4 | 67.5 | 410.8 | 1.4404 | 1.6276 | 88 |
| 89 | 3469.3 | 3415.7 | 0.0013 | 0.0039 | 754.4 | 257.2100 | 346.0 | 63.7 | 409.7 | 1.4474 | 1.6237 | 89 |
| 90 | 3538.9 | 3487.7 | 0.0014 | 0.0037 | 738.2 | 270.0800 | 348.8 | 59.6 | 408.4 | 1.4548 | 1.6194 | 90 |

Table 2
DuPont™ ISCEON® MO49 (R-413A) 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 |
|-------------|------------|---------|----------|------------|---------|----------|------------|---------|----------|------------|---------|----------|-------------|
| | (-68.28°C) | | | (-57.98°C) | | | (-51.34°C) | | | (-46.33°C) | | | |
| | V | H | S | V | H | S | V | H | S | V | H | S | |
| | (1.6248) | (343.5) | (1.7719) | (0.8487) | (350.2) | (1.7487) | (0.5805) | (354.5) | (1.7365) | (0.4434) | (357.7) | (1.7284) | |
| -65 | 1.6517 | 345.8 | 1.7828 | - | - | - | - | - | - | - | - | - | -65 |
| -60 | 1.6927 | 349.3 | 1.7993 | - | - | - | - | - | - | - | - | - | -60 |
| -55 | 1.7336 | 352.8 | 1.8156 | 0.8611 | 352.3 | 1.7585 | - | - | - | - | - | - | -55 |
| -50 | 1.7743 | 356.3 | 1.8317 | 0.8819 | 355.9 | 1.7748 | 0.5843 | 355.4 | 1.7409 | - | - | - | -50 |
| -45 | 1.8150 | 359.9 | 1.8477 | 0.9026 | 359.5 | 1.7910 | 0.5984 | 359.1 | 1.7572 | 0.4462 | 358.7 | 1.7328 | -45 |
| -40 | 1.8556 | 363.6 | 1.8635 | 0.9232 | 363.2 | 1.8069 | 0.6123 | 362.8 | 1.7733 | 0.4569 | 362.5 | 1.7491 | -40 |
| -35 | 1.8962 | 367.3 | 1.8792 | 0.9437 | 366.9 | 1.8227 | 0.6262 | 366.6 | 1.7892 | 0.4675 | 366.2 | 1.7651 | -35 |
| -30 | 1.9367 | 371.0 | 1.8947 | 0.9643 | 370.7 | 1.8384 | 0.6401 | 370.4 | 1.8049 | 0.4780 | 370.1 | 1.7810 | -30 |
| -25 | 1.9771 | 374.8 | 1.9102 | 0.9847 | 374.5 | 1.8539 | 0.6539 | 374.2 | 1.8205 | 0.4885 | 373.9 | 1.7966 | -25 |
| -20 | 2.0175 | 378.6 | 1.9255 | 1.0051 | 378.4 | 1.8692 | 0.6676 | 378.1 | 1.8360 | 0.4989 | 377.8 | 1.8122 | -20 |
| -15 | 2.0579 | 382.5 | 1.9407 | 1.0255 | 382.3 | 1.8845 | 0.6814 | 382.0 | 1.8513 | 0.5093 | 381.7 | 1.8276 | -15 |
| -10 | 2.0982 | 386.5 | 1.9558 | 1.0459 | 386.2 | 1.8996 | 0.6950 | 386.0 | 1.8665 | 0.5196 | 385.7 | 1.8428 | -10 |
| -5 | 2.1385 | 390.4 | 1.9707 | 1.0662 | 390.2 | 1.9147 | 0.7087 | 390.0 | 1.8816 | 0.5300 | 389.7 | 1.8579 | -5 |
| 0 | 2.1788 | 394.5 | 1.9856 | 1.0865 | 394.2 | 1.9296 | 0.7223 | 394.0 | 1.8966 | 0.5403 | 393.8 | 1.8730 | 0 |
| 5 | 2.2191 | 398.5 | 2.0004 | 1.1067 | 398.3 | 1.9444 | 0.7360 | 398.1 | 1.9114 | 0.5506 | 397.9 | 1.8879 | 5 |
| 10 | 2.2594 | 402.6 | 2.0150 | 1.1270 | 402.4 | 1.9591 | 0.7496 | 402.3 | 1.9262 | 0.5608 | 402.1 | 1.9026 | 10 |
