CHAPTER 2

THE THERMODYNAMIC PROPERTIES OF AIR

In spite of the important role of air as an atmosphere and as a technical gas, there are surprisingly few direct determinations of the thermodynamic properties of air. Such charts [1-6] as have been published on air have been limited in the range of temperature or pressure or both. Although convenient tables are available for air as an ideal gas [7, 8], no published tables are available which contain a complete consistent collection of values of the thermodynamic properties of air treated as a real gas over a range of temperatures and pressures demanded in present-day research and development.

The thermodynamic properties of air are tabulated here from 100° to 3000°K in the pressure range 0.01 to 100 atmospheres. This range can be divided into two distinct regions. In the region below 1500°K, the composition of the air was considered fixed and the corrections for gas imperfection are significant. Here the experimental data of state and other pertinent data are required for an adequate representation. Above 1500°K, in this pressure range, the corrections for gas imperfection are small and the predominant influence on the thermodynamic properties is the degree to which the constituents of air have become dissociated. In this region, the properties of air are based on the contributions from each of the molecular and atomic species present in the equilibrium composition at each temperature and pressure.

Below 1500°K,the tables were computed from the virial equation of state. In this region, the composition was taken as follows: 0.7809 N_2, 0.2095 O_2, 0.0093 A, 0.0003 CO_2 moles per mole of air, yielding an average molecular weight of 28.966. In the region of dissociation, the tables for air are based on the tables of equilibrium composition for air given by Hirschfelder and Curtiss [9], who tabulated compositions and skeletal thermodynamic tables for air to 5000°K. The decision to terminate the present tables at 2300°K at pressures below 0.1 atmosphere and at 3000°K for higher pressures was dictated by the uncertainty in the energy of dissociation of nitrogen, which rendered the above-mentioned tables of compositions doubtful above 3000°K.

The Correlation of the Experimental Data

The pressure-volume-temperature relations for air were investigated in the late nineteenth century by Amagat [10] and Witkowski [11]; in the early twentieth century by Koch [12], Holborn and Schultze [13], Holborn and Otto [14], and Penning [15]; and in modern times by Michels, et al., [16, 17, 34], and Kiyama [18]. The data of Holborn and Otto [14], corrected in the manner suggested by Cragoe [19], were correlated with the existing Joule-Thomson data to form the basis for these tables. The more recent data [16, 17, 18] became available after the tables were computed and were not included in the fitting. A comparison of some of the experimental data with the present tabulation is given in figure 2a.

The data of state were represented by a virial equation in density employing second, third, and fourth virial coefficients. The second and third virials were obtained for the Lennard-Jones 6-12 potential function by a modification of a procedure outlined by Woolley [20]. The fourth virial coefficients, which were found to have only a small influence in the tabulated region, were estimated from a curve given in reference 21. The virial coefficients are given in table 2-12. Since the tables were desired in terms of a pressure rather than a density argument, an iterative process was resorted to by means of which, at each tabulated temperature and pressure, trial values of ρ and Z were used successively until the values converged upon the desired pressure with the desired accuracy.

A comparison of the Joule-Thomson data--and, in fact, of all the experimental data--for air was made by Din in connection with the preparation, for the British Mechanical Engineering Research Laboratory, of a new thermodynamic diagram for air [22]. This unpublished work, like the present correlation, uses Joule-Thomson data to compensate for the lack of PVT data at higher pressures. The data of Roebuck [23, 24] were found to be more consistent with the data of state than were the results of Hausen [25]. This fact is also illustrated in figure 2c where the specific heats derived from expansion experiments of Hausen and of Roebuck are compared with the values resulting from this correlation.

During the course of the correlation, values for the derived properties such as specific heat, sound velocity at low frequency, etc., were computed and checked against the existing experimental data for these properties. Comparisons were made with experimental specific-heat measurements of Dailey and Felsing [26], Eucken and V. Lüde [27], and Kistiakowsky and Rice [28]; the sound velocity measurements of Hodge [29] and of Van Itterbeek and Van Doninck [30]; the isothermal porous-plug experiments of Eucken, Clusius, and Berger [31]; and the calorimetric measurements of the enthalpy-pressure coefficient by Andersen [32] and the energy-pressure coefficients by Rossini and Frandsen [33].

The dimensionless representation has been accomplished for certain properties by expressing them relative to the value at standard conditions (0°C and 1 atmosphere). Thus, for density, the property is expressed as ρ/ρ_0, for sound velocity as a/a_0, for thermal conductivity as k/k_0, and for viscosity as η/η_0. The reference values, ρ_0, a_0, k_0, and η_0, result, in general, from the correlating equations which were fitted to represent the experimental data over as wide a range as possible. Values for these quantities are given in various units in table 2-b. The values of ρ_0 and k_0 are in close agreement with the experimental data as shown in figures 2a and 2f. The value of η_0 is the average of values reported in 20 separate investigations [43-48, 55-68]. The value of 331.45 m/sec for a_0 is in close agreement with the precise direct determinations of 331.41 by Hebb [69] and 331.60 ± 0.05 by Kneser [70].

The Reliability of the Tables

The effects of dissociation are included in the tables for air above 1500° where this effect becomes significant. They are applicable only when the air has been at an elevated temperature long enough to achieve chemical equilibrium. Although such equilibrium is achieved in many processes, it may not be reached in certain dynamic situations such as occur in shock waves, etc. The present tables are consistent in the low temperature region with the recent calculations

of Hall and Ibele [35, 36], which did not include the effects of dissociation. If the properties for air for the fixed composition (without dissociation) are desired, the tables of Hall and Ibele should be consulted.

Above 2000°K, the tables for the compressibility factor should be reliable to 0.0003 up to 10 atmospheres and to 0.002 up to 100 atmospheres. Above 500°K, the tabulated values depend largely on theoretical calculations; it is believed that the uncertainty of any entry does not exceed 20 percent in (Z-1). The departure of the experimental data from the tables is illustrated in figure 2a. Corresponding uncertainties and corrections apply to the table of densities (table 2-2). The data of Michels and co-workers [16, 17, 34] became available after the tables had been computed. The agreement, however, is very good except at the low temperatures where the new data may be used to modify the tabulated values in accordance with the deviations shown in figure 2a. Above 200°K, the tables agree also with those calculated from the Beattie-Bridgeman equation [37] and with those of Claitor and Crawford [6].

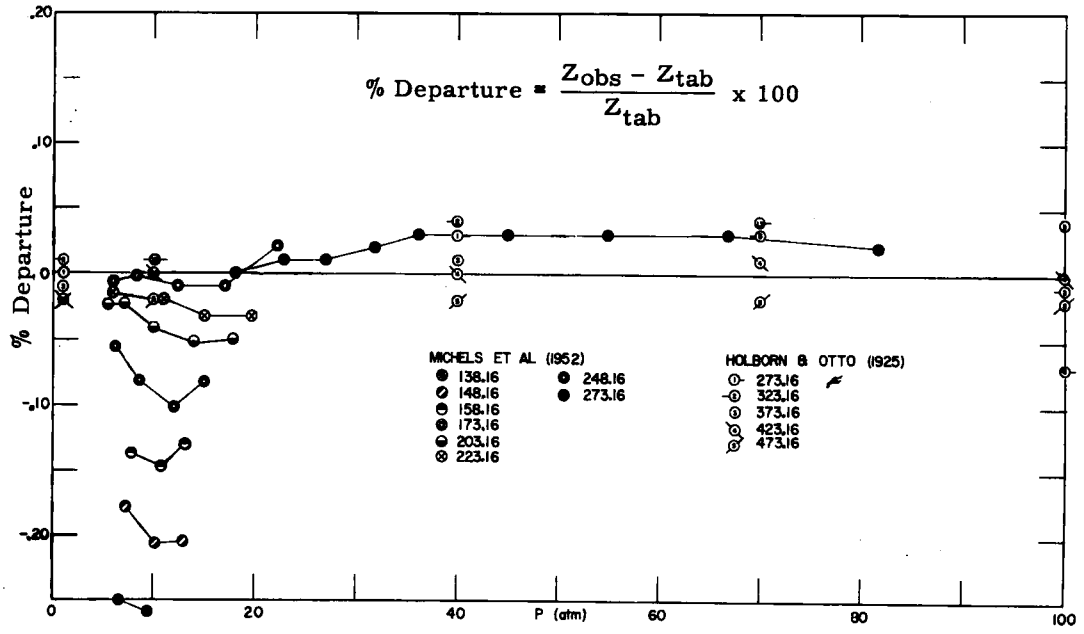

Figure 2a. Departures of experimental compressibility factors from the tabulated values for air (table 2-1)

In the case of specific heat (table 2-3) for the temperature range 100 - 300°K at all pressures except the highest entry and for the temperature range 300 - 800°K at all pressures, the uncertainty does not exceed 20 percent in $C_p - C_p^o$. For the highest pressure entries at temperatures below 300°K, the uncertainty may approach 30 percent in $C_p - C_p^o$. Direct measurements of C_p are few; figures 2b and 2c present a comparison of the tabulated values with existing data, either measured directly or derived, through assumptions for the equation of state, from the thermal measurements cited.

The values contained in the tables of enthalpy (table 2-4) and entropy (table 2-5) have been rounded so that the uncertainty probably does not exceed two or three parts in the last place tabulated, except at the extremes--low temperature and high pressure, or vice versa--where it may reach two parts in the next to last place. Similarly, the uncertainty in the specific-heat ratios (table 2-6) does not exceed two or three parts in the last place tabulated except at the extremes where it may reach two parts in the next to last place.

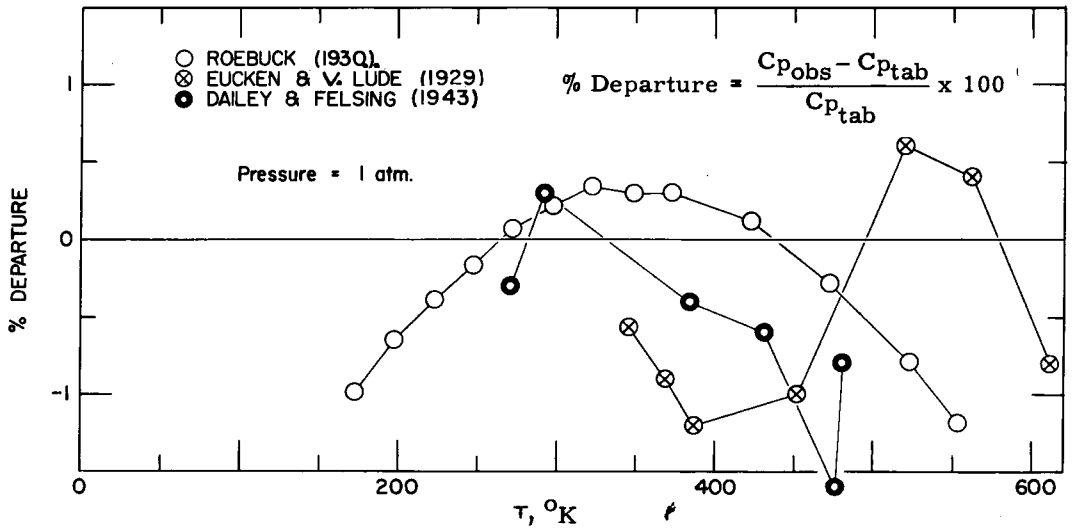

Figure 2b. Departures of low-pressure experimental specific heats from the tabulated values for air (table 2-3)

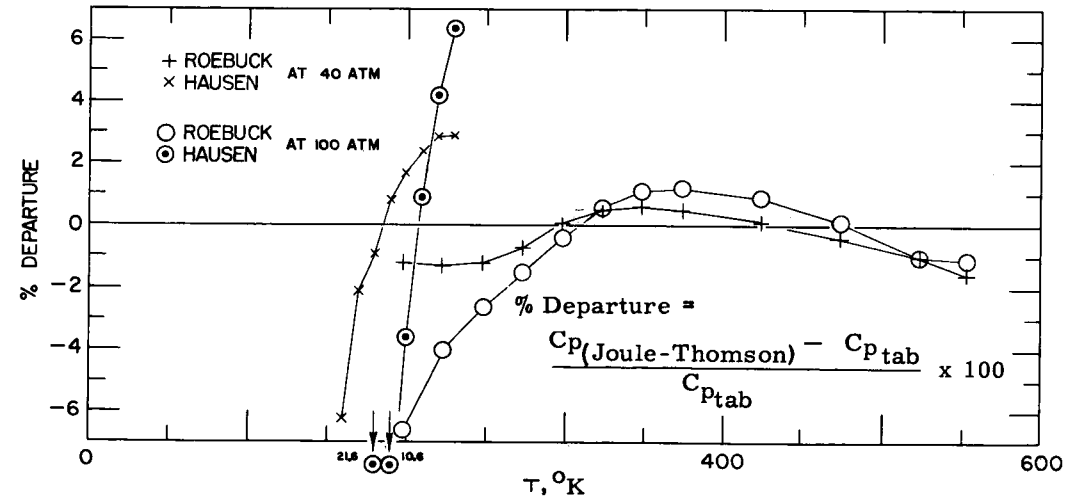

Figure 2c. Departures of specific heats (calculated from Joule-Thomson data) from the tabulated values for air (table 2-3)

The uncertainty in the sound velocity at low frequency (table 2-7) can be expressed in terms of the effect of the gas imperfection. Thus, in the temperature range from 100-270°K at all pressures except the highest entry and in the temperature range 270-800°K at all pressures, the error in $(a/a_0) - (a^o/a_0)_{.01\ atm}$ should not exceed 3 percent; the high-pressure entries below 270°K may be in error by 10 percent in that quantity. A comparison with the experimental results of Hodge [29] is given in figure 2d. The departures are within his estimated experimental uncertainty of 0.2 percent. At higher temperatures, the results are purely theoretical and should be accurate to 0.1 percent if the assumption of equilibrium composition is valid. Such accuracy, however, is unlikely since equilibrium is probably not attained and chemical dispersion effects undoubtedly occur (in the region of changing composition). Physical dispersion effects may also give rise to considerable differences between experimental and tabulated results, especially at high values of frequency/pressure. The tabulated values will, in all such cases, be a lower limit to the actual velocity.

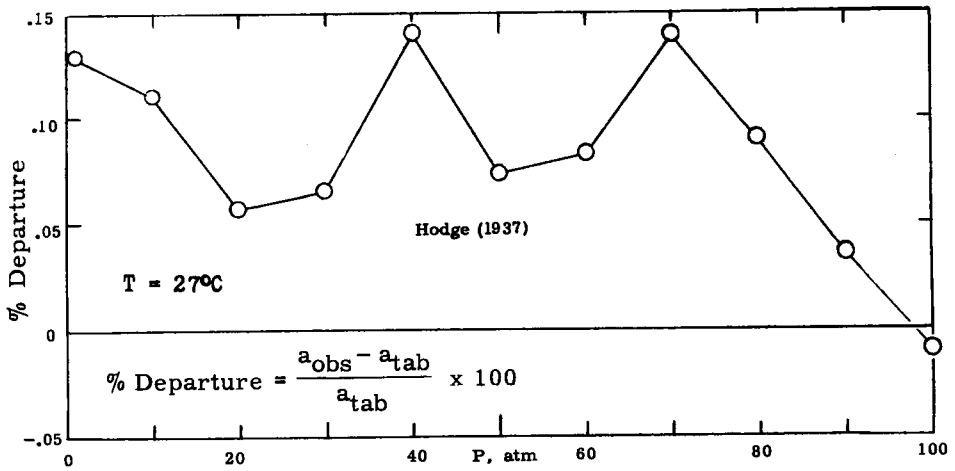

Figure 2d. Departures of experimental sound velocities at 27°C from the tabulated values for air (table 2-7)

The values of viscosity (table 2-8) and the thermal conductivity (table 2-9) were computed from the empirical equations given in summary tables 1-B and 1-C. These equations are based on the existing experimental data upon which the present tabulations depend for their reliability. The departures of the experimental data from the tabulated values are given in figures 2e and 2f from which the reliability of the viscosities can be assessed as being within 2 percent and the thermal conductivity within 4 percent.

