

| T   | P     | V liquid            | V gas              | H liquid | H gas   | R      | S liquid | S gas   |
|-----|-------|---------------------|--------------------|----------|---------|--------|----------|---------|
| °C  | Bar   | dm <sup>3</sup> /kg | m <sup>3</sup> /kg | kJ/kg    | kJ/kg   | kJ/kg  | kJ/kg/K  | kJ/kg/K |
| -54 | 0,522 | 0,6899              | 0,39456            | 940,87   | 1182,02 | 241,15 | 0,7607   | 1,8611  |
| -53 | 0,551 | 0,6912              | 0,37548            | 941,9    | 1182,5  | 240,6  | 0,7654   | 1,8583  |
| -52 | 0,58  | 0,6925              | 0,3575             | 942,92   | 1182,98 | 240,05 | 0,77     | 1,8555  |
| -51 | 0,611 | 0,6939              | 0,34054            | 943,95   | 1183,45 | 239,5  | 0,7746   | 1,8528  |
| -50 | 0,644 | 0,6952              | 0,32456            | 944,98   | 1183,93 | 238,95 | 0,7793   | 1,8501  |
| -49 | 0,678 | 0,6966              | 0,30946            | 946,02   | 1184,4  | 238,39 | 0,7839   | 1,8474  |
| -48 | 0,713 | 0,698               | 0,29521            | 947,05   | 1184,88 | 237,83 | 0,7885   | 1,8448  |
| -47 | 0,749 | 0,6994              | 0,28175            | 948,09   | 1185,35 | 237,26 | 0,7931   | 1,8422  |
| -46 | 0,787 | 0,7008              | 0,26903            | 949,13   | 1185,82 | 236,69 | 0,7977   | 1,8397  |
| -45 | 0,827 | 0,7022              | 0,25699            | 950,18   | 1186,29 | 236,11 | 0,8022   | 1,8371  |
| -44 | 0,868 | 0,7036              | 0,2456             | 951,22   | 1186,76 | 235,54 | 0,8068   | 1,8347  |
| -43 | 0,911 | 0,705               | 0,23481            | 952,27   | 1187,23 | 234,95 | 0,8114   | 1,8322  |
| -42 | 0,955 | 0,7064              | 0,2246             | 953,32   | 1187,69 | 234,37 | 0,8159   | 1,8298  |
| -41 | 1,002 | 0,7079              | 0,21492            | 954,38   | 1188,16 | 233,78 | 0,8204   | 1,8274  |
| -40 | 1,049 | 0,7093              | 0,20574            | 955,44   | 1188,62 | 233,18 | 0,825    | 1,8251  |
| -39 | 1,099 | 0,7108              | 0,19704            | 956,5    | 1189,08 | 232,58 | 0,8295   | 1,8228  |
| -38 | 1,151 | 0,7123              | 0,18878            | 957,56   | 1189,54 | 231,98 | 0,834    | 1,8205  |
| -37 | 1,204 | 0,7138              | 0,18093            | 958,63   | 1190    | 231,37 | 0,8385   | 1,8183  |
| -36 | 1,259 | 0,7153              | 0,17348            | 959,69   | 1190,45 | 230,76 | 0,843    | 1,8161  |
| -35 | 1,317 | 0,7168              | 0,1664             | 960,77   | 1190,9  | 230,14 | 0,8475   | 1,8139  |
| -34 | 1,376 | 0,7183              | 0,15967            | 961,84   | 1191,36 | 229,52 | 0,852    | 1,8117  |
| -33 | 1,438 | 0,7198              | 0,15326            | 962,92   | 1191,81 | 228,89 | 0,8565   | 1,8096  |
| -32 | 1,501 | 0,7214              | 0,14717            | 964      | 1192,26 | 228,26 | 0,8609   | 1,8075  |
| -31 | 1,567 | 0,7229              | 0,14137            | 965,08   | 1192,7  | 227,62 | 0,8654   | 1,8054  |