| 15 | 2.2996 | 406.8 | 2.0296 | 1.1472 | 406.6 | 1.9737 | 0.7631 | 406.4 | 1.9408 | 0.5711 | 406.2 | 1.9173 | 15 |
| 20 | 2.3398 | 411.0 | 2.0441 | 1.1675 | 410.8 | 1.9882 | 0.7767 | 410.7 | 1.9553 | 0.5813 | 410.5 | 1.9319 | 20 |
| 25 | 2.3800 | 415.3 | 2.0585 | 1.1877 | 415.1 | 2.0026 | 0.7902 | 414.9 | 1.9698 | 0.5915 | 414.8 | 1.9464 | 25 |
| 30 | 2.4202 | 419.6 | 2.0728 | 1.2079 | 419.4 | 2.0170 | 0.8038 | 419.2 | 1.9842 | 0.6017 | 419.1 | 1.9608 | 30 |
| 35 | 2.4604 | 423.9 | 2.0870 | 1.2281 | 423.8 | 2.0312 | 0.8173 | 423.6 | 1.9984 | 0.6119 | 423.5 | 1.9750 | 35 |
| 40 | 2.5005 | 428.3 | 2.1012 | 1.2482 | 428.2 | 2.0454 | 0.8308 | 428.0 | 2.0126 | 0.6221 | 427.9 | 1.9892 | 40 |
| 45 | 2.5407 | 432.7 | 2.1152 | 1.2684 | 432.6 | 2.0594 | 0.8443 | 432.5 | 2.0267 | 0.6322 | 432.3 | 2.0034 | 45 |
| 50 | 2.5808 | 437.2 | 2.1292 | 1.2885 | 437.1 | 2.0734 | 0.8578 | 437.0 | 2.0407 | 0.6424 | 436.8 | 2.0174 | 50 |
| 55 | 2.6210 | 441.8 | 2.1431 | 1.3087 | 441.6 | 2.0874 | 0.8713 | 441.5 | 2.0546 | 0.6525 | 441.4 | 2.0313 | 55 |
| 60 | 2.6611 | 446.3 | 2.1569 | 1.3288 | 446.2 | 2.1012 | 0.8847 | 446.1 | 2.0685 | 0.6627 | 446.0 | 2.0452 | 60 |
| 65 | 2.7012 | 450.9 | 2.1707 | 1.3489 | 450.8 | 2.1150 | 0.8982 | 450.7 | 2.0823 | 0.6728 | 450.6 | 2.0590 | 65 |
| 70 | 2.7414 | 455.6 | 2.1843 | 1.3691 | 455.5 | 2.1286 | 0.9116 | 455.4 | 2.0960 | 0.6829 | 455.3 | 2.0727 | 70 |
| 75 | 2.7815 | 460.3 | 2.1979 | 1.3892 | 460.2 | 2.1423 | 0.9251 | 460.1 | 2.1096 | 0.6930 | 460.0 | 2.0864 | 75 |
| 80 | 2.8216 | 465.0 | 2.2115 | 1.4093 | 464.9 | 2.1558 | 0.9385 | 464.8 | 2.1232 | 0.7032 | 464.7 | 2.0999 | 80 |
| 85 | 2.8617 | 469.8 | 2.2249 | 1.4294 | 469.7 | 2.1693 | 0.9520 | 469.6 | 2.1366 | 0.7133 | 469.5 | 2.1134 | 85 |

ABSOLUTE PRESSURE, kPa

| TEMP. °C | 50 | | | 60 | | | 70 | | | 80 | | | TEMP. °C |
|-------------|------------|----------|----------|------------|---------|----------|------------|---------|----------|------------|---------|----------|-------------|
| | (-42.24°C) | | | (-38.77°C) | | | (-35.74°C) | | | (-33.04°C) | | | |
| | V | H | S | V | H | S | V | H | S | V | H | S | |
| | (0.3597) | (360.37) | (1.7226) | (0.3031) | (362.6) | (1.7181) | (0.2623) | (364.6) | (1.7145) | (0.2313) | (366.3) | (1.7115) | |
| -40 | 0.3636 | 362.1 | 1.7299 | - | - | - | - | - | - | - | - | - | -40 |
| -35 | 0.3722 | 365.9 | 1.7461 | 0.3086 | 365.5 | 1.7304 | 0.2632 | 365.2 | 1.7169 | - | - | - | -35 |