The Prandtl number, $N_{Pr} = \eta\ C_p/k$, and certain of its fractional powers are listed (table 2-10) for dry air at 1 atmosphere. The nomogram in figure 2g will facilitate the calculations of other fractional powers not tabulated.

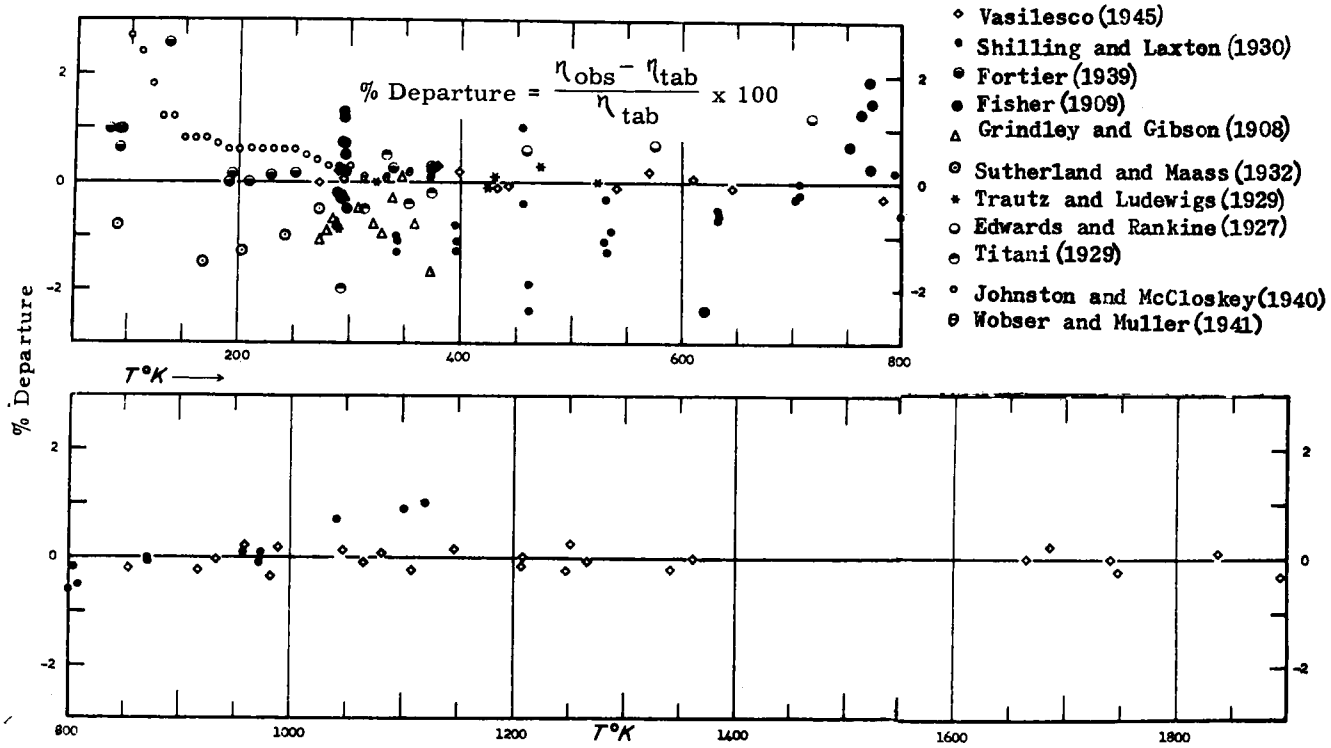

Figure 2e. Departure of experimental viscosity data from the tabulated values for air (table 2-8)

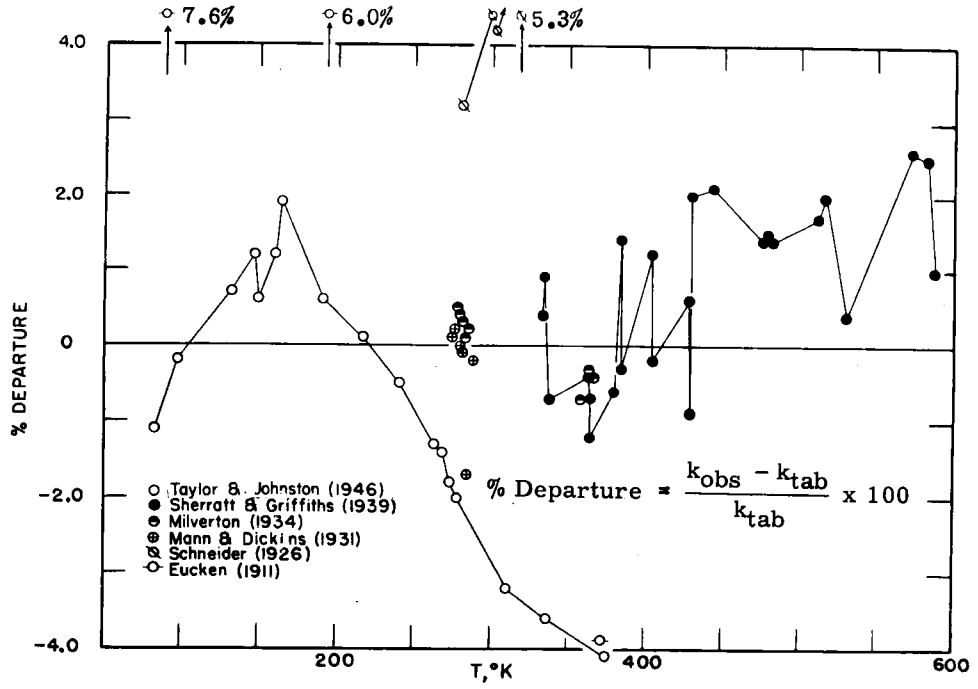

Figure 2f. Departures of low-pressure experimental thermal conductivities from the tabulated values for air (table 2-9)

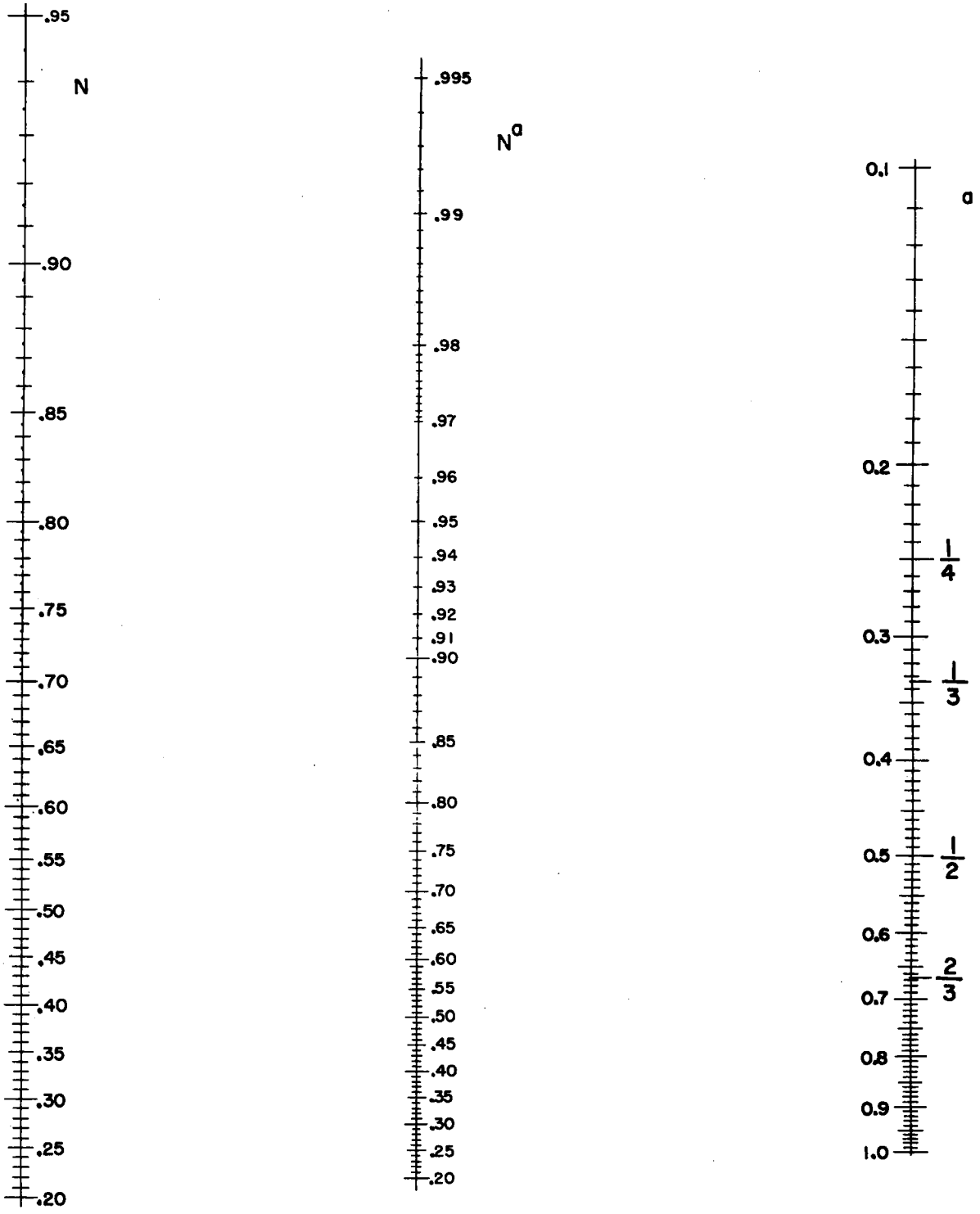

Figure 2g. Nomogram for the calculation of fractional powers of the Prandtl number

References

[1] A. Seligman, Z. ges. Kälte-Ind. 29, 77 (1922); 31, 129 (1924).

[2] H. Hausen, Forsch. Gebiete Ingenieurw., No. 274, (1926).

[3] R. V. Gerhart, F. C. Brunner, H. S. Mickley, B. H. Sage, and W. N. Lacey, Mech. Eng. 64, 270 (1942).

[4] V. C. Williams, Trans. Am. Inst. Chem. Engrs. 39, 93 (1943).

[5] J. H. Rushton, Refrig. Eng. 53, 24 (1947).

[6] L. C. Claitor and D. B. Crawford, Trans. Am. Soc. Mech. Engrs. 71, 885 (1949).

[7] J. H. Keenan and J. Kaye, Gas tables (John Wiley and Sons, Inc., New York, N.Y., 1948).

[8] V. N. Huff, S. Gordon, and V. E. Morrell, Natl. Advisory Comm. Aeronaut. Rept. 1037 (1951).

[9] J. O. Hirschfelder and C. F. Curtiss, Dept. of Chem., Univ. Wisconsin (Naval Research Lab.) Report CM-518, (1948).

[10] E. H. Amagat, Ann. chim. et phys. [6] 29, 68 (1893).

[11] A. W. Witkowski, Phil. Mag. [5] 41, 288 (1896); [5] 42, 1 (1896).

[12] P. P. Koch, Ann. Physik [4] 27, 311 (1908).

[13] L. Holborn and H. Schultze, Ann. Physik [4] 47, 1089 (1915).

[14] L. Holborn and J. Otto, Z. Physik 33, 1 (1925).

[15] F. M. Penning, Communs. Phys. Lab. Univ. Leiden, No. 166, (1923).

[16] A. Michels, T. Wassenaar, and Th. N. Zwietering, Physica 18, 67 (1952).

[17] T. Wassenaar, Dissertation, Amsterdam (1952).

[18] R. Kiyama, Rev. Phys. Chem. Japan 19, 38 (1945).

[19] C. S. Cragoe, in Am. Inst. Phys., Temperature, its measurement and control in science and industry, p. 97 (Reinhold Publishing Corp., New York, N.Y., 1941).

[20] H. W. Woolley, J. Chem. Phys. 21, 236 (1953).

[21] R. B. Bird, E. L. Spotz, and J. O. Hirschfelder, J. Chem. Phys. 18, 1395 (1950).

[22] F. Din, private communication.

[23] J. R. Roebuck, Proc. Am. Acad. Arts Sci. 60, 537 (1925).

[24] J. R. Roebuck, Proc. Am. Acad. Arts Sci. 64, 287 (1930).

[25] H. Hausen, Z. tech. Phys. 7, 371 and 444 (1926).

[26] B. P. Dailey and W. A. Felsing, J. Am. Chem. Soc. 65, 42 (1943).

[27] A. Eucken and K. Von Lüde, Z. physik. Chem. [B] 5, 413 (1929).

[28] C. B. Kistiakowsky and W. W. Rice, J. Chem. Phys. 7, 281 (1939).

[29] A. H. Hodge, J. Chem. Phys. 5, 974 (1937).

[30] A. Van Itterbeek and W. Van Doninck, Ann. phys. [11] 19, 88 (1944).

[31] A. Eucken, K. Clusius, and W. Berger, Z. tech. Phys. 13, 267 (1932).

[32] J. R. Andersen, Trans. Am. Soc. Mech. Engrs. 72, 759 (1950).

[33] F. D. Rossini and M. Frandsen, Bur. Standards J. Research 9, 733 (1932) RP503.

[34] A. Michels, T. Wassenaar, and W. van Seventer, Appl. Sci. Research [A] 4, 52 (1954).

[35] N. A. Hall and W. E. Ibele, Univ. Minn. Inst. Technol. Eng. Exp. Sta. Tech. Paper No. 85 (1951).

[36] N. A. Hall and W. E. Ibele, Trans. Am. Soc. Mech. Engrs. 76, 1039 (1954).

[37] J. A. Beattie, Phys. Rev. [2] 35, 643 (1930).

[38] V. Vasilesco, Ann. phys. [11] 20, 292 (1945).

[39] W. G. Shilling and A. E. Laxton, Phil. Mag. [7] 10, 721 (1930).

[40] A. Fortier, Compt. rend. 203, 711 (1936); 208, 506 (1939).

[41] W. J. Fisher, Phys. Rev. [1] 28, 73 (1909).

[42] J. H. Grindley and A. H. Gibson, Proc. Roy. Soc. (London) [A] 80, 114 (1908).

[43] B. P. Sutherland and O. Maass, Can. J. Research 6, 428 (1932).

[44] M. Trautz and W. Ludewigs, Ann. Physik [5] 3, 409 (1929).

[45] R. S. Edwards and A. O. Rankine, Proc. Roy. Soc. (London) [A] 117, 245 (1927).

[46] T. Titani, Bull. Chem. Soc. Japan 4, 68 (1929).

[47] H. L. Johnston and K. E. McCloskey, J. Phys. Chem. 44, 1038 (1940).

[48] R. Wobser and F. Müller, Kolloid-Beih. 52, 165 (1941).

[49] W. J. Taylor and H. L. Johnston, J. Chem. Phys. 14, 219 (1946).

[50] G. G. Sherratt and E. Griffiths, Phil. Mag. [7] 27, 68 (1939).

[51] S. W. Milverton, Phil. Mag. [7] 17, 397 (1934).

[52] W. B. Mann and B. G. Dickins, Proc. Roy. Soc. (London) [A] 134, 77 (1931).

[53] E. Schneider, Ann. Physik [4] 79, 177 (1926).

[54] A. Eucken, Physik. Z. 12, 1101 (1911).

[55] G. Kellstrom, Arkiv. Mat. Astron. Fysik [A] 27, 1 (1941).

[56] I. M. Rapp, Phys. Rev. [2] 2, 363 (1913).