| -30 | 1,635 | 0,7245              | 0,13584            | 966,16   | 1193,15 | 226,98 | 0,8698   | 1,8034  |
| -29 | 1,705 | 0,7261              | 0,13058            | 967,25   | 1193,59 | 226,34 | 0,8743   | 1,8013  |
| -28 | 1,778 | 0,7277              | 0,12556            | 968,34   | 1194,03 | 225,69 | 0,8787   | 1,7993  |
| -27 | 1,853 | 0,7293              | 0,12078            | 969,44   | 1194,47 | 225,03 | 0,8832   | 1,7974  |
| -26 | 1,93  | 0,7309              | 0,11621            | 970,53   | 1194,9  | 224,37 | 0,8876   | 1,7954  |
| -25 | 2,01  | 0,7325              | 0,11186            | 971,63   | 1195,34 | 223,71 | 0,892    | 1,7935  |
| -24 | 2,092 | 0,7342              | 0,1077             | 972,73   | 1195,77 | 223,04 | 0,8964   | 1,7916  |
| -23 | 2,177 | 0,7358              | 0,10373            | 973,84   | 1196,2  | 222,36 | 0,9008   | 1,7897  |
| -22 | 2,265 | 0,7375              | 0,09993            | 974,94   | 1196,63 | 221,68 | 0,9052   | 1,7879  |
| -21 | 2,355 | 0,7392              | 0,09631            | 976,06   | 1197,05 | 221    | 0,9096   | 1,786   |
| -20 | 2,448 | 0,7409              | 0,09284            | 977,17   | 1197,48 | 220,31 | 0,9139   | 1,7842  |
| -19 | 2,544 | 0,7426              | 0,08952            | 978,28   | 1197,9  | 219,61 | 0,9183   | 1,7824  |
| -18 | 2,643 | 0,7443              | 0,08635            | 979,4    | 1198,31 | 218,91 | 0,9227   | 1,7807  |
| -17 | 2,745 | 0,7461              | 0,08332            | 980,52   | 1198,73 | 218,2  | 0,927    | 1,7789  |
| -16 | 2,849 | 0,7478              | 0,08041            | 981,65   | 1199,14 | 217,49 | 0,9314   | 1,7772  |
| -15 | 2,957 | 0,7496              | 0,07762            | 982,78   | 1199,55 | 216,78 | 0,9357   | 1,7755  |
| -14 | 3,068 | 0,7514              | 0,07495            | 983,91   | 1199,96 | 216,05 | 0,9401   | 1,7738  |
| -13 | 3,182 | 0,7532              | 0,0724             | 985,04   | 1200,37 | 215,33 | 0,9444   | 1,7721  |
| -12 | 3,299 | 0,755               | 0,06994            | 986,17   | 1200,77 | 214,59 | 0,9487   | 1,7704  |
| -11 | 3,419 | 0,7569              | 0,06759            | 987,31   | 1201,17 | 213,85 | 0,953    | 1,7688  |
| -10 | 3,543 | 0,7587              | 0,06534            | 988,46   | 1201,56 | 213,11 | 0,9574   | 1,7672  |
| -9  | 3,67  | 0,7606              | 0,06317            | 989,6    | 1201,96 | 212,36 | 0,9617   | 1,7656  |
| -8  | 3,801 | 0,7625              | 0,06109            | 990,75   | 1202,35 | 211,6  | 0,966    | 1,764   |
| -7  | 3,935 | 0,7644              | 0,0591             | 991,9    | 1202,74 | 210,84 | 0,9702   | 1,7624  |
| -6  | 4,072 | 0,7663              | 0,05718            | 993,05   | 1203,12 | 210,07 | 0,9745   | 1,7609  |
| -5  | 4,213 | 0,7683              | 0,05534            | 994,21   | 1203,5  | 209,3  | 0,9788   | 1,7593  |
| -4  | 4,358 | 0,7703              | 0,05356            | 995,37   | 1203,88 | 208,52 | 0,9831   | 1,7578  |