| -30 | 0.3807 | 369.7 | 1.7621 | 0.3158 | 369.4 | 1.7465 | 0.2695 | 369.1 | 1.7331 | 0.2347 | 368.7 | 1.7214 | -30 |
| -25 | 0.3892 | 373.6 | 1.7779 | 0.3230 | 373.3 | 1.7624 | 0.2757 | 373.0 | 1.7491 | 0.2402 | 372.7 | 1.7375 | -25 |
| -20 | 0.3976 | 377.5 | 1.7935 | 0.3301 | 377.2 | 1.7781 | 0.2819 | 376.9 | 1.7649 | 0.2457 | 376.7 | 1.7534 | -20 |
| -15 | 0.4060 | 381.5 | 1.8090 | 0.3372 | 381.2 | 1.7936 | 0.2880 | 380.9 | 1.7805 | 0.2511 | 380.7 | 1.7690 | -15 |
| -10 | 0.4144 | 385.5 | 1.8243 | 0.3442 | 385.2 | 1.8090 | 0.2941 | 380.5 | 1.7960 | 0.2565 | 384.7 | 1.7846 | -10 |
| -5 | 0.4227 | 389.5 | 1.8395 | 0.3512 | 389.3 | 1.8242 | 0.3001 | 389.0 | 1.8112 | 0.2618 | 388.8 | 1.7999 | -5 |
| 0 | 0.4310 | 393.6 | 1.8545 | 0.3582 | 393.4 | 1.8393 | 0.3062 | 393.1 | 1.8264 | 0.2671 | 392.9 | 1.8151 | 0 |
| 5 | 0.4393 | 397.7 | 1.8695 | 0.3651 | 397.5 | 1.8543 | 0.3122 | 397.3 | 1.8414 | 0.2724 | 397.1 | 1.8302 | 5 |
| 10 | 0.4476 | 401.9 | 1.8843 | 0.3721 | 401.7 | 1.8692 | 0.3181 | 401.5 | 1.8563 | 0.2777 | 401.3 | 1.8451 | 10 |
| 15 | 0.4558 | 406.1 | 1.8990 | 0.3790 | 405.9 | 1.8839 | 0.3241 | 405.7 | 1.8711 | 0.2829 | 405.5 | 1.8599 | 15 |
| 20 | 0.4640 | 410.3 | 1.9136 | 0.3859 | 410.1 | 1.8986 | 0.3301 | 409.9 | 1.8858 | 0.2882 | 409.8 | 1.8747 | 20 |
| 25 | 0.4723 | 414.6 | 1.9281 | 0.3928 | 414.4 | 1.9131 | 0.3360 | 414.2 | 1.9004 | 0.2934 | 414.1 | 1.8892 | 25 |
| 30 | 0.4805 | 418.9 | 1.9425 | 0.3996 | 418.8 | 1.9275 | 0.3419 | 418.6 | 1.9148 | 0.2986 | 418.4 | 1.9037 | 30 |
| 35 | 0.4887 | 423.3 | 1.9568 | 0.4065 | 423.1 | 1.9419 | 0.3478 | 423.0 | 1.9292 | 0.3038 | 422.8 | 1.9181 | 35 |
| 40 | 0.4968 | 427.7 | 1.9711 | 0.4133 | 427.6 | 1.9561 | 0.3537 | 427.4 | 1.9434 | 0.3090 | 427.3 | 1.9324 | 40 |
| 45 | 0.5050 | 432.2 | 1.9852 | 0.4202 | 432.0 | 1.9703 | 0.3596 | 431.9 | 1.9576 | 0.3141 | 431.7 | 1.9466 | 45 |
| 50 | 0.5132 | 436.7 | 1.9992 | 0.4270 | 436.5 | 1.9843 | 0.3654 | 436.4 | 1.9717 | 0.3193 | 436.3 | 1.9607 | 50 |
| 55 | 0.5213 | 441.2 | 2.0132 | 0.4338 | 441.1 | 1.9983 | 0.3713 | 441.0 | 1.9857 | 0.3244 | 440.8 | 1.9747 | 55 |
| 60 | 0.5294 | 445.8 | 2.0271 | 0.4406 | 445.7 | 2.0122 | 0.3772 | 445.6 | 1.9996 | 0.3296 | 445.4 | 1.9887 | 60 |
| 65 | 0.5376 | 450.5 | 2.0409 | 0.4474 | 450.3 | 2.0261 | 0.3830 | 450.2 | 2.0135 | 0.3347 | 450.1 | 2.0025 | 65 |
| 70 | 0.5457 | 455.1 | 2.0546 | 0.4542 | 455.0 | 2.0398 | 0.3889 | 454.9 | 2.0272 | 0.3398 | 454.8 | 2.0163 | 70 |