[57] W. N. Bond, Nature 137, 1031 (1936).

[58] V. D. Majumdar and M. B. Vajifdar, Proc. Indian Acad. Sci. [A] 8, 171 (1938).

[59] J. A. Bearden, Phys. Rev. [2] 56, 1023 (1939).

[60] G. B. Banerjea and B. Plattanaik, Z. Physik 110, 676 (1938).

[61] H. Vogel, Ann. Physik. [4] 43, 1235 (1914).

[62] J. P. Rigden, Phil. Mag. [7] 25, 961 (1938).

[63] W. V. Houston, Phys. Rev. [2] 52, 751 (1937).

[64] E. L. Harrington, Phys. Rev. [2] 55, 230 (1939).

[65] K. S. Van Dyke, Phys. Rev. [2] 21, 250 (1923).

[66] L. Gilchrist, Phys. Rev. [2] 1, 124 (1913).

[67] A. Gille, Ann. Physik. [4] 48, 799 (1915).

[68] J. L. Hogg, Proc. Am. Acad. Arts Sci. 40, 609 (1905).

[69] T. C. Hebb, Phys. Rev. [2] 14, 74 (1919).

[70] H. O. Kneser, Ann. Physik [5] 34, 665 (1939).

345970 O - 55 - 3

Table 2-a. VALUES OF THE GAS CONSTANT, R, FOR AIR.

Values of R for Air for Temperatures in Degrees Kelvin

Pressure / Density	atm	kg/cm^2	mm Hg	lb/in^2
g/cm^3	2.83286	2.92699	2152.97	41.6317
$mole/cm^3$	82.0567	84.7832	62363.1	1205.91
mole/liter	0.0820544	0.0847809	62.3613	1.20587
lb/ft^3	0.0453777	0.0468855	34.4871	0.666871
lb $mole/ft^3$	1.31441	1.35808	998.952	19.3166

Values of R for Air for Temperatures in Degrees Rankine

Pressure / Density	atm	kg/cm^2	mm Hg	lb/in^2
g/cm^3	1.57381	1.62611	1196.09	23.1287
$mole/cm^3$	45.5871	47.1018	34646.2	669.947
mole/liter	0.0455858	0.0471005	34.6452	0.669928
lb/ft^3	0.0252098	0.0260475	19.1595	0.370484
lb $mole/ft^3$	0.730228	0.754489	554.973	10.7314

Table 2-b. CONVERSION FACTORS FOR THE AIR TABLES

Conversion Factors for Table 2-2

To Convert Tabulated Value of	To	Having the Dimensions Indicated Below	Multiply by
ρ/ρ_0	ρ	g cm^{-3}	1.29304×10^{-3}
		mole cm^{-3}	4.46400×10^{-5}
		g $liter^{-1}$	1.29308
		lb in^{-3}	4.67143×10^{-5}
		lb ft^{-3}	8.07223×10^{-2}

Conversion Factors for Tables 2-4 and 2-11

To Convert Tabulated Value of	To	Having the Dimensions Indicated Below	Multiply by
$(H^o - E_0^o)/RT_0$,	$(H^o - E_0^o)$,	cal $mole^{-1}$	542.821
$(H - E_0^o)/RT_0$	$(H - E_0^o)$	cal g^{-1}	18.7399
		joules g^{-1}	78.4079
		Btu $(lb\ mole)^{-1}$	976.437
		Btu lb^{-1}	33.7098

Conversion Factors for Tables 2-3, 2-5, and 2-11

To Convert Tabulated Value of	To	Having the Dimensions Indicated Below	Multiply by
C_p^o/R, S^o/R,	C_p^o, S^o,	cal $mole^{-1}\ {}^oK^{-1}$ (or $^oC^{-1}$)	1.98719
C_p/R, S/R	C_p, S	cal $g^{-1}\ {}^oK^{-1}$ (or $^oC^{-1}$)	0.0686042
		joules $g^{-1}\ {}^oK^{-1}$ (or $^oC^{-1}$)	0.287041
		Btu $(lb\ mole)^{-1}\ {}^oR^{-1}$ (or $^oF^{-1}$)	1.98588
		Btu $lb^{-1}\ {}^oR^{-1}$ (or $^oF^{-1}$)	0.0685590

The molecular weight of air is 28.966 g $mole^{-1}$. Unless otherwise specified the mole is the gram-mole; the calorie is the thermochemical calorie; and the joule is the absolute joule.

Table 2-b. CONVERSION FACTORS FOR THE AIR TABLES - Cont.

Conversion Factors for Table 2-7

To Convert Tabulated Value of	To	Having the Dimensions Indicated Below	Multiply by
a_0	a	$m\ sec^{-1}$	331.45
		$ft\ sec^{-1}$	1087.4

Conversion Factors for Table 2-8

To Convert Tabulated Value of	To	Having the Dimensions Indicated Below	Multiply by
η/η_0	η	poise or $g\ sec^{-1}\ cm^{-1}$	1.716×10^{-4}
		$kg\ hr^{-1}\ m^{-1}$	6.178×10^{-2}
		$slug\ hr^{-1}\ ft^{-1}$	1.290×10^{-3}
		$lb\ sec^{-1}\ ft^{-1}$	1.153×10^{-5}
		$lb\ hr^{-1}\ ft^{-1}$	4.151×10^{-2}

Conversion Factors for Table 2-9

To Convert Tabulated Value of	To	Having the Dimensions Indicated Below	Multiply by
k/k_0	k	$cal\ cm^{-1}\ sec^{-1}\ {}^{o}K^{-1}$	5.770×10^{-5}
		$Btu\ ft^{-1}\ hr^{-1}\ {}^{o}R^{-1}$	1.395×10^{-2}
		$watts\ cm^{-1}\ {}^{o}K^{-1}$	2.414×10^{-4}

Table 2-1. COMPRESSIBILITY FACTOR FOR AIR $Z = PV/RT$

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
50	.99871	52							90
60	.99923	27							108
70	.99950	16							126
80	.99966	9	.99657	94					144
90	.99975	6	.99751	62	.98992	256	.98220	452	162
100	.99981	5	.99813	43	.99248	175	.98672	313	180
110	.99986	3	.99856	31	.99423	125	.98985	221	198
120	.99989	2	.99887	23	.99548	92	.99206	162	216
130	.99991	2	.99910	18	.99640	69	.99368	122	234
140	.99993	1	.99928	13	.99709	54	.99490	95	252
150	.99994	1	.99941	10	.99763	42	.99585	74	270
160	.99995		.99951	9	.99805	34	.99659	59	288
170	.99995	1	.99960	7	.99839	27	.99718	48	306
180	.99996	1	.99967	5	.99866	22	.99766	39	324
190	.99997	1	.99972	5	.99888	19	.99805	32	342
200	.99998		.99977	3	.99907	15	.99837	26	360
210	.99998		.99980	4	.99922	13	.99863	23	378
220	.99998	1	.99984	2	.99935	10	.99886	19	396
230	.99999		.99986	3	.99945	9	.99905	16	414
240	.99999		.99989	2	.99954	8	.99921	13	432
250	.99999		.99991	1	.99962	7	.99934	12	450
260	.99999		.99992	2	.99969	6	.99946	10	468
270	.99999	1	.99994	1	.99975	5	.99956	9	486
280	1.00000		.99995	1	.99980	4	.99965	7	504
290	1.00000		.99996	1	.99984	4	.99972	7	522
300	1.00000		.99997	1	.99988	3	.99979	6	540
310	1.00000		.99998	1	.99991	3	.99985	5	558
320	1.00000		.99999		.99994	3	.99990	4	576
330	1.00000		.99999	1	.99997	2	.99994	4	594
340	1.00000		1.00000		.99999	2	.99998	3	612
350	1.00000		1.00000	1	1.00001	2	1.00001	3	630
360	1.00000		1.00001		1.00003	1	1.00004	3	648
370	1.00000		1.00001		1.00004	1	1.00007	3	666
380	1.00000		1.00001	1	1.00005	2	1.00010	2	684
390	1.00000		1.00002		1.00007	1	1.00012	2	702
400	1.00000		1.00002		1.00008	1	1.00014	1	720
410	1.00000		1.00002		1.00009	1	1.00015	2	738
420	1.00000		1.00002	1	1.00010		1.00017	1	756
430	1.00000		1.00003		1.00010	1	1.00018	1	774
440	1.00000		1.00003		1.00011	1	1.00019	1	792
450	1.00000		1.00003		1.00012		1.00020	1	810
460	1.00000		1.00003		1.00012	1	1.00021	1	828
470	1.00000		1.00003		1.00013		1.00022		846
480	1.00000		1.00003		1.00013		1.00022	1	864
490	1.00000		1.00003		1.00013	1	1.00023	1	882
500	1.00000		1.00003		1.00014		1.00024		900
510	1.00000		1.00003		1.00014		1.00024	1	918
520	1.00000		1.00003		1.00014		1.00025		936
530	1.00000		1.00003	1	1.00014	1	1.00025	1	954
540	1.00000		1.00004		1.00015		1.00026		972
550	1.00000		1.00004		1.00015		1.00026		990
560	1.00000		1.00004		1.00015		1.00026		1008
570	1.00000		1.00004		1.00015		1.00026	1	1026
580	1.00000		1.00004		1.00015		1.00027		1044
590	1.00000		1.00004		1.00015		1.00027		1062
600	1.00000		1.00004		1.00015		1.00027		1080
610	1.00000		1.00004		1.00015		1.00027		1098
620	1.00000		1.00004		1.00015		1.00027		1116
630	1.00000		1.00004		1.00015		1.00027		1134
640	1.00000		1.00004		1.00015		1.00027		1152
650	1.00000		1.00004		1.00015		1.00027		1170

Table 2-1. COMPRESSIBILITY FACTOR FOR AIR - Cont.

Z = PV/RT

°K	.01 atm	.1 atm	.4 atm	.7 atm	°R
650	1.00000	1.00004	1.00015	1.00027	1170
660	1.00000	1.00004	1.00015	1.00027	1188
670	1.00000	1.00004	1.00015	1.00027	1206
680	1.00000	1.00004	1.00015	1.00027	1224
690	1.00000	1.00004	1.00015	1.00027	1242
700	1.00000	1.00004	1.00015	1.00027	1260
710	1.00000	1.00004	1.00015	1.00027	1278
720	1.00000	1.00004	1.00015	1.00027	1296
730	1.00000	1.00004	1.00015	1.00027	1314
740	1.00000	1.00004	1.00015	1.00027 - 1	1332
750	1.00000	1.00004	1.00015	1.00026	1350
760	1.00000	1.00004	1.00015	1.00026	1368
770	1.00000	1.00004	1.00015	1.00026	1386
780	1.00000	1.00004	1.00015	1.00026	1404
790	1.00000	1.00004	1.00015	1.00026	1422
800	1.00000	1.00004	1.00015 - 1	1.00026 - 1	1440
850	1.00000	1.00004	1.00014	1.00025	1530
900	1.00000	1.00004 - 1	1.00014	1.00025 - 1	1620
950	1.00000	1.00003	1.00014 - 1	1.00024 - 1	1710
1000	1.00000	1.00003	1.00013 - 1	1.00023	1800
1050	1.00000	1.00003	1.00012	1.00023 - 1	1890
1100	1.00000	1.00003	1.00012 - 1	1.00022 - 1	1980
1150	1.00000	1.00003	1.00011	1.00021	2070
1200	1.00000	1.00003	1.00011	1.00021 - 1	2160
1250	1.00000	1.00003	1.00011	1.00020 - 1	2250
1300	1.00000	1.00003	1.00011 - 1	1.00019	2340
1350	1.00000	1.00003	1.00010	1.00019 - 1	2430
1400	1.00000	1.00003	1.00010	1.00018	2520
1450	1.00000 1	1.00003	1.00010	1.00018	2610
1500	1.00001 2	1.00003 1	1.00010	1.00018 - 1	2700
1550	1.00003 2	1.00004	1.00010	1.00017	2790
1600	1.00005 3	1.00004 1	1.00010	1.00017	2880
1650	1.00008 3	1.00005 1	1.00010 1	1.00017	2970
1700	1.00011 5	1.00006 1	1.00011	1.00017	3060
1750	1.00016 9	1.00007 3	1.00011 2	1.00017 2	3150
1800	1.00025 16	1.00010 4	1.00013 2	1.00019 1	3240
1850	1.00041 27	1.00014 9	1.00015 4	1.00020 3	3330
1900	1.00068 41	1.00023 14	1.00019 6	1.00023 4	3420
1950	1.00109 58	1.00037 17	1.00025 9	1.00027 6	3510
2000	1.00167 75	1.00054 23	1.00034 13	1.00033 11	3600
2050	1.00242 100	1.00077 34	1.00047 18	1.00044 14	3690
2100	1 00342 133	1.00111 45	1.00065 21	1.00058 14	3780
2150	1.00475 178	1.00156 59	1.00086 27	1.00072 19	3870
2200	1.00653 236	1.00215 68	1.00113 35	1.00091 28	3960
2250	1.00889 307	1.00283 88	1.00148 46	1.00119 36	4050
2300	1.01196	1.00371 123	1.00194 61	1.00155 47	4140
2350		1.00494 160	1.00255 80	1.00202 59	4230
2400		1.00654 193	1.00335 96	1.00261 72	4320
2450		1.00847 232	1.00431 117	1.00333 89	4410
2500		1.01079 278	1.00548 141	1.00422 108	4500
2550		1.01357 336	1.00689 172	1.00530 131	4590
2600		1.01693 404	1.00861 208	1.00661 160	4680
2650		1.02097 475	1.01069 244	1.00821 187	4770
2700		1.02572 546	1.01313 277	1.01008 212	4860
2750		1.03118 623	1.01590 320	1.01220 248	4950
2800		1.03741 703	1.01910 370	1.01468 288	5040
2850		1.04444 784	1.02280 422	1.01756 333	5130
2900		1.05228 858	1.02702 467	1.02089 387	5220
2950		1.06086 921	1.03169 549	1.02476 444	5310
3000		1.07007	1.03718	1.02920	5400