| -3  | 4,507 | 0,7722              | 0,05186            | 996,53   | 1204,26 | 207,73 | 0,9873   | 1,7563  |
| -2  | 4,659 | 0,7742              | 0,05022            | 997,69   | 1204,63 | 206,94 | 0,9916   | 1,7548  |
| -1  | 4,816 | 0,7763              | 0,04865            | 998,86   | 1205    | 206,14 | 0,9959   | 1,7533  |
| 0   | 4,976 | 0,7783              | 0,04713            | 1000,03  | 1205,37 | 205,34 | 1,0001   | 1,7519  |
| 1   | 5,14  | 0,7804              | 0,04567            | 1001,21  | 1205,73 | 204,53 | 1,0044   | 1,7504  |
| 2   | 5,308 | 0,7825              | 0,04427            | 1002,38  | 1206,09 | 203,71 | 1,0086   | 1,7489  |
| 3   | 5,481 | 0,7846              | 0,04291            | 1003,56  | 1206,45 | 202,88 | 1,0128   | 1,7475  |
| 4   | 5,657 | 0,7867              | 0,04161            | 1004,75  | 1206,8  | 202,05 | 1,0171   | 1,7461  |
| 5   | 5,838 | 0,7889              | 0,04035            | 1005,93  | 1207,15 | 201,22 | 1,0213   | 1,7447  |
| 6   | 6,023 | 0,791               | 0,03914            | 1007,12  | 1207,5  | 200,37 | 1,0255   | 1,7433  |
| 7   | 6,212 | 0,7932              | 0,03797            | 1008,32  | 1207,84 | 199,52 | 1,0297   | 1,7419  |
| 8   | 6,406 | 0,7955              | 0,03685            | 1009,51  | 1208,18 | 198,66 | 1,0339   | 1,7405  |
| 9   | 6,604 | 0,7977              | 0,03576            | 1010,71  | 1208,51 | 197,8  | 1,0381   | 1,7392  |
| 10  | 6,807 | 0,8                 | 0,03471            | 1011,92  | 1208,84 | 196,93 | 1,0423   | 1,7378  |
| 11  | 7,014 | 0,8023              | 0,0337             | 1013,12  | 1209,17 | 196,05 | 1,0465   | 1,7365  |
| 12  | 7,226 | 0,8046              | 0,03272            | 1014,33  | 1209,49 | 195,16 | 1,0507   | 1,7351  |
| 13  | 7,443 | 0,807               | 0,03178            | 1015,52  | 1209,81 | 194,29 | 1,0548   | 1,7338  |
| 14  | 7,665 | 0,8094              | 0,03087            | 1016,74  | 1210,13 | 193,39 | 1,059    | 1,7325  |
| 15  | 7,891 | 0,8118              | 0,02999            | 1017,95  | 1210,44 | 192,48 | 1,0632   | 1,7312  |
| 16  | 8,123 | 0,8142              | 0,02914            | 1019,18  | 1210,75 | 191,57 | 1,0673   | 1,7298  |
| 17  | 8,359 | 0,8167              | 0,02831            | 1020,4   | 1211,05 | 190,64 | 1,0715   | 1,7285  |
| 18  | 8,601 | 0,8192              | 0,02752            | 1021,63  | 1211,35 | 189,71 | 1,0757   | 1,7273  |
| 19  | 8,847 | 0,8217              | 0,02675            | 1022,86  | 1211,64 | 188,77 | 1,0798   | 1,726   |
| 20  | 9,099 | 0,8243              | 0,026              | 1024,1   | 1211,93 | 187,83 | 1,084    | 1,7247  |

|    |        |        |         |         |         |        |        |        |
|----|--------|--------|---------|---------|---------|--------|--------|--------|
| 21 | 9,356  | 0,8269 | 0,02528 | 1025,34 | 1212,21 | 186,87 | 1,0881 | 1,7234 |
| 22 | 9,619  | 0,8295 | 0,02459 | 1026,59 | 1212,49 | 185,9  | 1,0923 | 1,7221 |
| 23 | 9,887  | 0,8322 | 0,02391 | 1027,83 | 1212,76 | 184,93 | 1,0964 | 1,7209 |