| 75 | 0.5538 | 459.9 | 2.0683 | 0.4610 | 459.7 | 2.0535 | 0.3947 | 459.6 | 2.0409 | 0.3450 | 459.5 | 2.0300 | 75 |
| 80 | 0.5619 | 464.6 | 2.0819 | 0.4678 | 464.5 | 2.0671 | 0.4005 | 464.4 | 2.0545 | 0.3501 | 464.3 | 2.0436 | 80 |
| 85 | 0.5700 | 469.4 | 2.0954 | 0.4745 | 469.3 | 2.0806 | 0.4063 | 469.2 | 2.0680 | 0.3552 | 469.1 | 2.0571 | 85 |
| 90 | 0.5781 | 474.3 | 2.1088 | 0.4813 | 474.2 | 2.0940 | 0.4122 | 474.1 | 2.0815 | 0.3603 | 474.0 | 2.0706 | 90 |
| 95 | 0.5862 | 479.2 | 2.1222 | 0.4881 | 479.1 | 2.1074 | 0.4180 | 479.0 | 2.0949 | 0.3654 | 478.9 | 2.0840 | 95 |
| 100 | 0.5943 | 484.1 | 2.1355 | 0.4948 | 484.0 | 2.1207 | 0.4238 | 483.9 | 2.1082 | 0.3705 | 483.8 | 2.0973 | 100 |
| 105 | 0.6024 | 489.1 | 2.1487 | 0.5016 | 489.0 | 2.1340 | 0.4296 | 488.9 | 2.1214 | 0.3756 | 488.8 | 2.1106 | 105 |
| 110 | 0.6105 | 494.1 | 2.1619 | 0.5083 | 494.0 | 2.1471 | 0.4354 | 493.9 | 2.1346 | 0.3806 | 493.8 | 2.1238 | 110 |

Table 2 (continued)
DuPont™ ISCEON® MO49 (R-413A) 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 | 1400 | | | 1500 | | | 1600 | | | 1700 | | | |
| | (49.46°C) | | | (52.24°C) | | | (54.88°C) | | | (57.41°C) | | | |
| | V | H | S | V | H | S | V | H | S | V | H | S | |
| (0.0137) | (411.8) | (1.6731) | (0.0126) | (412.7) | (1.672) | (0.0117) | (413.6) | (1.6708) | (0.0109) | (414.3) | (1.6696) | | |
| 50 | 0.0137 | 412.5 | 1.6752 | — | — | — | — | — | — | — | — | — | 50 |
| 55 | 0.0143 | 418.7 | 1.6944 | 0.0129 | 416.32 | 1.6830 | 0.0117 | 413.7 | 1.6713 | — | — | — | 55 |
| 60 | 0.0149 | 424.7 | 1.7126 | 0.0135 | 422.60 | 1.7020 | 0.0123 | 420.3 | 1.6913 | 0.0112 | 417.9 | 1.6804 | 60 |
| 65 | 0.0154 | 430.6 | 1.7301 | 0.0140 | 428.67 | 1.7200 | 0.0128 | 426.6 | 1.7101 | 0.0117 | 424.5 | 1.7001 | 65 |
| 70 | 0.0159 | 436.4 | 1.7470 | 0.0145 | 434.59 | 1.7374 | 0.0133 | 432.8 | 1.7280 | 0.0122 | 430.8 | 1.7186 | 70 |
| 75 | 0.0163 | 442.0 | 1.7634 | 0.0150 | 440.41 | 1.7543 | 0.0137 | 438.7 | 1.7453 | 0.0127 | 437.0 | 1.7364 | 75 |
| 80 | 0.0168 | 447.7 | 1.7795 | 0.0154 | 446.16 | 1.7707 | 0.0142 | 444.6 | 1.7620 | 0.0131 | 443.0 | 1.7536 | 80 |
| 85 | 0.0172 | 453.3 | 1.7952 | 0.0158 | 451.85 | 1.7867 | 0.0146 | 450.4 | 1.7783 | 0.0135 | 448.9 | 1.7702 | 85 |
| 90 | 0.0177 | 458.8 | 1.8107 | 0.0162 | 457.50 | 1.8023 | 0.0150 | 456.1 | 1.7943 | 0.0139 | 454.7 | 1.7864 | 90 |
| 95 | 0.0181 | 464.4 | 1.8259 | 0.0167 | 463.13 | 1.8177 | 0.0154 | 461.8 | 1.8099 | 0.0143 | 460.5 | 1.8022 | 95 |