Table 2-1. COMPRESSIBILITY FACTOR FOR AIR - Cont. $Z = PV/RT$

°K	1 atm		4 atm		7 atm		10 atm		°R
100	.98090	452							180
110	.98542	319	.93853	1415	.8855	281	.8234	469	198
120	.98861	234	.95268	1009	.9136	194	.8703	307	216
130	.99095	176	.96277	745	.9330	137	.9010	211	234
140	.99271	136	.97022	569	.9467	105	.9221	157	252
150	.99407	106	.97591	439	.95716	798	.9378	118	270
160	.99513	84	.98030	348	.96514	623	.9496	92	288
170	.99597	69	.98378	278	.97137	499	.95880	727	306
180	.99666	55	.98656	226	.97636	403	.96607	584	324
190	.99721	46	.98882	185	.98039	328	.97191	475	342
200	.99767	39	.99067	154	.98367	267	.97666	392	360
210	.99806	31	.99221	126	.98634	223	.98058	325	378
220	.99837	27	.99347	107	.98857	188	.98383	273	396
230	.99864	22	.99454	92	.99045	160	.98656	230	414
240	.99886	20	.99546	78	.99205	147	.98886	196	432
250	.99906	17	.99624	66	.99352	117	.99082	167	450
260	.99923	14	.99690	58	.99469	101	.99249	144	468
270	.99937	12	.99748	50	.99570	86	.99393	123	486
280	.99949	11	.99798	43	.99656	76	.99516	107	504
290	.99960	10	.99841	38	.99732	65	.99623	94	522
295	.99965		.99860		.99766		.99670		
300	.99970	8	.99879	33	.99797	58	.99717	81	540
310	.99978	7	.99912	28	.99855	50	.99798	71	558
320	.99985	6	.99940	26	.99905	44	.99869	63	576
330	.99991	6	.99966	23	.99949	38	.99932	55	594
340	.99997	5	.99989	19	.99987	34	.99987	48	612
350	1.00002	4	1.00008	17	1.00021	30	1.00035	43	630
360	1.00006	4	1.00025	16	1.00051	27	1.00078	37	648
370	1.00010	4	1.00041	14	1.00078	24	1.00115	34	666
380	1.00014	3	1.00055	14	1.00102	20	1.00149	29	684
390	1.00017	2	1.00069	10	1.00122	19	1.00178	27	702
400	1.00019	3	1.00079	10	1.00141	16	1.00205	23	720
410	1.00022	2	1.00089	8	1.00157	15	1.00228	20	738
420	1.00024	2	1.00097	8	1.00172	13	1.00248	19	756
430	1.00026	1	1.00105	6	1.00185	11	1.00267	16	774
440	1.00027	2	1.00111	5	1.00196	11	1.00283	14	792
450	1.00029	1	1.00116	5	1.00207	9	1.00297	13	810
460	1.00030	1	1.00121	5	1.00216	8	1.00310	11	828
470	1.00031	1	1.00126	4	1.00224	7	1.00321	10	846
480	1.00032	1	1.00130	4	1.00231	6	1.00331	9	864
490	1.00033	1	1.00134	3	1.00237	5	1.00340	8	882
500	1.00034	1	1.00137	3	1.00242	5	1.00348	7	900
510	1.00035		1.00140	2	1.00247	4	1.00355	6	918
520	1.00035	1	1.00142	2	1.00251	4	1.00361	5	936
530	1.00036	1	1.00144	2	1.00255	3	1.00366	4	954
540	1.00037		1.00146	2	1.00258	3	1.00370	4	972
550	1.00037		1.00148	2	1.00261	2	1.00374	3	990
560	1.00037	1	1.00150	1	1.00263	2	1.00377	3	1008
570	1.00038		1.00151	1	1.00265	1	1.00380	2	1026
580	1.00038		1.00152		1.00266	1	1.00382	2	1044
590	1.00038		1.00152		1.00267		1.00384	1	1062
600	1.00038		1.00152	1	1.00267		1.00385	1	1080
610	1.00038		1.00153		1.00267	1	1.00386	1	1098
620	1.00038		1.00153	1	1.00268		1.00387	1	1116
630	1.00038		1.00154		1.00268	1	1.00388		1134
640	1.00038		1.00154		1.00269		1.00388		1152
650	1.00038	1	1.00154		1.00269	1	1.00388		1170
660	1.00039		1.00154		1.00270		1.00388		1188
670	1.00039	- 1	1.00154	- 1	1.00270	- 1	1.00388	- 1	1206
680	1.00038		1.00153		1.00269		1.00387	- 1	1224
690	1.00038		1.00153		1.00269	- 1	1.00386	- 1	1242
700	1.00038		1.00153		1.00268		1.00385		1260

Table 2-1. COMPRESSIBILITY FACTOR FOR AIR - Cont. $Z = PV/RT$

°K	1 atm		4 atm		7 atm		10 atm		°R
700	1.00038		1.00153		1.00268		1.00385	- 1	1260
710	1.00038		1.00153	- 1	1.00268	- 1	1.00384	- 1	1278
720	1.00038		1.00152		1.00267	- 1	1.00383	- 1	1296
730	1.00038		1.00152		1.00266	- 1	1.00382	- 2	1314
740	1.00038		1.00152	- 1	1.00265	- 1	1.00380	- 1	1332
750	1.00038		1.00151		1.00264	- 1	1.00379	- 1	1350
760	1.00038		1.00151	- 1	1.00263	- 1	1.00378	- 2	1368
770	1.00038		1.00150	- 1	1.00262	- 1	1.00376	- 2	1386
780	1.00038		1.00149		1.00261	- 1	1.00374	- 1	1404
790	1.00038	- 1	1.00149	- 1	1.00260	- 1	1.00373	- 2	1422
800	1.00037	- 1	1.00148	- 4	1.00259	- 7	1.00371	- 10	1440
850	1.00036	- 1	1.00144	- 4	1.00252	- 6	1.00361	- 10	1530
900	1.00035	- 1	1.00140	- 4	1.00246	- 7	1.00351	- 10	1620
950	1.00034	- 1	1.00136	- 4	1.00239	- 8	1.00341	- 10	1710
1000	1.00033	- 1	1.00132	- 4	1.00231	- 6	1.00331	- 10	1800
1050	1.00032	- 1	1.00128	- 4	1.00225	- 7	1.00321	- 10	1890
1100	1.00031	- 1	1.00124	- 4	1.00218	- 7	1.00311	- 9	1980
1150	1.00030	- 1	1.00120	- 3	1.00211	- 6	1.00302	- 9	2070
1200	1.00029	- 1	1.00117	- 4	1.00205	- 6	1.00293	- 9	2160
1250	1.00028		1.00113	- 3	1.00199	- 6	1.00284	- 9	2250
1300	1.00028	- 1	1.00110	- 3	1.00193	- 6	1.00275	- 8	2340
1350	1.00027	- 1	1.00107	- 3	1.00187	- 5	1.00267	- 8	2430
1400	1.00026	- 1	1.00104	- 3	1.00182	- 6	1.00259	- 7	2520
1450	1.00025	- 1	1.00101	- 3	1.00176	- 5	1.00252	- 7	2610
1500	1.00024		1.00098	- 2	1.00171	- 4	1.00245	- 6	2700
1550	1.00024	- 1	1.00096	- 2	1.00167	- 4	1.00239	- 6	2790
1600	1.00023		1.00094	- 2	1.00163	- 3	1.00233	- 5	2880
1650	1.00023		1.00092	- 2	1.00160	- 3	1.00228	- 5	2970
1700	1.00023		1.00090	- 2	1.00157	- 3	1.00223	- 5	3060
1750	1.00023	1	1.00088	- 1	1.00154	- 2	1.00218	- 5	3150
1800	1.00024	1	1.00087	- 1	1.00152	- 3	1.00213	- 5	3240
1850	1.00025	2	1.00086	- 1	1.00149	- 3	1.00208	- 4	3330
1900	1.00027	3	1.00085		1.00146	- 3	1.00204	- 4	3420
1950	1.00030	5	1.00085		1.00143	- 3	1.00200	- 4	3510
2000	1.00035	1	1.00085		1.00140		1.00196	- 1	3600
2050	1.0005	1	1.0009	1	1.0014		1.0019		3690
2100	1.0006	1	1.0010		1.0014		1.0019		3780
2150	1.0007	1	1.0010		1.0014		1.0019		3870
2200	1.0008	3	1.0010	1	1.0014	1	1.0019		3960
2250	1.0011	3	1.0011	2	1.0015	1	1.0019	1	4050
2300	1.0014	4	1.0013	2	1.0016	2	1.0020	1	4140
2350	1.0018	5	1.0015	2	1.0018	1	1.0021	1	4230
2400	1.0023	6	1.0017	3	1.0019	2	1.0022	2	4320
2450	1.0029	7	1.0020	4	1.0021	3	1.0024	2	4410
2500	1.0036	9	1.0024	4	1.0024	3	1.0026	3	4500
2550	1.0045	11	1.0028	6	1.0027	4	1.0029	3	4590
2600	1.0056	14	1.0034	7	1.0031	5	1.0032	4	4680
2650	1.0070	16	1.0041	7	1.0036	6	1.0036	5	4770
2700	1.0086	18	1.0048	10	1.0042	7	1.0041	5	4860
2750	1.0104	20	1.0058	10	1.0049	8	1.0046	7	4950
2800	1.0124	25	1.0068	13	1.0057	11	1.0053	8	5040
2850	1.0149	29	1.0081	15	1.0068	11	1.0061	10	5130
2900	1.0178	34	1.0096	17	1.0079	13	1.0071	11	5220
2950	1.0212	40	1.0113	20	1.0092	15	1.0082	13	5310
3000	1.0252		1.0133		1.0107		1.0095		5400

Table 2-1. COMPRESSIBILITY FACTOR FOR AIR - Cont. $Z = PV/RT$

°K	10 atm		40 atm		70 atm		100 atm		°R
150	.9378	118	.6832	857					270
160	.9496	92	.7689	529					288
170	.95880	727	.8218	371					306
180	.96607	584	.8589	277	.7550	537	.6950	650	324
190	.97191	475	.8866	214	.8087	394	.7600	505	342
200	.97666	392	.9080	169	.8481	302	.8105	389	360
210	.98058	325	.9249	137	.8783	237	.8494	307	378
220	.98383	273	.9386	111	.9020	192	.8801	247	396
230	.98656	230	.9497	93	.9212	156	.9048	202	414
240	.98886	196	.9590	78	.9368	130	.9250	167	432
250	.99082	167	.96680	654	.9498	108	.9417	140	450
260	.99249	144	.97334	560	.9606	92	.9557	118	468
270	.99393	123	.97894	477	.9698	78	.9675	100	486
280	.99516	107	.98371	411	.9776	66	.9775	85	504
290	.99623 .99670	94	.98782 .98958	353	.9842	58	.9860	73	522
300	.99717	81	.99135	308	.9900	49	.9933	63	540
310	.99798	71	.99443	267	.9949	43	.9996	55	558
320	.99869	63	.99710	233	.9992	37	1.0051	48	576
330	.99932	55	.99943	207	1.0029	33	1.0099	41	594
340	.99987	48	1.00150	176	1.0062	28	1.0140	36	612
350	1.00035	43	1.00326	157	1.0090	25	1.0176	31	630
360	1.00078	37	1.00483	139	1.0115	22	1.0207	28	648
370	1.00115	34	1.00622	122	1.0137	19	1.0235	24	666
380	1.00149	29	1.00744	107	1.0156	17	1.0259	21	684
390	1.00178	27	1.00851	95	1.0173	15	1.0280	19	702
400	1.00205	23	1.00946	84	1.0188	13	1.0299	16	720
410	1.00228	20	1.01030	75	1.0201	11	1.0315	14	738
420	1.00248	19	1.01105	65	1.0212	10	1.0329	12	756
430	1.00267	16	1.01170	58	1.0222	9	1.0341	11	774
440	1.00283	14	1.01228	51	1.0231	8	1.0352	10	792
450	1.00297	13	1.01279	45	1.0239	7	1.0362	8	810
460	1.00310	11	1.01324	39	1.0246	6	1.0370	7	828
470	1.00321	10	1.01363	35	1.0252	5	1.0377	6	846
480	1.00331	9	1.01398	30	1.0257	4	1.0383	5	864
490	1.00340	8	1.01428	26	1.0261	4	1.0388	5	882
500	1.00348	7	1.01454	23	1.0265	3	1.0393	4	900
510	1.00355	6	1.01477	20	1.0268	3	1.0397	3	918
520	1.00361	5	1.01497	18	1.0271	3	1.0400	2	936
530	1.00366	4	1.01515	14	1.0274	2	1.0402	2	954
540	1.00370	4	1.01529	12	1.0276	1	1.0404	2	972
550	1.00374	3	1.01541	10	1.0277	2	1.0406	1	990
560	1.00377	3	1.01551	8	1.0279	1	1.0407	1	1008
570	1.00380	2	1.01559	6	1.0280	1	1.0408		1026
580	1.00382	2	1.01565	5	1.0281		1.0408		1044
590	1.00384	1	1.01570	4	1.0281		1.0408		1062
600	1.00385	1	1.01574	3	1.0281		1.0408		1080
610	1.00386	1	1.01577	1	1.0281		1.0408		1098
620	1.00387	1	1.01578		1.0281		1.0408	- 1	1116
630	1.00388		1.01578	- 1	1.0281	- 1	1.0407	- 1	1134
640	1.00388		1.01577	- 1	1.0280		1.0406	- 1	1152
650	1.00388		1.01576	- 3	1.0280	- 1	1.0405	- 1	1170
660	1.00388		1.01573	- 2	1.0279	- 1	1.0404	- 2	1188
670	1.00388	- 1	1.01571	- 4	1.0278	- 1	1.0402	- 2	1206
680	1.00387	- 1	1.01567	- 4	1.0277	- 1	1.0400	- 1	1224
690	1.00386	- 1	1.01563	- 5	1.0276	- 1	1.0399	- 2	1242
700	1.00385		1.01558		1.0275		1.0397		1260

Table 2-1. COMPRESSIBILITY FACTOR FOR AIR - Cont. $Z = PV/RT$

°K	10 atm		40 atm		70 atm		100 atm		°R
700	1.00385	- 1	1.01558	- 5	1.0275	- 1	1.0397	- 1	1260
710	1.00384	- 1	1.01553	- 6	1.0274	- 1	1.0396	- 2	1278
720	1.00383	- 1	1.01547	- 6	1.0273	- 1	1.0394	- 2	1296
730	1.00382	- 2	1.01541	- 6	1.0272	- 1	1.0392	- 1	1314
740	1.00380	- 1	1.01535	- 7	1.0271	- 1	1.0391	- 2	1332
750	1.00379	- 1	1.01528	- 7	1.0270	- 1	1.0389	- 2	1350
760	1.00378	- 2	1.01521	- 6	1.0269	- 2	1.0387	- 2	1368
770	1.00376	- 2	1.01515	- 7	1.0267	- 1	1.0385	- 2	1386
780	1.00374	- 1	1.01508	- 8	1.0266	- 1	1.0383	- 2	1404
790	1.00373	- 2	1.01500	- 7	1.0265	- 2	1.0381	- 2	1422
800	1.00371	- 10	1.01493	- 40	1.0263	- 7	1.0379	- 12	1440
850	1.00361	- 10	1.01453	- 42	1.0256	- 8	1.0367	- 11	1530
900	1.00351	- 10	1.01411	- 43	1.0248	- 8	1.0356	- 12	1620
950	1.00341	- 10	1.01368	- 43	1.0240	- 7	1.0344	- 11	1710
1000	1.00331	- 10	1.01325	- 40	1.0233	- 8	1.0333	- 11	1800
1050	1.00321	- 10	1.01285	- 40	1.0225	- 7	1.0322	- 10	1890
1100	1.00311	- 9	1.01245	- 38	1.0218	- 7	1.0312	- 10	1980
1150	1.00302	- 9	1.01207	- 37	1.0211	- 6	1.0302	- 10	2070
1200	1.00293	- 9	1.01170	- 36	1.0205	- 7	1.0292	- 9	2160
1250	1.00284	- 9	1.01134	- 34	1.0198	- 6	1.0283	- 8	2250
1300	1.00275	- 8	1.01100	- 32	1.0192	- 5	1.0275	- 8	2340
1350	1.00267	- 8	1.01068	- 31	1.0187	- 6	1.0267	- 8	2430
1400	1.00259	- 7	1.01037	- 30	1.0181	- 5	1.0259	- 8	2520
1450	1.00252	- 7	1.01007	- 29	1.0176	- 5	1.0251	- 7	2610
1500	1.00245	- 6	1.00978	- 3	1.0171	- 5	1.0244	- 6	2700
1550	1.00239	- 6	1.0095	- 2	1.0166	- 4	1.0238	- 6	2790
1600	1.00233	- 5	1.0093	- 2	1.0162	- 4	1.0232	- 6	2880
1650	1.00228	- 5	1.0091	- 3	1.0158	- 4	1.0226	- 6	2970
1700	1.00223	- 5	1.0088	- 2	1.0154	- 4	1.0220	- 6	3060
1750	1.00218	- 5	1.0086	- 3	1.0150	- 4	1.0214	- 6	3150
1800	1.00213	- 5	1.0083	- 2	1.0146	- 4	1.0208	- 5	3240
1850	1.00208	- 4	1.0081	- 2	1.0142	- 4	1.0203	- 5	3330
1900	1.00204	- 4	1.0079	- 2	1.0138	- 3	1.0198	- 5	3420
1950	1.00200	- 4	1.0077	- 1	1.0135	- 3	1.0193	- 5	3510
2000	1.00196	- 1	1.0076	- 2	1.0132	- 3	1.0188	- 4	3600
2050	1.0019		1.0074	- 1	1.0129	- 3	1.0184	- 4	3690
2100	1.0019		1.0073	- 2	1.0126	- 2	1.0180	- 4	3780
2150	1.0019		1.0071	- 1	1.0124	- 3	1.0176	- 4	3870
2200	1.0019		1.0070	- 1	1.0121	- 2	1.0172	- 3	3960
2250	1.0019	1	1.0069	- 2	1.0119	- 3	1.0169	- 4	4050
2300	1.0020	1	1.0067		1.0116	- 1	1.0165	- 2	4140
2350	1.0021	1	1.0067		1.0115	- 2	1.0163	- 3	4230
2400	1.0022	2	1.0067	- 1	1.0113	- 2	1.0160	- 3	4320
2450	1.0024	2	1.0066		1.0111	- 1	1.0157	- 2	4410
2500	1.0026	3	1.0066		1.0110	- 1	1.0155	- 2	4500
2550	1.0029	3	1.0066	1	1.0109	- 1	1.0153	- 2	4590
2600	1.0032	4	1.0067		1.0108	- 1	1.0151	- 2	4680
2650	1.0036	5	1.0067	1	1.0107		1.0149	- 1	4770
2700	1.0041	5	1.0068	1	1.0107		1.0148	- 2	4860
2750	1.0046	7	1.0069	2	1.0107	1	1.0146	- 1	4950
2800	1.0053	8	1.0071	4	1.0108	1	1.0145	1	5040
2850	1.0061	10	1.0075	4	1.0109	2	1.0146	1	5130
2900	1.0071	11	1.0079	6	1.0111	4	1.0147	2	5220
2950	1.0082	13	1.0085	7	1.0115	4	1.0149	2	5310
3000	1.0095		1.0092		1.0119		1.0151		5400