| 24 | 10,16  | 0,8349 | 0,02326 | 1029,08 | 1213,03 | 183,95 | 1,1006 | 1,7196 |
| 25 | 10,439 | 0,8376 | 0,02262 | 1030,34 | 1213,3  | 182,96 | 1,1047 | 1,7183 |
| 26 | 10,723 | 0,8404 | 0,02201 | 1031,6  | 1213,56 | 181,96 | 1,1088 | 1,7171 |
| 27 | 11,014 | 0,8432 | 0,02142 | 1032,86 | 1213,81 | 180,95 | 1,113  | 1,7158 |
| 28 | 11,309 | 0,8461 | 0,02084 | 1034,13 | 1214,06 | 179,93 | 1,1171 | 1,7146 |
| 29 | 11,611 | 0,849  | 0,02028 | 1035,4  | 1214,3  | 178,9  | 1,1212 | 1,7133 |
| 30 | 11,919 | 0,8519 | 0,01974 | 1036,68 | 1214,54 | 177,86 | 1,1254 | 1,7121 |
| 31 | 12,232 | 0,8549 | 0,01922 | 1037,96 | 1214,77 | 176,81 | 1,1295 | 1,7108 |
| 32 | 12,552 | 0,8579 | 0,01871 | 1039,25 | 1215    | 175,75 | 1,1336 | 1,7096 |
| 33 | 12,878 | 0,861  | 0,01821 | 1040,54 | 1215,22 | 174,68 | 1,1377 | 1,7083 |
| 34 | 13,21  | 0,8641 | 0,01773 | 1041,83 | 1215,43 | 173,6  | 1,1419 | 1,7071 |
| 35 | 13,548 | 0,8673 | 0,01727 | 1043,13 | 1215,64 | 172,51 | 1,146  | 1,7058 |
| 36 | 13,892 | 0,8705 | 0,01682 | 1044,43 | 1215,84 | 171,4  | 1,1501 | 1,7046 |
| 37 | 14,243 | 0,8738 | 0,01638 | 1045,74 | 1216,03 | 170,29 | 1,1543 | 1,7033 |
| 38 | 14,601 | 0,8771 | 0,01595 | 1047,06 | 1216,22 | 169,16 | 1,1584 | 1,7021 |
| 39 | 14,965 | 0,8805 | 0,01554 | 1048,38 | 1216,4  | 168,02 | 1,1625 | 1,7008 |
| 40 | 15,335 | 0,8839 | 0,01514 | 1049,7  | 1216,57 | 166,87 | 1,1667 | 1,6995 |
| 41 | 15,712 | 0,8874 | 0,01474 | 1051,03 | 1216,74 | 165,7  | 1,1708 | 1,6983 |
| 42 | 16,097 | 0,8909 | 0,01436 | 1052,37 | 1216,89 | 164,52 | 1,1749 | 1,697  |
| 43 | 16,487 | 0,8946 | 0,01399 | 1053,71 | 1217,04 | 163,33 | 1,1791 | 1,6957 |
| 44 | 16,885 | 0,8983 | 0,01363 | 1055,06 | 1217,18 | 162,13 | 1,1832 | 1,6944 |
| 45 | 17,29  | 0,902  | 0,01328 | 1056,41 | 1217,32 | 160,91 | 1,1874 | 1,6931 |
| 46 | 17,702 | 0,9058 | 0,01294 | 1057,77 | 1217,44 | 159,67 | 1,1915 | 1,6918 |
| 47 | 18,121 | 0,9097 | 0,01261 | 1059,14 | 1217,56 | 158,42 | 1,1957 | 1,6905 |
| 48 | 18,548 | 0,9137 | 0,01229 | 1060,51 | 1217,66 | 157,15 | 1,1998 | 1,6892 |
| 49 | 18,982 | 0,9178 | 0,01198 | 1061,89 | 1217,76 | 155,87 | 1,204  | 1,6878 |
| 50 | 19,423 | 0,9219 | 0,01167 | 1063,28 | 1217,85 | 154,57 | 1,2082 | 1,6865 |
| 51 | 19,872 | 0,9261 | 0,01137 | 1064,67 | 1217,93 | 153,25 | 1,2124 | 1,6851 |
| 52 | 20,328 | 0,9304 | 0,01108 | 1066,08 | 1217,99 | 151,92 | 1,2165 | 1,6838 |
| 53 | 20,793 | 0,9349 | 0,0108  | 1067,49 | 1218,05 | 150,56 | 1,2207 | 1,6824 |
| 54 | 21,265 | 0,9394 | 0,01052 | 1068,91 | 1218,09 | 149,19 | 1,2249 | 1,681  |
| 55 | 21,744 | 0,944  | 0,01025 | 1070,33 | 1218,13 | 147,79 | 1,2292 | 1,6795 |
| 56 | 22,232 | 0,9487 | 0,00999 | 1071,77 | 1218,15 | 146,38 | 1,2334 | 1,6781 |
| 57 | 22,728 | 0,9535 | 0,00973 | 1073,21 | 1218,15 | 144,94 | 1,2376 | 1,6767 |
| 58 | 23,232 | 0,9585 | 0,00948 | 1074,67 | 1218,15 | 143,48 | 1,2419 | 1,6752 |
| 59 | 23,745 | 0,9635 | 0,00924 | 1076,13 | 1218,13 | 142    | 1,2462 | 1,6737 |