| 100 | 0.0185 | 469.9 | 1.8408 | 0.0170 | 468.74 | 1.8328 | 0.0158 | 467.5 | 1.8252 | 0.0147 | 466.3 | 1.8178 | 100 |
| 105 | 0.0189 | 475.5 | 1.8556 | 0.0174 | 474.33 | 1.8478 | 0.0162 | 473.2 | 1.8403 | 0.0150 | 472.0 | 1.8330 | 105 |
| 110 | 0.0193 | 481.0 | 1.8701 | 0.0178 | 479.93 | 1.8625 | 0.0165 | 478.8 | 1.8551 | 0.0154 | 477.7 | 1.8480 | 110 |
| 115 | 0.0197 | 486.6 | 1.8845 | 0.0182 | 485.52 | 1.8770 | 0.0169 | 484.5 | 1.8697 | 0.0157 | 483.4 | 1.8628 | 115 |
| 120 | 0.0201 | 492.1 | 1.8987 | 0.0186 | 491.13 | 1.8913 | 0.0172 | 490.1 | 1.8842 | 0.0161 | 489.1 | 1.8774 | 120 |
| 125 | 0.0204 | 497.7 | 1.9128 | 0.0189 | 496.73 | 1.9055 | 0.0176 | 495.8 | 1.8985 | 0.0164 | 494.8 | 1.8918 | 125 |
| 130 | 0.0208 | 503.3 | 1.9267 | 0.0193 | 502.35 | 1.9195 | 0.0179 | 501.4 | 1.9126 | 0.0167 | 500.5 | 1.9060 | 130 |
| 135 | 0.0212 | 508.9 | 1.9405 | 0.0196 | 507.99 | 1.9334 | 0.0182 | 507.1 | 1.9266 | 0.0170 | 506.2 | 1.9201 | 135 |
| 140 | 0.0215 | 514.5 | 1.9542 | 0.0200 | 513.64 | 1.9472 | 0.0186 | 512.8 | 1.9404 | 0.0174 | 511.9 | 1.9340 | 140 |
| 145 | 0.0219 | 520.1 | 1.9678 | 0.0203 | 519.31 | 1.9608 | 0.0189 | 518.5 | 1.9542 | 0.0177 | 517.7 | 1.9478 | 145 |
| 150 | 0.0223 | 525.8 | 1.9812 | 0.0206 | 525.00 | 1.9743 | 0.0192 | 524.2 | 1.9678 | 0.0180 | 523.4 | 1.9615 | 150 |
| 155 | 0.0226 | 531.5 | 1.9946 | 0.0210 | 530.71 | 1.9877 | 0.0195 | 530.0 | 1.9812 | 0.0183 | 529.2 | 1.9750 | 155 |
| 160 | 0.0230 | 537.2 | 2.0078 | 0.0213 | 536.44 | 2.0010 | 0.0199 | 535.7 | 1.9946 | 0.0186 | 535.0 | 1.9885 | 160 |
| 165 | 0.0233 | 542.9 | 2.0210 | 0.0216 | 542.19 | 2.0142 | 0.0202 | 541.5 | 2.0079 | 0.0189 | 540.8 | 2.0018 | 165 |
| 170 | 0.0236 | 548.7 | 2.0340 | 0.0220 | 547.97 | 2.0274 | 0.0205 | 547.3 | 2.0210 | 0.0192 | 546.6 | 2.0150 | 170 |
| 175 | 0.0240 | 554.4 | 2.0470 | 0.0223 | 553.78 | 2.0404 | 0.0208 | 553.1 | 2.0341 | 0.0195 | 552.5 | 2.0281 | 175 |

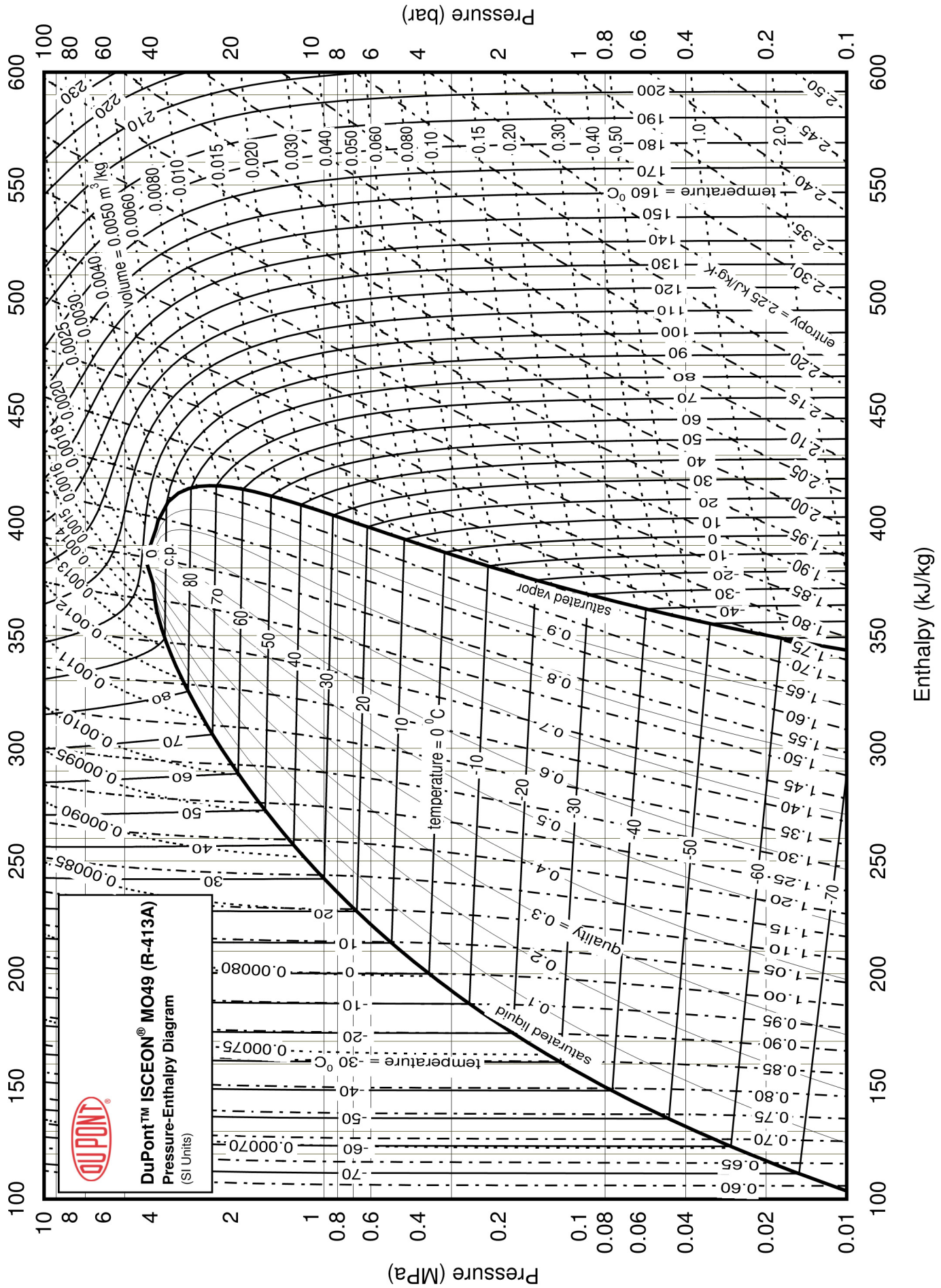
| ABSOLUTE PRESSURE, kPa | | | | | | | | | | | | | TEMP. °C |
|------------------------|-----------|----------|----------|-----------|----------|----------|-----------|----------|----------|-----------|---------|--------|-------------|
| TEMP. °C | 1800 | | | 1900 | | | 2000 | | | 2200 | | | |
| | (59.82°C) | | | (62.13°C) | | | (64.35°C) | | | (68.55°C) | | | |
| | V | H | S | V | H | S | V | H | S | V | H | S | |
| (0.0102) | (414.9) | (1.6682) | (0.0095) | (415.4) | (1.6668) | (0.0089) | (415.8) | (1.6653) | (0.0079) | (416.4) | (1.662) | | |