Table 2-2. DENSITY OF AIR ρ/ρ_0

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
50	.054668	-9135							90
60	.045533	-6515							108
70	.039018	-4883							126
80	.034135	-3795	.34241	-3833					144
90	.030340	-3036	.30408	-3057	1.22563	-12540	2.1617	-2251	162
100	.027304	-2483	.27351	-2498	1.10023	-10179	1.9366	-1816	180
110	.024821	-2069	.24853	-2078	.99844	- 8435	1.7550	-1498	198
120	.022752	-1751	.22775	-1757	.91409	- 7109	1.6052	-1259	216
130	.021001	-1500	.21018	-1505	.84300	- 6076	1.4793	-1074	234
140	.019501	-1301	.19513	-1303	.78224	- 5254	1.3719	- 926	252
150	.018200	-1137	.18210	-1140	.72970	- 4590	1.2793	- 809	270
160	.017063	-1004	.17070	-1005	.68380	- 4044	1.1984	- 711	288
170	.016059	- 892	.16065	- 894	.64336	- 3591	1.1273	- 632	306
180	.015167	- 799	.15171	- 799	.60745	- 3209	1.0641	- 564	324
190	.014368	- 718	.14372	- 719	.57536	- 2888	1.0077	- 507	342
200	.013650	- 650	.13653	- 651	.54648	- 2610	.9570	- 458	360
210	.013000	- 591	.13002	- 591	.52038	- 2372	.9112	- 416	378
220	.012409	- 540	.12411	- 540	.49666	- 2164	.8696	- 380	396
230	.011869	- 494	.11871	- 495	.47502	- 1983	.8316	- 348	414
240	.011375	- 455	.11376	- 455	.45519	- 1824	.7968	- 319	432
250	.010920	- 420	.10921	- 421	.43695	- 1684	.7649	- 295	450
260	.010500	- 389	.10500	- 389	.42011	- 1558	.7354	- 273	468
270	.010111	- 361	.10111	- 361	.40453	- 1447	.7081	- 254	486
280	.009750	- 337	.09750	- 336	.39006	- 1346	.6827	- 236	504
290	.009413	- 313	.09414	- 314	.37660	- 1257	.6591	- 220	522
300	.009100	- 294	.09100	- 294	.36403	- 1176	.6371	- 206	540
310	.008806	- 275	.08806	- 275	.35227	- 1101	.6165	- 193	558
320	.008531	- 259	.08531	- 259	.34126	- 1036	.5972	- 181	576
330	.008272	- 243	.08272	- 243	.33090	- 973	.5791	- 170	594
340	.008029	- 229	.08029	- 229	.32117	- 919	.5621	- 161	612
350	.007800	- 217	.07800	- 217	.31198	- 867	.5460	- 152	630
360	.007583	- 205	.07583	- 205	.30331	- 820	.5308	- 144	648
370	.007378	- 194	.07378	- 194	.29511	- 777	.5164	- 136	666
380	.007184	- 184	.07184	- 184	.28734	- 737	.5028	- 129	684
390	.007000	- 175	.07000	- 175	.27997	- 700	.4899	- 122	702
400	.006825	- 167	.06825	- 167	.27297	- 667	.4777	- 117	720
410	.006658	- 158	.06658	- 158	.26630	- 634	.4660	- 111	738
420	.006500	- 151	.06500	- 152	.25996	- 604	.4549	- 106	756
430	.006349	- 145	.06348	- 144	.25392	- 578	.4443	- 101	774
440	.006204	- 138	.06204	- 138	.24814	- 551	.4342	- 96	792
450	.006066	- 131	.06066	- 132	.24263	- 528	.4246	- 93	810
460	.005935	- 127	.05934	- 126	.23735	- 505	.4153	- 88	828
470	.005808	- 121	.05808	- 121	.23230	- 484	.4065	- 85	846
480	.005687	- 116	.05687	- 116	.22746	- 464	.3980	- 81	864
490	.005571	- 111	.05571	- 111	.22282	- 446	.3899	- 78	882
500	.005460	- 107	.05460	- 107	.21836	- 428	.3821	- 75	900
510	.005353	- 103	.05353	- 103	.21408	- 412	.3746	- 72	918
520	.005250	- 99	.05250	- 99	.20996	- 396	.3674	- 69	936
530	.005151	- 96	.05151	- 96	.20600	- 382	.3605	- 67	954
540	.005055	- 92	.05055	- 92	.20218	- 367	.3538	- 64	972
550	.004963	- 88	.04963	- 88	.19851	- 355	.3474	- 62	990
560	.004875	- 86	.04875	- 86	.19496	- 342	.3412	- 60	1008
570	.004789	- 82	.04789	- 83	.19154	- 330	.3352	- 58	1026
580	.004707	- 80	.04706	- 79	.18824	- 319	.3294	- 56	1044
590	.004627	- 77	.04627	- 77	.18505	- 309	.3238	- 54	1062
600	.004550	- 75	.04550	- 75	.18196	- 298	.3184	- 52	1080
610	.004475	- 72	.04475	- 72	.17898	- 289	.3132	- 51	1098
620	.004403	- 70	.04403	- 70	.17609	- 279	.3081	- 49	1116
630	.004333	- 68	.04333	- 68	.17330	- 271	.3032	- 47	1134
640	.004265	- 65	.04265	- 65	.17059	- 262	.29850	- 459	1152
650	.004200		.04200		.16797		.29391		1170

Table 2-2. DENSITY OF AIR - Cont.

ρ / ρ_0

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
650	.004200	- 64	.04200	- 64	.16797	- 255	.29391	- 446	1170
660	.004136	- 62	.04136	- 62	.16542	- 247	.28945	- 432	1188
670	.004074	- 60	.04074	- 60	.16295	- 239	.28513	- 419	1206
680	.004014	- 58	.04014	- 58	.16056	- 233	.28094	- 407	1224
690	.003956	- 56	.03956	- 56	.15823	- 226	.27687	- 396	1242
700	.003900	- 55	.03900	- 55	.15597	- 220	.27291	- 383	1260
710	.003845	- 54	.03845	- 54	.15377	- 213	.26908	- 375	1278
720	.003791	- 51	.03791	- 52	.15164	- 208	.26533	- 363	1296
730	.003740	- 51	.03739	- 50	.14956	- 202	.26170	- 354	1314
740	.003689	- 49	.03689	- 49	.14754	- 197	.25816	- 344	1332
750	.003640	- 48	.03640	- 48	.14557	- 191	.25472	- 335	1350
760	.003592	- 47	.03592	- 47	.14366	- 187	.25137	- 326	1368
770	.003545	- 45	.03545	- 45	.14179	- 182	.24811	- 318	1386
780	.003500	- 44	.03500	- 45	.13997	- 177	.24493	- 311	1404
790	.003456	- 44	.03455	- 43	.13820	- 173	.24182	- 302	1422
800	.003412	- 200	.034122	- 2007	.13647	- 802	.23880	- 1404	1440
850	.003212	- 179	.032115	- 1784	.12845	- 714	.22476	- 1249	1530
900	.003033	- 159	.030331	- 1596	.12131	- 638	.21227	- 1117	1620
950	.002874	- 144	.028735	- 1437	.11493	- 575	.20110	- 1005	1710
1000	.002730	- 130	.027298	- 1300	.10918	- 520	.19105	- 910	1800
1050	.002600	- 118	.025998	- 1182	.10398	- 472	.18195	- 827	1890
1100	.002482	- 108	.024816	- 1079	.09926	- 432	.17368	- 755	1980
1150	.002374	- 99	.023737	- 989	.09494	- 395	.16613	- 692	2070
1200	.002275	- 91	.022748	- 910	.09099	- 364	.15921	- 637	2160
1250	.002184	- 84	.021838	- 840	.08735	- 336	.15284	- 587	2250
1300	.002100	- 78	.020998	- 777	.08399	- 311	.14697	- 545	2340
1350	.002022	- 72	.020221	- 722	.08088	- 289	.14152	- 505	2430
1400	.001950	- 67	.019499	- 673	.07799	- 269	.13647	- 471	2520
1450	.001883	- 63	.018826	- 627	.07530	- 251	.13176	- 439	2610
1500	.001820	- 59	.018199	- 585	.07279	- 235	.12737	- 411	2700
1550	.001761	- 55	.017614	- 550	.07044	- 220	.12326	- 385	2790
1600	.001706	- 52	.017064	- 518	.06824	- 207	.11941	- 362	2880
1650	.001654	- 48	.016546	- 488	.06617	- 194	.11579	- 340	2970
1700	.001606	- 46	.016058	- 460	.06423	- 184	.11239	- 321	3060
1750	.001560	- 44	.015598	- 434	.06239	- 173	.10918	- 304	3150
1800	.001516	- 41	.015164	- 410	.06066	- 164	.10614	- 287	3240
1850	.001475	- 39	.014754	- 390	.05902	- 156	.10327	- 272	3330
1900	.001436	- 38	.014364	- 370	.05746	- 148	.10055	- 258	3420
1950	.001398	- 35	.013994	- 352	.05598	- 140	.09797	- 246	3510
2000	.001363	- 35	.013642	- 336	.05458	- 134	.09551	- 234	3600
2050	.001328	- 32	.013306	- 321	.05324	- 128	.09317	- 223	3690
2100	.001296	- 32	.012985	- 308	.05196	- 122	.09094	- 212	3780
2150	.001264	- 31	.012677	- 295	.05074	- 116	.08882	- 204	3870
2200	.001233	- 30	.012382	- 283	.04958	- 112	.08678	- 195	3960
2250	.001203	- 30	.012099	- 274	.04846	- 108	.08483	- 188	4050
2300	.001173		.011825	- 266	.04738	- 103	.08295	- 180	4140
2350			.011559	- 258	.04635	- 100	.08115	- 174	4230
2400			.011301	- 252	.04535	- 97	.07941	- 167	4320
2450			.011049	- 246	.04438	- 94	.07774	- 162	4410
2500			.010803	- 241	.04344	- 91	.07612	- 158	4500
2550			.010562	- 237	.04253	- 89	.07454	- 153	4590
2600			.010325	- 235	.04164	- 87	.07301	- 149	4680
2650			.010090	- 233	.04077	- 85	.07152	- 145	4770
2700			.009857	- 230	.03992	- 83	.07007	- 142	4860
2750			.009627	- 229	.03909	- 82	.06865	- 139	4950
2800			.009398	- 227	.03827	- 81	.06726	- 137	5040
2850			.009171	- 225	.03746	- 80	.06589	- 134	5130
2900			.008946	- 223	.03666	- 79	.06455	- 134	5220
2950			.008723	- 219	.03587	- 78	.06321	- 132	5310
3000			.008504		.03509		.06189		5400

Table 2-2. DENSITY OF AIR - Cont.

ρ/ρ_0

°K	1 atm		4 atm		7 atm		10 atm		°R
100	2.7830	-2646							180
110	2.5184	-2173	10.577	-1026	19.618	-2187	30.139	-4001	198
120	2.3011	-1820	9.551	- 827	17.431	-1675	26.138	-2831	216
130	2.1191	-1549	8.724	- 685	15.756	-1338	23.307	-2161	234
140	1.9642	-1334	8.039	- 580	14.418	-1108	21.146	-1740	252
150	1.8308	-1163	7.459	- 498	13.310	- 935	19.406	-1439	270
160	1.7145	-1022	6.961	- 432	12.375	- 803	17.967	-1219	288
170	1.6123	- 906	6.529	- 380	11.572	- 699	16.748	-1049	306
180	1.5217	- 809	6.149	- 337	10.873	- 614	15.699	- 916	324
190	1.4408	- 727	5.812	- 301	10.259	- 546	14.783	- 807	342
200	1.3681	- 656	5.511	- 271	9.713	- 487	13.976	- 719	360
210	1.3025	- 596	5.240	- 244	9.226	- 440	13.257	- 644	378
220	1.2429	- 544	4.996	- 223	8.786	- 398	12.613	- 582	396
230	1.1885	- 495	4.773	- 203	8.388	- 362	12.031	- 528	414
240	1.1390	- 460	4.570	- 186	8.026	- 332	11.503	- 482	432
250	1.0930	- 422	4.384	- 172	7.694	- 305	11.021	- 442	450
260	1.0508	- 391	4.212	- 158	7.389	- 281	10.579	- 407	468
270	1.0117	- 362	4.054	- 147	7.108	- 260	10.172	- 375	486
280	.9755	- 338	3.907	- 136	6.848	- 241	9.797	- 348	504
290	.9417	- 315	3.771	- 127	6.607	- 224	9.449	- 324	522
300	.9102	- 294	3.644	- 119	6.383	- 210	9.125	- 301	540
310	.8808	- 276	3.525	- 111	6.173	- 196	8.824	- 282	558
320	.8532	- 259	3.414	- 104	5.977	- 183	8.542	- 264	576
330	.8273	- 244	3.310	- 98	5.794	- 173	8.278	- 248	594
340	.8029	- 229	3.212	- 92	5.621	- 162	8.030	- 233	612
350	.7800	- 217	3.1196	- 872	5.459	- 154	7.797	- 220	630
360	.7583	- 206	3.0324	- 824	5.305	- 144	7.577	- 207	648
370	.7377	- 194	2.9500	- 781	5.161	- 137	7.370	- 197	666
380	.7183	- 184	2.8719	- 740	5.024	- 130	7.173	- 186	684
390	.6999	- 176	2.7979	- 702	4.894	- 123	6.987	- 176	702
400	.6823	- 166	2.7277	- 668	4.771	- 118	6.811	- 168	720
410	.6657	- 159	2.6609	- 636	4.653	- 111	6.643	- 159	738
420	.6498	- 151	2.5973	- 606	4.542	- 106	6.484	- 152	756
430	.6347	- 144	2.5367	- 578	4.436	- 102	6.332	- 145	774
440	.6203	- 138	2.4789	- 552	4.334	- 96	6.187	- 139	792
450	.6065	- 132	2.4237	- 528	4.238	- 93	6.048	- 132	810
460	.5933	- 126	2.3709	- 506	4.145	- 88	5.916	- 126	828
470	.5807	- 122	2.3203	- 484	4.057	- 85	5.790	- 122	846
480	.5685	- 116	2.2719	- 465	3.972	- 81	5.668	- 116	864
490	.5569	- 111	2.2254	- 445	3.891	- 78	5.552	- 111	882
500	.5458	- 107	2.1809	- 429	3.813	- 75	5.441	- 107	900
510	.5351	- 103	2.1380	- 411	3.738	- 72	5.334	- 103	918
520	.5248	- 99	2.0969	- 396	3.666	- 70	5.231	- 99	936
530	.5149	- 95	2.0573	- 382	3.596	- 66	5.132	- 95	954
540	.5054	- 92	2.0191	- 367	3.530	- 65	5.037	- 92	972
550	.4962	- 89	1.9824	- 355	3.465	- 62	4.945	- 89	990
560	.4873	- 86	1.9469	- 341	3.403	- 59	4.856	- 85	1008
570	.4787	- 82	1.9128	- 330	3.344	- 58	4.771	- 82	1026
580	.4705	- 80	1.8798	- 319	3.286	- 56	4.689	- 80	1044
590	.4625	- 77	1.8479	- 308	3.230	- 54	4.609	- 77	1062
600	.4548	- 74	1.8171	- 298	3.176	- 52	4.532	- 74	1080
610	.4474	- 73	1.7873	- 288	3.124	- 50	4.458	- 72	1098
620	.4401	- 69	1.7585	- 280	3.074	- 49	4.386	- 70	1116
630	.4332	- 68	1.7305	- 270	3.025	- 47	4.316	- 67	1134
640	.4264	- 66	1.7035	- 262	2.9778	- 458	4.249	- 65	1152
650	.4198		1.6773		2.9320		4.184		1170