| 60 | 24,266 | 0,9687 | 0,009   | 1077,61 | 1218,1  | 140,49 | 1,2504 | 1,6721 |
| 61 | 24,795 | 0,9741 | 0,00877 | 1079,09 | 1218,05 | 138,96 | 1,2547 | 1,6706 |
| 62 | 25,333 | 0,9796 | 0,00854 | 1080,59 | 1217,99 | 137,4  | 1,2591 | 1,669  |
| 63 | 25,879 | 0,9852 | 0,00832 | 1082,1  | 1217,91 | 135,81 | 1,2634 | 1,6674 |
| 64 | 26,435 | 0,991  | 0,0081  | 1083,62 | 1217,81 | 134,19 | 1,2677 | 1,6658 |
| 65 | 26,999 | 0,997  | 0,00789 | 1085,16 | 1217,7  | 132,54 | 1,2721 | 1,6641 |
| 66 | 27,573 | 1,0031 | 0,00768 | 1086,7  | 1217,56 | 130,86 | 1,2765 | 1,6624 |
| 67 | 28,155 | 1,0095 | 0,00748 | 1088,27 | 1217,41 | 129,14 | 1,281  | 1,6606 |
| 68 | 28,747 | 1,0161 | 0,00728 | 1089,85 | 1217,23 | 127,39 | 1,2854 | 1,6588 |
| 69 | 29,348 | 1,0228 | 0,00708 | 1091,44 | 1217,04 | 125,6  | 1,2899 | 1,657  |
| 70 | 29,959 | 1,0298 | 0,00689 | 1093,05 | 1216,82 | 123,77 | 1,2944 | 1,6551 |
| 71 | 30,579 | 1,0371 | 0,0067  | 1094,68 | 1216,57 | 121,89 | 1,299  | 1,6532 |
| 72 | 31,21  | 1,0446 | 0,00652 | 1096,33 | 1216,3  | 119,97 | 1,3036 | 1,6512 |
| 73 | 31,85  | 1,0525 | 0,00634 | 1098    | 1216    | 118    | 1,3082 | 1,6491 |
| 74 | 32,5   | 1,0606 | 0,00616 | 1099,71 | 1215,67 | 115,96 | 1,3129 | 1,647  |
| 75 | 33,161 | 1,0691 | 0,00598 | 1101,42 | 1215,31 | 113,89 | 1,3177 | 1,6448 |
| 76 | 33,832 | 1,078  | 0,00581 | 1103,15 | 1214,91 | 111,76 | 1,3224 | 1,6425 |
| 77 | 34,513 | 1,0873 | 0,00564 | 1104,91 | 1214,48 | 109,57 | 1,3273 | 1,6402 |
| 78 | 35,205 | 1,097  | 0,00548 | 1106,73 | 1214    | 107,27 | 1,3322 | 1,6377 |
| 79 | 35,909 | 1,1073 | 0,00531 | 1108,56 | 1213,48 | 104,91 | 1,3372 | 1,6351 |
| 80 | 36,623 | 1,1181 | 0,00515 | 1110,44 | 1212,91 | 102,47 | 1,3423 | 1,6325 |
| 81 | 37,348 | 1,1295 | 0,00499 | 1112,35 | 1212,28 | 99,93  | 1,3475 | 1,6297 |
| 82 | 38,086 | 1,1416 | 0,00483 | 1114,31 | 1211,6  | 97,29  | 1,3528 | 1,6267 |
| 83 | 38,834 | 1,1545 | 0,00467 | 1116,32 | 1210,85 | 94,53  | 1,3582 | 1,6236 |
| 84 | 39,595 | 1,1684 | 0,00451 | 1118,38 | 1210,02 | 91,64  | 1,3637 | 1,6203 |
| 85 | 40,368 | 1,1832 | 0,00436 | 1120,52 | 1209,11 | 88,6   | 1,3694 | 1,6168 |
| 86 | 41,154 | 1,1994 | 0,0042  | 1122,72 | 1208,1  | 85,38  | 1,3753 | 1,613  |
| 87 | 41,952 | 1,217  | 0,00405 | 1125,02 | 1206,98 | 81,96  | 1,3814 | 1,609  |
| 88 | 42,763 | 1,2363 | 0,00389 | 1127,42 | 1205,72 | 78,3   | 1,3878 | 1,6046 |
| 89 | 43,587 | 1,2579 | 0,00373 | 1129,94 | 1204,3  | 74,36  | 1,3945 | 1,5998 |
| 90 | 44,425 | 1,2823 | 0,00357 | 1132,62 | 1202,67 | 70,06  | 1,4016 | 1,5945 |
| 91 | 45,277 | 1,3103 | 0,0034  | 1135,51 | 1200,77 | 65,26  | 1,4092 | 1,5884 |
| 92 | 46,144 | 1,3436 | 0,00322 | 1138,66 | 1198,52 | 59,85  | 1,4176 | 1,5815 |
| 93 | 47,025 | 1,3845 | 0,00303 | 1142,21 | 1195,75 | 53,54  | 1,4269 | 1,5732 |
| 94 | 47,922 | 1,4384 | 0,00282 | 1146,36 | 1192,13 | 45,77  | 1,4379 | 1,5626 |
| 95 | 48,835 | 1,5206 | 0,00255 | 1151,78 | 1186,72 | 34,94  | 1,4523 | 1,5472 |
| 96 | 49,774 | 1,906  | 0,00191 | 1167,98 | 1167,98 | 0      | 1,4958 | 1,4958 |