| 60 | 0.0102 | 415.2 | 1.6690 | — | — | — | — | — | — | — | — | — | 60 |
| 65 | 0.0108 | 422.2 | 1.6899 | — | — | — | — | — | — | — | — | — | 65 |
| 70 | 0.0112 | 428.8 | 1.7092 | 0.0104 | 426.55 | 1.6997 | 0.0095 | 424.2 | 1.6899 | 0.0081 | 418.8 | 1.6690 | 70 |
| 75 | 0.0117 | 435.1 | 1.7276 | 0.0108 | 433.14 | 1.7187 | 0.0100 | 431.1 | 1.7098 | 0.0086 | 426.5 | 1.6913 | 75 |
| 80 | 0.0121 | 441.3 | 1.7452 | 0.0113 | 439.49 | 1.7369 | 0.0105 | 437.6 | 1.7285 | 0.0090 | 433.6 | 1.7116 | 80 |
| 85 | 0.0125 | 447.3 | 1.7622 | 0.0117 | 445.68 | 1.7543 | 0.0109 | 444.0 | 1.7464 | 0.0095 | 440.4 | 1.7307 | 85 |
| 90 | 0.0129 | 453.3 | 1.7787 | 0.0120 | 451.76 | 1.7711 | 0.0112 | 450.2 | 1.7636 | 0.0098 | 446.9 | 1.7488 | 90 |
| 95 | 0.0133 | 459.2 | 1.7948 | 0.0124 | 457.75 | 1.7875 | 0.0116 | 456.3 | 1.7803 | 0.0102 | 453.3 | 1.7662 | 95 |
| 100 | 0.0137 | 465.0 | 1.8105 | 0.0128 | 463.68 | 1.8035 | 0.0120 | 462.3 | 1.7966 | 0.0105 | 459.5 | 1.7830 | 100 |
| 105 | 0.0140 | 470.8 | 1.8260 | 0.0131 | 469.56 | 1.8191 | 0.0123 | 468.3 | 1.8124 | 0.0109 | 465.7 | 1.7994 | 105 |
| 110 | 0.0144 | 476.6 | 1.8412 | 0.0134 | 475.40 | 1.8345 | 0.0126 | 474.2 | 1.8280 | 0.0112 | 471.8 | 1.8154 | 110 |
| 115 | 0.0147 | 482.3 | 1.8561 | 0.0138 | 481.22 | 1.8496 | 0.0129 | 480.1 | 1.8433 | 0.0115 | 477.8 | 1.8310 | 115 |
| 120 | 0.0150 | 488.1 | 1.8708 | 0.0141 | 487.03 | 1.8644 | 0.0132 | 486.0 | 1.8583 | 0.0118 | 483.8 | 1.8463 | 120 |
| 125 | 0.0153 | 493.8 | 1.8853 | 0.0144 | 492.82 | 1.8791 | 0.0135 | 491.8 | 1.8730 | 0.0121 | 489.7 | 1.8614 | 125 |
| 130 | 0.0157 | 499.6 | 1.8997 | 0.0147 | 498.61 | 1.8935 | 0.0138 | 497.6 | 1.8876 | 0.0124 | 495.7 | 1.8762 | 130 |
| 135 | 0.0160 | 505.3 | 1.9139 | 0.0150 | 504.40 | 1.9078 | 0.0141 | 503.5 | 1.9020 | 0.0126 | 501.6 | 1.8908 | 135 |
| 140 | 0.0163 | 511.1 | 1.9279 | 0.0153 | 510.20 | 1.9219 | 0.0144 | 509.3 | 1.9162 | 0.0129 | 507.5 | 1.9052 | 140 |
| 145 | 0.0166 | 516.8 | 1.9417 | 0.0156 | 516.00 | 1.9359 | 0.0147 | 515.2 | 1.9302 | 0.0132 | 513.4 | 1.9195 | 145 |
| 150 | 0.0169 | 522.6 | 1.9555 | 0.0159 | 521.81 | 1.9497 | 0.0150 | 521.0 | 1.9441 | 0.0134 | 519.3 | 1.9335 | 150 |
| 155 | 0.0172 | 528.4 | 1.9691 | 0.0161 | 527.64 | 1.9634 | 0.0152 | 526.9 | 1.9579 | 0.0137 | 525.3 | 1.9475 | 155 |
| 160 | 0.0174 | 534.2 | 1.9826 | 0.0164 | 533.48 | 1.9770 | 0.0155 | 532.7 | 1.9715 | 0.0139 | 531.2 | 1.9612 | 160 |
| 165 | 0.0177 | 540.1 | 1.9960 | 0.0167 | 539.34 | 1.9904 | 0.0158 | 538.6 | 1.9850 | 0.0142 | 537.1 | 1.9749 | 165 |