Table 2-2. DENSITY OF AIR - Cont. ρ/ρ_0

°K	1 atm		4 atm		7 atm		10 atm		°R
650	.4198	- 63	1.6773	- 254	2.9320	- 445	4.184	- 64	1170
660	.4135	- 62	1.6519	- 247	2.8875	- 431	4.120	- 61	1188
670	.4073	- 60	1.6272	- 239	2.8444	- 418	4.059	- 60	1206
680	.4013	- 58	1.6033	- 232	2.8026	- 406	3.999	- 58	1224
690	.3955	- 57	1.5801	- 226	2.7620	- 394	3.941	- 56	1242
700	.3898	- 55	1.5575	- 219	2.7226	- 384	3.885	- 55	1260
710	.3843	- 53	1.5356	- 213	2.6842	- 372	3.830	- 53	1278
720	.3790	- 52	1.5143	- 208	2.6470	- 362	3.777	- 52	1296
730	.3738	- 50	1.4935	- 202	2.6108	- 353	3.725	- 50	1314
740	.3688	- 49	1.4733	- 196	2.5755	- 343	3.675	- 49	1332
750	.3639	- 48	1.4537	- 191	2.5412	- 334	3.626	- 48	1350
760	.3591	- 47	1.4346	- 186	2.5078	- 326	3.578	- 46	1368
770	.3544	- 45	1.4160	- 182	2.4752	- 317	3.532	- 45	1386
780	.3499	- 45	1.3978	- 177	2.4435	- 309	3.487	- 44	1404
790	.3454	- 43	1.3801	- 172	2.4126	- 301	3.443	- 43	1422
800	.3411	- 200	1.3629	- 801	2.3825	- 1400	3.400	- 200	1440
850	.3211	- 179	1.2828	- 713	2.2425	- 1245	3.200	- 177	1530
900	.3032	- 159	1.2115	- 637	2.1180	- 1113	3.023	- 159	1620
950	.28726	- 1436	1.1478	- 573	2.0067	- 1002	2.864	- 143	1710
1000	.27290	- 1299	1.0905	- 519	1.9065	- 907	2.721	- 129	1800
1050	.25991	- 1182	1.0386	- 472	1.8158	- 824	2.592	- 118	1890
1100	.24809	- 1078	.9914	- 431	1.7334	- 752	2.474	- 107	1980
1150	.23731	- 989	.9483	- 394	1.6582	- 690	2.367	- 99	2070
1200	.22742	- 909	.9089	- 364	1.5892	- 635	2.268	- 90	2160
1250	.21833	- 840	.8725	- 335	1.5257	- 586	2.178	- 84	2250
1300	.20993	- 777	.8390	- 311	1.4671	- 542	2.094	- 77	2340
1350	.20216	- 722	.8079	- 288	1.4129	- 504	2.017	- 72	2430
1400	.19494	- 672	.7791	- 268	1.3625	- 469	1.945	- 67	2520
1450	.18822	- 627	.7523	- 251	1.3156	- 438	1.878	- 63	2610
1500	.18195	- 587	.7272	- 234	1.2718	- 410	1.815	- 65	2700
1550	.17608	- 550	.7038	- 220	1.2308	- 384	1.750	- 48	2790
1600	.17058	- 517	.6818	- 207	1.1924	- 361	1.702	- 52	2880
1650	.16541	- 487	.6611	- 194	1.1563	- 340	1.650	- 48	2970
1700	.16054	- 458	.6417	- 183	1.1223	- 320	1.602	- 45	3060
1750	.15596	- 434	.6234	- 173	1.0903	- 303	1.557	- 44	3150
1800	.15162	- 410	.6061	- 164	1.0600	- 286	1.513	- 40	3240
1850	.14752	- 388	.5897	- 155	1.0314	- 271	1.473	- 39	3330
1900	.14364	- 369	.5742	- 147	1.0043	- 257	1.434	- 37	3420
1950	.13995	- 350	.5595	- 140	.9786	- 245	1.397	- 35	3510
2000	.13645	- 335	.5455	- 134	.9541	- 232	1.362	- 33	3600
2050	.13310	- 318	.5321	- 127	.9309	- 222	1.329	- 32	3690
2100	.12992	- 304	.5194	- 121	.9087	- 211	1.297	- 30	3780
2150	.12688	- 289	.5073	- 115	.8876	- 202	1.267	- 28	3870
2200	.12399	- 280	.4958	- 111	.8674	- 194	1.239	- 28	3960
2250	.12119	- 267	.4847	- 106	.8480	- 185	1.211	- 26	4050
2300	.11852	- 256	.4741	- 102	.8295	- 178	1.185	- 26	4140
2350	.11596	- 248	.4639	- 97	.8117	- 170	1.159	- 24	4230
2400	.11348	- 238	.4542	- 94	.7947	- 164	1.135	- 23	4320
2450	.11110	- 230	.4448	- 91	.7783	- 158	1.112	- 23	4410
2500	.10880	- 223	.4357	- 87	.7625	- 151	1.089	- 22	4500
2550	.10657	- 216	.4270	- 85	.7474	- 147	1.067	- 20	4590
2600	.10441	- 211	.4185	- 82	.7327	- 142	1.047	- 21	4680
2650	.10230	- 206	.4103	- 79	.7185	- 137	1.026	- 19	4770
2700	.10024	- 199	.4024	- 77	.7048	- 133	1.007	- 19	4860
2750	.09825	- 195	.3947	- 74	.6915	- 129	.988	- 18	4950
2800	.09630	- 192	.3873	- 73	.6786	- 126	.970	- 18	5040
2850	.09438	- 189	.3800	- 71	.6660	- 122	.952	- 17	5130
2900	.09249	- 187	.3729	- 69	.6538	- 119	.935	- 17	5220
2950	.09062	- 186	.3660	- 68	.6419	- 117	.918	- 17	5310
3000	.08876		.3592		.6302		.901		5400

Table 2-2. DENSITY OF AIR - Cont.

ρ/ρ_0

°K	10 atm		40 atm		70 atm		100 atm		°R
150	19.406	-1439	106.6	-178					270
160	17.967	-1219	88.76	-1060					288
170	16.748	-1049	78.16	- 753					306
180	15.699	- 916	70.63	- 581	140.6	-162	218.3	-293	324
190	14.783	- 807	64.82	- 469	124.37	-1171	189.0	-206	342
200	13.976	- 719	60.13	- 391	112.66	- 905	168.40	-1535	360
210	13.257	- 644	56.22	- 334	103.61	- 731	153.05	-1206	378
220	12.613	- 582	52.88	- 289	96.30	- 611	140.99	- 981	396
230	12.031	- 528	49.99	- 255	90.19	- 520	131.18	- 821	414
240	11.503	- 482	47.44	- 226	84.99	- 451	122.97	- 702	432
250	11.021	- 442	45.18	- 203	80.48	- 397	115.95	- 609	450
260	10.579	- 407	43.15	- 184	76.51	- 353	109.86	- 535	468
270	10.172	- 375	41.31	- 167	72.98	- 317	104.51	- 477	486
280	9.797	- 348	39.64	- 152	69.81	- 286	99.74	- 427	504
290	9.449	- 324	38.12	- 140	66.95	- 261	95.47	- 386	522
300	9.125	- 301	36.72	- 130	64.34	- 238	91.61	- 352	540
310	8.824	- 282	35.42	- 120	61.96	- 219	88.09	- 321	558
320	8.542	- 264	34.22	- 111	59.77	- 203	84.88	- 296	576
330	8.278	- 248	33.11	- 104	57.74	- 188	81.92	- 274	594
340	8.030	- 233	32.07	- 97	55.86	- 175	79.18	- 253	612
350	7.797	- 220	31.097	- 911	54.11	- 163	76.65	- 236	630
360	7.577	- 207	30.186	- 856	52.48	- 153	74.29	- 220	648
370	7.370	- 197	29.330	- 807	50.95	- 143	72.09	- 206	666
380	7.173	- 186	28.523	- 760	49.52	- 135	70.03	- 194	684
390	6.987	- 176	27.763	- 720	48.17	- 128	68.09	- 182	702
400	6.811	- 168	27.043	- 682	46.89	- 120	66.27	- 172	720
410	6.643	- 159	26.361	- 646	45.69	- 114	64.55	- 162	738
420	6.484	- 152	25.715	- 614	44.55	- 108	62.93	- 154	756
430	6.332	- 145	25.101	- 585	43.47	- 102	61.39	- 146	774
440	6.187	- 139	24.516	- 557	42.45	- 98	59.93	- 138	792
450	6.048	- 132	23.959	- 531	41.47	- 92	58.55	- 132	810
460	5.916	- 126	23.428	- 507	40.55	- 89	57.23	- 126	828
470	5.790	- 122	22.921	- 486	39.66	- 85	55.97	- 120	846
480	5.668	- 116	22.435	- 464	38.81	- 80	54.77	- 114	864
490	5.552	- 111	21.971	- 445	38.01	- 78	53.63	- 110	882
500	5.441	- 107	21.526	- 427	37.23	- 74	52.53	- 104	900
510	5.334	- 103	21.099	- 410	36.49	- 71	51.49	- 101	918
520	5.231	- 99	20.689	- 394	35.78	- 69	50.48	- 96	936
530	5.132	- 95	20.295	- 378	35.09	- 65	49.52	- 93	954
540	5.037	- 92	19.917	- 365	34.44	- 63	48.59	- 89	972
550	4.945	- 89	19.552	- 351	33.81	- 61	47.70	- 86	990
560	4.856	- 85	19.201	- 338	33.20	- 59	46.84	- 82	1008
570	4.771	- 82	18.863	- 326	32.61	- 56	46.02	- 80	1026
580	4.689	- 80	18.537	- 315	32.05	- 55	45.22	- 77	1044
590	4.609	- 77	18.222	- 305	31.50	- 52	44.45	- 74	1062
600	4.532	- 74	17.917	- 294	30.977	- 508	43.71	- 71	1080
610	4.458	- 72	17.623	- 284	30.469	- 490	43.00	- 69	1098
620	4.386	- 70	17.339	- 276	29.979	- 475	42.31	- 67	1116
630	4.316	- 67	17.063	- 266	29.504	- 460	41.64	- 65	1134
640	4.249	- 65	16.797	- 258	29.044	- 445	40.99	- 63	1152
650	4.184	- 64	16.539	- 250	28.599	- 432	40.36	- 60	1170
660	4.120	- 61	16.289	- 243	28.167	- 418	39.76	- 59	1188
670	4.059	- 60	16.046	- 236	27.749	- 405	39.17	- 57	1206
680	3.999	- 58	15.810	- 228	27.344	- 394	38.60	- 55	1224
690	3.941	- 56	15.582	- 222	26.950	- 383	38.05	- 54	1242
700	3.885		15.360		26.567		37.51		1260

Table 2-2. DENSITY OF AIR - Cont.

ρ/ρ_0

°K	10 atm		40 atm		70 atm		100 atm		°R
700	3.885	- 55	15.360	- 216	26.567	- 371	37.51	- 52	1260
710	3.830	- 53	15.144	- 209	26.196	- 362	36.99	- 51	1278
720	3.777	- 52	14.935	- 204	25.834	- 351	36.48	- 50	1296
730	3.725	- 50	14.731	- 198	25.483	- 341	35.98	- 48	1314
740	3.675	- 49	14.533	- 193	25.142	- 333	35.50	- 46	1332
750	3.626	- 48	14.340	- 187	24.809	- 323	35.04	- 46	1350
760	3.578	- 46	14.153	- 183	24.486	- 315	34.58	- 44	1368
770	3.532	- 45	13.970	- 179	24.171	- 307	34.14	- 43	1386
780	3.487	- 44	13.791	- 173	23.864	- 299	33.71	- 42	1404
790	3.443	- 43	13.618	- 169	23.565	- 291	33.29	- 41	1422
800	3.400	- 200	13.449	- 786	23.274	- 1353	32.879	- 1900	1440
850	3.200	- 177	12.663	- 699	21.921	- 1201	30.979	- 1689	1530
900	3.023	- 159	11.964	- 625	20.720	- 1077	29.290	- 1511	1620
950	2.864	- 143	11.339	- 562	19.643	- 968	27.779	- 1360	1710
1000	2.721	- 129	10.777	- 509	18.675	- 877	26.419	- 1232	1800
1050	2.592	- 118	10.268	- 463	17.798	- 797	25.187	- 1121	1890
1100	2.474	- 107	9.805	- 423	17.001	- 728	24.066	- 1024	1980
1150	2.367	- 99	9.382	- 388	16.273	- 668	23.042	- 939	2070
1200	2.268	- 90	8.994	- 356	15.605	- 615	22.103	- 866	2160
1250	2.178	- 84	8.638	- 330	14.990	- 568	21.237	- 799	2250
1300	2.094	- 77	8.308	- 305	14.422	- 527	20.438	- 742	2340
1350	2.017	- 72	8.003	- 283	13.895	- 489	19.696	- 689	2430
1400	1.945	- 67	7.720	- 264	13.406	- 455	19.007	- 642	2520
1450	1.878	- 63	7.456	- 247	12.951	- 426	18.365	- 599	2610
1500	1.815	- 65	7.209	- 230	12.525	- 398	17.766	- 563	2700
1550	1.750	- 48	6.979	- 217	12.127	- 374	17.203	- 528	2790
1600	1.702	- 52	6.762	- 204	11.753	- 352	16.675	- 496	2880
1650	1.650	- 48	6.558	- 191	11.401	- 331	16.179	- 467	2970
1700	1.602	- 45	6.367	- 180	11.070	- 312	15.712	- 440	3060
1750	1.557	- 44	6.187	- 171	10.758	- 295	15.272	- 415	3150
1800	1.513	- 40	6.016	- 161	10.463	- 278	14.857	- 394	3240
1850	1.473	- 39	5.855	- 153	10.185	- 264	14.463	- 374	3330
1900	1.434	- 37	5.702	- 145	9.921	- 252	14.089	- 355	3420
1950	1.397	- 35	5.557	- 138	9.669	- 239	13.734	- 336	3510
2000	1.362	- 33	5.419	- 132	9.430	- 227	13.398	- 322	3600
2050	1.329	- 32	5.287	- 125	9.203	- 217	13.076	- 306	3690
2100	1.297	- 30	5.162	- 119	8.986	- 207	12.770	- 292	3780
2150	1.267	- 28	5.043	- 114	8.779	- 197	12.478	- 279	3870
2200	1.239	- 28	4.929	- 109	8.582	- 189	12.199	- 268	3960
2250	1.211	- 26	4.820	- 104	8.393	- 180	11.931	- 255	4050
2300	1.185	- 26	4.716	- 100	8.213	- 174	11.676	- 246	4140
2350	1.159	- 24	4.616	- 96	8.039	- 166	11.430	- 235	4230
2400	1.135	- 23	4.520	- 92	7.873	- 159	11.195	- 225	4320
2450	1.112	- 23	4.428	- 89	7.714	- 154	10.970	- 217	4410
2500	1.089	- 22	4.339	- 85	7.560	- 147	10.753	- 209	4500
2550	1.067	- 20	4.254	- 82	7.413	- 142	10.544	- 201	4590
2600	1.047	- 21	4.172	- 79	7.271	- 136	10.343	- 193	4680
2650	1.026	- 19	4.093	- 76	7.135	- 132	10.150	- 187	4770
2700	1.007	- 19	4.017	- 73	7.003	- 128	9.963	- 179	4860
2750	.988	- 18	3.944	- 72	6.875	- 123	9.784	- 174	4950
2800	.970	- 18	3.872	- 69	6.752	- 119	9.610	- 169	5040
2850	.952	- 17	3.803	- 67	6.633	- 116	9.441	- 164	5130
2900	.935	- 17	3.736	- 66	6.517	- 113	9.277	- 159	5220
2950	.918	- 17	3.670	- 63	6.404	- 109	9.118	- 154	5310
3000	.901		3.607		6.295		8.964		5400