| 170 | 0.0180 | 545.9 | 2.0093 | 0.0170 | 545.21 | 2.0037 | 0.0160 | 544.5 | 1.9984 | 0.0144 | 543.1 | 1.9884 | 170 |
| 175 | 0.0183 | 551.8 | 2.0224 | 0.0172 | 551.11 | 2.0170 | 0.0163 | 550.4 | 2.0117 | 0.0147 | 549.1 | 2.0018 | 175 |

Table 2 (continued)
DuPont™ ISCEON® MO49 (R-413A) 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 | 2400 | | | 2600 | | | 2800 | | | 3000 | | | TEMP. °C |
| | (72.46°C) | | | (76.12°C) | | | (79.57°C) | | | (82.81°C) | | | |
| | V | H | S | V | H | S | V | H | S | V | H | S | |
| | (0.0070) | (416.5) | (1.6581) | (0.0063) | (416.3) | (1.6536) | (0.0056) | (415.6) | (1.6483) | (0.0050) | (414.5) | (1.642) | |
| 80 | 0.0078 | 429.0 | 1.6939 | 0.0067 | 423.6 | 1.6744 | 0.0057 | 416.6 | 1.6511 | — | — | — | 80 |
| 85 | 0.0083 | 436.4 | 1.7146 | 0.0072 | 431.9 | 1.6976 | 0.0062 | 426.5 | 1.6790 | — | — | — | 85 |
| 90 | 0.0086 | 443.4 | 1.7339 | 0.0076 | 439.4 | 1.7186 | 0.0067 | 435.0 | 1.7024 | 0.0058 | 429.8 | 1.6848 | 90 |
| 95 | 0.0090 | 450.1 | 1.7522 | 0.0080 | 446.5 | 1.7381 | 0.0071 | 442.7 | 1.7235 | 0.0063 | 438.4 | 1.7082 | 95 |
| 100 | 0.0094 | 456.6 | 1.7697 | 0.0083 | 453.4 | 1.7565 | 0.0074 | 449.9 | 1.7431 | 0.0066 | 446.2 | 1.7293 | 100 |
| 105 | 0.0097 | 462.9 | 1.7867 | 0.0086 | 460.0 | 1.7741 | 0.0078 | 456.9 | 1.7616 | 0.0070 | 453.6 | 1.7489 | 105 |
| 110 | 0.0100 | 469.2 | 1.8032 | 0.0090 | 466.5 | 1.7912 | 0.0081 | 463.6 | 1.7793 | 0.0073 | 460.6 | 1.7674 | 110 |
| 115 | 0.0103 | 475.4 | 1.8192 | 0.0092 | 472.9 | 1.8077 | 0.0084 | 470.2 | 1.7964 | 0.0076 | 467.5 | 1.7852 | 115 |
| 120 | 0.0106 | 481.5 | 1.8349 | 0.0095 | 479.1 | 1.8238 | 0.0086 | 476.7 | 1.8129 | 0.0078 | 474.1 | 1.8022 | 120 |
| 125 | 0.0108 | 487.6 | 1.8503 | 0.0098 | 485.4 | 1.8395 | 0.0089 | 483.1 | 1.8291 | 0.0081 | 480.7 | 1.8188 | 125 |
| 130 | 0.0111 | 493.6 | 1.8654 | 0.0101 | 491.5 | 1.8549 | 0.0091 | 489.4 | 1.8448 | 0.0084 | 487.1 | 1.8349 | 130 |
| 135 | 0.0114 | 499.7 | 1.8802 | 0.0103 | 497.7 | 1.8700 | 0.0094 | 495.6 | 1.8602 | 0.0086 | 493.5 | 1.8506 | 135 |
| 140 | 0.0116 | 505.7 | 1.8948 | 0.0106 | 503.8 | 1.8849 | 0.0096 | 501.8 | 1.8753 | 0.0088 | 499.8 | 1.8661 | 140 |
| 145 | 0.0119 | 511.7 | 1.9093 | 0.0108 | 509.9 | 1.8996 | 0.0099 | 508.0 | 1.8902 | 0.0091 | 506.1 | 1.8812 | 145 |
| 150 | 0.0121 | 517.7 | 1.9235 | 0.0110 | 515.9 | 1.9140 | 0.0101 | 514.2 | 1.9048 | 0.0093 | 512.4 | 1.8960 | 150 |
| 155 | 0.0124 | 523.7 | 1.9376 | 0.0113 | 522.0 | 1.9282 | 0.0103 | 520.3 | 1.9193 | 0.0095 | 518.6 | 1.9107 | 155 |
| 160 | 0.0126 | 529.6 | 1.9515 | 0.0115 | 528.1 | 1.9423 | 0.0105 | 526.5 | 1.9335 | 0.0097 | 524.8 | 1.9251 | 160 |
| 165 | 0.0128 | 535.6 | 1.9653 | 0.0117 | 534.1 | 1.9562 | 0.0107 | 532.6 | 1.9476 | 0.0099 | 531.0 | 1.9393 | 165 |
| 170 | 0.0131 | 541.7 | 1.9789 | 0.0119 | 540.2 | 1.9700 | 0.0110 | 538.7 | 1.9615 | 0.0101 | 537.2 | 1.9534 | 170 |
| 175 | 0.0133 | 547.7 | 1.9924 | 0.0121 | 546.3 | 1.9836 | 0.0112 | 544.8 | 1.9753 | 0.0103 | 543.4 | 1.9672 | 175 |

| ABSOLUTE PRESSURE, kPa | | | | | | | | | | | | | |
|------------------------|-----------|---------|----------|-----------|---------|----------|---|---|---|----|----|----|-------------|
| TEMP. °C | 3200 | | | 3400 | | | | | | | | | TEMP. °C |
| | (85.88°C) | | | (88.78°C) | | | | | | () | | | |
| | V | H | S | V | H | S | V | H | S | V | H | S | |
| | (0.0033) | (395.0) | (1.5668) | (0.0039) | (386.6) | (1.5524) | | | | () | () | () | |
| 95 | 0.0035 | 395.0 | 1.5767 | — | — | — | | | | | | | 95 |
| 100 | 0.0042 | 407.5 | 1.6105 | 0.0034 | 399.7 | 1.5876 | | | | | | | 100 |
| 105 | 0.0046 | 416.7 | 1.6350 | 0.0040 | 411.5 | 1.6189 | | | | | | | 105 |
| 110 | 0.0049 | 424.7 | 1.6560 | 0.0044 | 420.5 | 1.6427 | | | | | | | 110 |
| 115 | 0.0052 | 432.0 | 1.6751 | 0.0047 | 428.5 | 1.6635 | | | | | | | 115 |
| 120 | 0.0055 | 439.0 | 1.6929 | 0.0050 | 435.9 | 1.6824 | | | | | | | 120 |
| 125 | 0.0057 | 445.7 | 1.7098 | 0.0052 | 442.9 | 1.7001 | | | | | | | 125 |
| 130 | 0.0060 | 452.2 | 1.7259 | 0.0055 | 449.6 | 1.7169 | | | | | | | 130 |
| 135 | 0.0062 | 458.5 | 1.7415 | 0.0057 | 456.2 | 1.7330 | | | | | | | 135 |
| 140 | 0.0064 | 464.7 | 1.7567 | 0.0059 | 462.6 | 1.7485 | | | | | | | 140 |
| 145 | 0.0066 | 470.8 | 1.7714 | 0.0061 | 468.8 | 1.7636 | | | | | | | 145 |
| 150 | 0.0068 | 476.9 | 1.7858 | 0.0063 | 475.0 | 1.7783 | | | | | | | 150 |
| 155 | 0.0070 | 482.9 | 1.8000 | 0.0065 | 481.1 | 1.7927 | | | | | | | 155 |
| 160 | 0.0072 | 488.9 | 1.8138 | 0.0066 | 487.2 | 1.8068 | | | | | | | 160 |
| 165 | 0.0073 | 494.8 | 1.8274 | 0.0068 | 493.2 | 1.8206 | | | | | | | 165 |
| 170 | 0.0075 | 500.7 | 1.8409 | 0.0070 | 499.2 | 1.8342 | | | | | | | 170 |
| 175 | 0.0077 | 506.6 | 1.8541 | 0.0071 | 505.2 | 1.8476 | | | | | | | 175 |
| 180 | 0.0079 | 512.5 | 1.8671 | 0.0073 | 511.1 | 1.8607 | | | | | | | 180 |
| 185 | 0.0080 | 518.4 | 1.8800 | 0.0075 | 517.0 | 1.8738 | | | | | | | 185 |



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