Table 2-3. SPECIFIC HEAT OF AIR C_p/R

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
50	3.5001	- 41							90
60	3.4960	- 20							108
70	3.4940	- 10							126
80	3.4930	- 5							144
90	3.4925	- 3	3.5030	- 32	3.5398	- 135	3.5787	- 250	162
100	3.4922	- 2	3.4998	- 19	3.5263	- 84	3.5537	- 153	180
110	3.4920	- 1	3.4979	- 14	3.5179	- 57	3.5384	- 101	198
120	3.4919	- 1	3.4965	- 10	3.5122	- 41	3.5283	- 73	216
130	3.4918		3.4955	- 7	3.5081	- 30	3.5210	- 53	234
140	3.4918		3.4948	- 4	3.5051	- 21	3.5157	- 40	252
150	3.4918		3.4944	- 4	3.5030	- 17	3.5117	- 30	270
160	3.4918		3.4940	- 3	3.5013	- 13	3.5087	- 24	288
170	3.4918	1	3.4937	- 2	3.5000	- 11	3.5063	- 19	306
180	3.4919	1	3.4935		3.4989	- 7	3.5044	- 15	324
190	3.4920	3	3.4935		3.4982	- 4	3.5029	- 9	342
200	3.4923	2	3.4935	1	3.4978	- 4	3.3020	- 9	360
210	3.4925	3	3.4936	2	3.4974	- 3	3.5011	- 6	378
220	3.4928	5	3.4938	4	3.4971	1	3.5005	- 3	396
230	3.4933	5	3.4942	4	3.4972	1	3.5002	- 2	414
240	3.4938	8	3.4946	7	3.4973	5	3.5000	3	432
250	3.4946	8	3.4953	7	3.4978	5	3.5003	2	450
260	3.4954	10	3.4960	10	3.4983	7	3.5005	6	468
270	3.4964	12	3.4970	11	3.4990	10	3.5011	8	486
280	3.4976	14	3.4981	14	3.5000	12	3.5019	11	504
290	3.4990	16	3.4995	15	3.5012	14	3.5030	13	522
300	3.5006	19	3.5010	20	3.5026	18	3.5043	16	540
310	3.5025	20	3.5030	20	3.5044	19	3.5059	17	558
320	3.5045	24	3.5050	23	3.5063	22	3.5076	22	576
330	3.5069	25	3.5073	25	3.5085	24	3.5098	23	594
340	3.5094	28	3.5098	28	3.5109	28	3.5121	27	612
350	3.5122	31	3.5126	30	3.5137	30	3.5148	30	630
360	3.5153	33	3.5156	33	3.5167	32	3.5178	31	648
370	3.5186	38	3.5189	38	3.5199	38	3.5209	37	666
380	3.5224	39	3.5227	39	3.5237	38	3.5246	38	684
390	3.5263	42	3.5266	42	3.5275	41	3.5284	41	702
400	3.5305	44	3.5308	44	3.5316	43	3.5325	42	720
410	3.5349	48	3.5352	47	3.5359	48	3.5367	47	738
420	3.5397	50	3.5399	50	3.5407	50	3.5414	50	756
430	3.5447	53	3.5449	53	3.5457	51	3.5464	51	774
440	3.5500	55	3.5502	55	3.5508	56	3.5515	55	792
450	3.5555	58	3.5557	58	3.5564	57	3.5570	57	810
460	3.5613	60	3.5615	60	3.5621	60	3.5627	60	828
470	3.5673	62	3.5675	62	3.5681	61	3.5687	61	846
480	3.5735	64	3.5737	64	3.5742	64	3.5748	63	864
490	3.5799	66	3.5801	66	3.3806	66	3.5811	66	882
500	3.5865	68	3.5867	68	3.5872	67	3.5877	67	900
510	3.5933	70	3.5935	70	3.5939	70	3.5944	70	918
520	3.6003	72	3.6005	72	3.6009	72	3.6014	71	936
530	3.6075	74	3.6077	73	3.6081	74	3.6085	74	954
540	3.6149	75	3.6150	75	3.6155	74	3.6159	75	972
550	3.6224	76	3.6225	76	3.6229	76	3.6234	75	990
560	3.6300	77	3.6301	77	3.6305	77	3.6309	77	1008
570	3.6377	79	3.6378	79	3.6382	79	3.6386	78	1026
580	3.6456	79	3.6457	79	3.6461	79	3.6464	79	1044
590	3.6535	80	3.6536	80	3.6540	79	3.6543	79	1062
600	3.6615	81	3.6616	81	3.6619	81	3.6622	81	1080
610	3.6696	82	3.6697	82	3.6700	82	3.6703	82	1098
620	3.6778	82	3.6779	82	3.6782	82	3.6785	82	1116
630	3.6860	83	3.6861	83	3.6864	83	3.6867	83	1134
640	3.6943	84	3.6944	84	3.6947	84	3.6950	83	1152
650	3.7027		3.7028		3.7031		3.7033		1170

Table 2-3. SPECIFIC HEAT OF AIR - Cont.

Cp/R

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
650	3.7027	84	3.7028	84	3.7031	84	3.7033	84	1170
660	3.7111	84	3.7112	83	3.7115	83	3.7117	84	1188
670	3.7195	84	3.7195	85	3.7198	84	3.7201	84	1206
680	3.7279	84	3.7280	84	3.7282	84	3.7285	84	1224
690	3.7363	84	3.7364	84	3.7366	84	3.7369	84	1242
700	3.7447	84	3.7448	84	3.7450	84	3.7453	83	1260
710	3.7531	83	3.7532	83	3.7534	83	3.7536	83	1278
720	3.7614	84	3.7615	84	3.7617	84	3.7619	84	1296
730	3.7698	84	3.7699	84	3.7701	84	3.7703	84	1314
740	3.7782	83	3.7783	83	3.7785	83	3.7787	83	1332
750	3.7865	82	3.7866	82	3.7868	82	3.7870	82	1350
760	3.7947	83	3.7948	83	3.7950	82	3.7952	82	1368
770	3.8030	82	3.8031	82	3.8032	82	3.8034	82	1386
780	3.8112	82	3.8113	82	3.8114	82	3.8116	82	1404
790	3.8194	9	3.8195	8	3.8196	8	3.8198	8	1422
800	3.828	40	3.828	41	3.828	41	3.828	41	1440
850	3.868	38	3.869	37	3.869	37	3.869	37	1530
900	3.906	38	3.906	38	3.906	38	3.906	38	1620
950	3.944	35	3.944	35	3.944	35	3.944	35	1710
1000	3.979	34	3.979	34	3.979	34	3.979	34	1800
1050	4.013	33	4.013	33	4.013	33	4.013	33	1890
1100	4.046	32	4.046	32	4.046	32	4.046	32	1980
1150	4.078	31	4.078	31	4.078	31	4.078	31	2070
1200	4.109	31	4.109	31	4.109	31	4.109	31	2160
1250	4.140	31	4.140	31	4.140	31	4.140	31	2250
1300	4.171	30	4.171	30	4.171	30	4.171	30	2340
1350	4.201	31	4.201	29	4.201	29	4.201	29	2430
1400	4.232	33	4.230	30	4.230	30	4.230	30	2520
1450	4.265	36	4.260	29	4.260	29	4.260	29	2610
1500	4.301	38	4.289	33	4.289	32	4.289	32	2700
1550	4.339	41	4.322	34	4.321	31	4.321	31	2790
1600	4.380	47	4.356	37	4.352	35	4.352	34	2880
1650	4.427	52	4.393	38	4.387	34	4.386	33	2970
1700	4.479	67	4.431	42	4.421	36	4.419	34	3060
1750	4.546	86	4.473	48	4.457	40	4.453	37	3150
1800	4.632	111	4.521	56	4.497	42	4.490	39	3240
1850	4.743	145	4.577	67	4.539	47	4.529	44	3330
1900	4.888	188	4.644	88	4.586	57	4.753	48	3420
1950	5.076	250	4.732	107	4.643	68	4.621	55	3510
2000	5.326	34	4.839	121	4.711	73	4.676	62	3600
2050	5.67	44	4.960	136	4.784	82	4.738	68	3690
2100	6.11	51	5.096	182	4.866	107	4.806	84	3780
2150	6.62	59	5.278	217	4.973	122	4.890	103	3870
2200	7.21	66	5.495	275	5.095	155	4.993	121	3960
2250	7.87	70	5.770	326	5.250	175	5.114	142	4050
2300	8.57		6.096	360	5.425	200	5.256	163	4140
2350			6.456	436	5.625	234	5.419	185	4230
2400			6.892	528	5.859	271	5.604	212	4320
2450			7.420	595	6.130	324	5.816	248	4410
2500			8.015	58	6.454	34	6.064	26	4500
2550			8.60	81	6.79	37	6.32	28	4590
2600			9.41	81	7.16	41	6.60	31	4680
2650			10.22	89	7.57	45	6.91	35	4770
2700			11.11	96	8.02	48	7.26	37	4860
2750			12.07	101	8.50	52	7.63	39	4950
2800			13.08		9.02		8.02		5040

Table 2-3. SPECIFIC HEAT OF AIR - Cont. C_p/R

°K	1 atm		4 atm		7 atm		10 atm		°R
100	3.5824	- 228							180
110	3.5596	- 149	3.8166	- 832	4.163	-181	4.807	-482	198
120	3.5447	- 107	3.7334	- 544	3.982	-125	4.325	-244	216
130	3.5340	- 77	3.6790	- 372	3.857	- 79	4.081	-142	234
140	3.5263	- 58	3.6418	- 271	3.778	- 56	3.939	- 95	252
150	3.5205	- 44	3.6147	- 196	3.7219	- 403	3.8440	- 660	270
160	3.5161	- 35	3.5951	- 158	3.6816	- 302	3.7780	- 483	288
170	3.5126	- 27	3.5793	- 123	3.6514	- 235	3.7297	- 365	306
180	3.5099	- 21	3.5670	- 97	3.6279	- 183	3.6932	- 288	324
190	3.5078	- 16	3.5573	- 78	3.6096	- 146	3.6644	- 217	342
200	3.5062	- 13	3.5495	- 63	3.5950	- 119	3.6427	- 183	360
210	3.5049	- 11	3.5432	- 53	3.5831	- 100	3.6244	- 149	378
220	3.5038	- 6	3.5379	- 42	3.5731	- 80	3.6095	- 123	396
230	3.5032	- 4	3.5337	- 35	3.5651	- 67	3.5972	- 101	414
240	3.5028	- 1	3.5302	- 25	3.5584	- 53	3.5871	- 82	432
250	3.5027	1	3.5277	- 22	3.5531	- 46	3.5789	- 70	450
260	3.5028	3	3.5255	- 15	3.5485	- 35	3.5719	- 56	468
270	3.5031	7	3.5240	- 12	3.5450	- 30	3.5663	- 49	486
280	3.5038	9	3.5228	- 6	3.5420	- 22	3.5614	- 38	504
290	3.5047	12	3.5222	- 2	3.5398	- 15	3.5576	- 30	522
300	3.5059	15	3.5220	3	3.5383	- 9	3.5546	- 21	540
310	3.5074	17	3.5223	6	3.5374	- 5	3.5525	- 17	558
320	3.5091	21	3.5229	11	3.5369	2	3.5508	- 8	576
330	3.5112	22	3.5240	14	3.5371	4	3.5500	- 3	594
340	3.5134	26	3.5254	19	3.5375	11	3.5497	3	612
350	3.5160	28	3.5273	21	3.5386	15	3.5500	7	630
360	3.5188	31	3.5294	25	3.5401	18	3.5507	12	648
370	3.5219	36	3.5319	30	3.5419	24	3.5519	17	666
380	3.5255	37	3.5349	32	3.5443	26	3.5536	21	684
390	3.5292	41	3.5381	35	3.5469	31	3.5557	26	702
400	3.5333	43	3.5416	38	3.5500	33	3.5583	28	720
410	3.5376	46	3.5454	43	3.5533	39	3.5611	34	738
420	3.5422	49	3.5497	45	3.5572	40	3.5645	37	756
430	3.5471	52	3.5542	47	3.5612	44	3.5682	40	774
440	3.5523	54	3.5589	51	3.5656	48	3.5722	45	792
450	3.5577	57	3.5640	54	3.5704	51	3.5767	48	810
460	3.5634	59	3.5694	56	3.5755	54	3.5815	50	828
470	3.5693	61	3.5750	59	3.5809	55	3.5865	54	846
480	3.5754	63	3.5809	60	3.5864	58	3.5919	56	864
490	3.5817	65	3.5869	63	3.5922	61	3.5975	57	882
500	3.5882	67	3.5932	65	3.5983	63	3.6032	61	900
510	3.5949	70	3.5997	68	3.6046	65	3.6093	63	918
520	3.6019	71	3.6065	69	3.6111	68	3.6156	66	936
530	3.6090	73	3.6134	72	3.6179	69	3.6222	68	954
540	3.6163	75	3.6206	72	3.6248	71	3.6290	69	972
550	3.6238	75	3.6278	74	3.6319	71	3.6359	71	990
560	3.6313	77	3.6352	75	3.6390	75	3.6430	72	1008
570	3.6390	78	3.6427	77	3.6465	76	3.6502	74	1026
580	3.6468	79	3.6504	78	3.6541	75	3.6576	74	1044
590	3.6547	79	3.6582	78	3.6616	77	3.6650	76	1062
600	3.6626	81	3.6660	82	3.6693	79	3.6726	77	1080
610	3.6707	81	3.6742	78	3.6772	79	3.6803	77	1098
620	3.6788	82	3.6820	80	3.6851	79	3.6880	78	1116
630	3.6870	83	3.6900	82	3.6930	81	3.6958	80	1134
640	3.6953	83	3.6982	82	3.7011	82	3.7038	81	1152
650	3.7036		3.7064		3.7093		3.7119		1170

Table 2-3. SPECIFIC HEAT OF AIR - Cont. C_p/R

°K	1 atm		4 atm		7 atm		10 atm		°R
650	3.7036	84	3.7064	83	3.7093	81	3.7119	81	1170
660	3.7120	84	3.7147	83	3.7174	82	3.7200	81	1188
670	3.7204	84	3.7230	83	3.7256	82	3.7281	81	1206
680	3.7288	83	3.7313	83	3.7338	82	3.7362	81	1224
690	3.7371	84	3.7396	83	3.7420	82	3.7443	82	1242
700	3.7455	83	3.7479	83	3.7502	83	3.7525	81	1260
710	3.7538	83	3.7562	81	3.7585	80	3.7606	81	1278
720	3.7621	84	3.7643	84	3.7665	84	3.7687	82	1296
730	3.7705	84	3.7727	83	3.7749	82	3.7769	82	1314
740	3.7789	83	3.7810	82	3.7831	81	3.7851	81	1332
750	3.7872	82	3.7892	81	3.7912	81	3.7932	81	1350
760	3.7954	82	3.7973	82	3.7993	81	3.8013	81	1368
770	3.8036	82	3.8055	82	3.8074	81	3.8094	80	1386
780	3.8118	82	3.8137	81	3.8155	81	3.8174	80	1404
790	3.8200	8	3.8218	8	3.8236	8	3.8254	9	1422
800	3.828	39	3.830	41	3.832	40	3.834	39	1440
850	3.869	37	3.871	37	3.872	37	3.873	37	1530
900	3.906	38	3.908	38	3.909	38	3.910	38	1620
950	3.944	35	3.946	34	3.947	35	3.948	35	1710
1000	3.979	34	3.980	34	3.982	33	3.983	33	1800
1050	4.013	33	3.014	33	4.015	33	4.016	33	1890
1100	4.046	32	4.047	32	4.048	32	4.049	32	1980
1150	4.078	31	4.079	31	4.080	31	4.081	30	2070
1200	4.109	31	4.110	31	4.111	30	4.111	31	2160
1250	4.140	31	4.141	31	4.141	31	4.142	31	2250
1300	4.171	30	4.172	30	4.172	30	4.173	30	2340
1350	4.201	29	4.202	29	4.202	29	4.203	29	2430
1400	4.230	30	4.231	30	4.231	30	4.232	29	2520
1450	4.260	29	4.261	29	4.261	29	4.261	29	2610
1500	4.289	32	4.290	30	4.290	30	4.290	30	2700
1550	4.321	31	4.320	31	4.320	31	4.320	31	2790
1600	4.352	33	4.351	31	4.351	31	4.351	31	2880
1650	4.385	33	4.382	32	4.382	31	4.382	32	2970
1700	4.418	33	4.414	32	4.413	32	4.414	31	3060
1750	4.451	36	4.446	34	4.445	34	4.445	33	3150
1800	4.487	37	4.480	33	4.479	32	4.478	31	3240
1850	4.524	42	4.513	36	4.511	33	4.509	34	3330
1900	4.566	45	4.549	37	4.544	36	4.543	34	3420
1950	4.611	51	4.586	40	4.580	37	4.577	36	3510
2000	4.662	57	4.626	44	4.617	40	4.613	39	3600
2050	4.719	62	4.670	45	4.657	42	4.652	40	3690
2100	4.781	75	4.715	52	4.699	45	4.692	42	3780
2150	4.856	91	4.767	56	4.744	47	4.734	46	3870
2200	4.947	108	4.823	67	4.791	59	4.780	53	3960
2250	5.055	124	4.890	79	4.850	68	4.833	60	4050
2300	5.179	142	4.969	87	4.918	72	4.893	63	4140
2350	5.321	163	5.056	93	4.990	77	4.956	70	4230
2400	5.484	186	5.149	106	5.067	85	5.026	76	4320
2450	5.670	212	5.255	118	5.152	95	5.102	84	4410
2500	5.882	24	5.373	134	5.247	106	5.186	96	4500
2550	6.12	28	5.507	154	5.353	121	5.282	107	4590
2600	6.40	31	5.661	170	5.474	133	5.389	117	4680
2650	6.71	35	5.831	188	5.607	146	5.506	128	4770
2700	7.06	39	6.019	228	5.753	159	5.634	141	4860
2750	7.45	42	6.247	208	5.912	176	5.775	155	4950
2800	7.87	48	6.455	253	6.088	194	5.930	176	5040
2850	8.35	51	6.708	285	6.282	215	6.106	194	5130
2900	8.86	54	6.993	297	6.497	236	6.300	208	5220
2950	9.40	56	7.290	315	6.733	258	6.508	216	5310
3000	9.96		7.605		6.991		6.724		5400

Table 2-3. SPECIFIC HEAT OF AIR - Cont. C_p/R

°K	10 atm		40 atm		70 atm		100 atm		°R
150	3.844	- 66							270
160	3.778	- 48	5.876	-784					288
170	3.730	- 37	5.092	-411					306
180	3.693	- 29	4.681	-255	6.621	-965	8.46	-148	324
190	3.664	- 21	4.426	-170	5.656	-524	6.98	- 90	342
200	3.643	- 19	4.256	-127	5.132	-342	6.079	- 601	360
210	3.624	- 14	4.129	- 93	4.790	-231	5.478	- 385	378
220	3.610	- 13	4.036	- 73	4.559	-167	5.093	- 272	396
230	3.597	- 10	3.963	- 57	4.392	-127	4.821	- 202	414
240	3.587	- 8	3.906	- 46	4.265	- 99	4.619	- 156	432
250	3.579	- 7	3.860	- 38	4.166	- 76	4.463	- 119	450
260	3.572	- 6	3.822	- 32	4.090	- 65	4.344	- 96	468
270	3.566	- 5	3.790	- 27	4.025	- 55	4.248	- 81	486
280	3.561	- 5	3.763	- 22	3.970	- 44	4.167	- 66	504
290	3.558	- 3	3.741	- 19	3.926	- 37	4.101	- 55	522
300	3.555	- 2	3.722	- 16	3.889	- 32	4.046	- 46	540
310	3.553	- 2	3.706	- 14	3.857	- 26	4.000	- 40	558
320	3.551	- 1	3.692	- 12	3.831	- 23	3.960	- 33	576
330	3.550		3.680	- 9	3.808	- 20	3.927	- 30	594
340	3.550		3.671	- 9	3.788	- 17	3.897	- 25	612
350	3.550	1	3.662	- 6	3.771	- 15	3.872	- 23	630
360	3.551	1	3.656	- 6	3.756	- 12	3.849	- 18	648
370	3.552	2	3.650	- 4	3.744	- 12	3.831	- 17	666
380	3.554	2	3.646	- 4	3.732	- 8	3.814	- 14	684
390	3.556	2	3.642	- 2	3.724	- 7	3.800	- 12	702
400	3.558	3	3.640	- 2	3.717	- 7	3.788	- 11	720
410	3.561	4	3.638	1	3.710	- 5	3.777	- 9	738
420	3.565	3	3.637		3.705	- 4	3.768	- 7	756
430	3.568	4	3.637		3.701	- 3	3.761	- 6	774
440	3.572	5	3.637	1	3.698	- 2	3.755	- 5	792
450	3.577	5	3.638	2	3.696	- 1	3.750	- 4	810
460	3.582	5	3.640	2	3.695		3.746	- 3	828
470	3.587	5	3.642	3	3.695		3.743	- 2	846
480	3.592	6	3.645	3	3.695		3.741	- 1	864
490	3.598	5	3.648	4	3.695	2	3.740	- 1	882
500	3.603	6	3.652	4	3.697	2	3.739		900
510	3.609	7	3.656	4	3.699	2	3.739	1	918
520	3.616	6	3.660	5	3.701	3	3.740	1	936
530	3.622	7	3.665	5	3.704	4	3.741	2	954
540	3.629	7	3.670	5	3.708	3	3.743	2	972
550	3.636	7	3.675	5	3.711	4	3.745	3	990
560	3.643	7	3.680	6	3.715	5	3.748	3	1008
570	3.650	8	3.686	6	3.720	4	3.751	4	1026
580	3.658	7	3.692	6	3.724	5	3.755	3	1044
590	3.665	8	3.698	7	3.729	6	3.758	5	1062
600	3.673	7	3.705	6	3.735	5	3.763	4	1080
610	3.680	8	3.711	7	3.740	6	3.767	5	1098
620	3.688	8	3.718	7	3.746	5	3.772	5	1116
630	3.696	8	3.725	7	3.751	6	3.777	5	1134
640	3.704	8	3.732	7	3.757	7	3.782	5	1152
650	3.712	8	3.739	7	3.764	6	3.787	6	1170
660	3.720	8	3.746	7	3.770	7	3.793	6	1188
670	3.728	8	3.753	7	3.777	6	3.799	5	1206
680	3.736	8	3.760	8	3.783	7	3.804	6	1224
690	3.744	9	3.768	7	3.790	7	3.810	7	1242
700	3.753		3.775		3.797		3.817		1260

Table 2-3. SPECIFIC HEAT OF AIR - Cont.

Cp/R

°K	10 atm		40 atm		70 atm		100 atm		°R
700	3.753	8	3.775	8	3.797	6	3.817	6	1260
710	3.761	8	3.783	7	3.803	7	3.823	6	1278
720	3.769	8	3.790	8	3.810	7	3.829	6	1296
730	3.777	8	3.798	7	3.817	7	3.835	7	1314
740	3.785	8	3.805	8	3.824	7	3.842	6	1332
750	3.793	8	3.813	7	3.831	7	3.848	6	1350
760	3.801	8	3.820	8	3.838	7	3.854	7	1368
770	3.809	8	3.828	7	3.845	7	3.861	7	1386
780	3.817	8	3.835	8	3.852	7	3.868	6	1404
790	3.825	9	3.843	8	3.859	8	3.874	8	1422
800	3.834	39	3.851	39	3.867	35	3.882	33	1440
850	3.873	37	3.890	34	3.902	34	3.915	32	1530
900	3.910	38	3.924	36	3.936	34	3.947	33	1620
950	3.948	35	3.960	33	3.970	33	3.980	32	1710
1000	3.983	33	3.993	32	4.003	31	4.012	30	1800
1050	4.016	33	4.025	32	4.034	31	4.042	30	1890
1100	4.049	32	4.057	31	4.065	30	4.072	31	1980
1150	4.081	30	4.088	30	4.095	30	4.103	27	2070
1200	4.111	31	4.118	30	4.125	29	4.130	29	2160
1250	4.142	31	4.148	31	4.154	30	4.159	30	2250
1300	4.173	30	4.179	29	4.184	29	4.189	28	2340
1350	4.203	29	4.208	28	4.213	28	4.217	28	2430
1400	4.232	29	4.236	30	4.241	29	4.245	28	2520
1450	4.261	29	4.266	28	4.270	28	4.273	29	2610
1500	4.290	30	4.294	30	4.298	29	4.302	29	2700
1550	4.320	31	4.324	30	4.327	30	4.331	30	2790
1600	4.351	31	4.354	31	4.357	31	4.361	30	2880
1650	4.382	32	4.385	31	4.388	31	4.391	30	2970
1700	4.414	31	4.416	31	4.419	30	4.421	30	3060
1750	4.445	33	4.447	30	4.449	30	4.451	30	3150
1800	4.478	31	4.477	31	4.479	30	4.481	30	3240
1850	4.509	34	4.508	32	4.509	31	4.511	31	3330
1900	4.543	34	4.540	31	4.540	32	4.542	31	3420
1950	4.577	36	4.571	32	4.572	32	4.573	32	3510
2000	4.613	39	4.603	35	4.604	33	4.605	33	3600
2050	4.652	40	4.638	36	4.637	33	4.638	33	3690
2100	4.692	42	4.674	35	4.670	33	4.671	31	3780
2150	4.734	46	4.709	36	4.703	35	4.702	32	3870
2200	4.780	53	4.745	40	4.738	37	4.734	35	3960
2250	4.833	60	4.785	43	4.775	39	4.769	37	4050
2300	4.893	63	4.828	46	4.814	41	4.806	39	4140
2350	4.956	70	4.874	48	4.855	42	4.845	41	4230
2400	5.026	76	4.922	51	4.897	44	4.886	42	4320
2450	5.102	84	4.973	55	4.941	46	4.928	43	4410
2500	5.186	96	5.028	59	4.987	49	4.971	45	4500
2550	5.282	107	5.087	65	5.036	52	5.016	46	4590
2600	5.389	117	5.152	68	5.088	55	5.062	53	4680
2650	5.506	128	5.220	75	5.143	60	5.115	57	4770
2700	5.634	141	5.295	82	5.203	67	5.172	61	4860
2750	5.775	155	5.377	90	5.270	71	5.233	64	4950
2800	5.930	176	5.467	96	5.341	75	5.297	66	5040
2850	6.106	194	5.563	105	5.416	80	5.363	71	5130
2900	6.300	208	5.668	114	5.496	87	5.434	78	5220
2950	6.508	216	5.782	124	5.583	95	5.512	90	5310
3000	6.724		5.906		5.678		5.602		5400

Table 2-4. ENTHALPY OF AIR* $(H-E_0^o)/RT_0$

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
50	.6346	1279							90
60	.7625	1280							108
70	.8905	1280							126
80	1.0185	1279	1.0160	1284					144
90	1.1464	1278	1.1444	1281	1.1376	1291	1.1307	1304	162
100	1.2742	1279	1.2725	1281	1.2667	1291	1.2611	1298	180
110	1.4021	1278	1.4006	1280	1.3958	1286	1.3909	1293	198
120	1.5299	1278	1.5286	1280	1.5244	1286	1.5202	1291	216
130	1.6577	1278	1.6566	1279	1.6530	1283	1.6493	1288	234
140	1.7855	1278	1.7845	1279	1.7813	1282	1.7781	1285	252
150	1.9133	1279	1.9124	1280	1.9095	1283	1.9066	1286	270
160	2.0412	1278	2.0404	1279	2.0378	1281	2.0352	1284	288
170	2.1690	1278	2.1683	1279	2.1659	1281	2.1636	1283	306
180	2.2968	1278	2.2962	1278	2.2940	1281	2.2919	1282	324
190	2.4246	1279	2.4240	1280	2.4221	1281	2.4201	1282	342
200	2.5525	1279	2.5520	1278	2.5502	1280	2.5483	1282	360
210	2.6804	1279	2.6798	1280	2.6782	1280	2.6765	1282	378
220	2.8083	1279	2.8078	1279	2.8062	1280	2.8047	1281	396
230	2.9362	1279	2.9357	1280	2.9342	1281	2.9328	1282	414
240	3.0641	1279	3.0637	1279	3.0623	1281	3.0610	1281	432
250	3.1920	1279	3.1916	1279	3.1904	1280	3.1891	1281	450
260	3.3199	1280	3.3195	1280	3.3184	1281	3.3172	1282	468
270	3.4479	1280	3.4475	1281	3.4465	1281	3.4454	1282	486
280	3.5759	1281	3.5756	1281	3.5746	1282	3.5736	1282	504
290	3.7040	1281	3.7037	1281	3.7028	1281	3.7018	1283	522
300	3.8321	1282	3.8318	1282	3.8309	1283	3.8301	1283	540
310	3.9603	1282	3.9600	1283	3.9592	1283	3.9584	1283	558
320	4.0885	1284	4.0883	1284	4.0875	1284	4.0867	1285	576
330	4.2169	1284	4.2167	1284	4.2159	1285	4.2152	1286	594
340	4.3453	1285	4.3451	1285	4.3444	1286	4.3438	1286	612
350	4.4738	1286	4.4736	1286	4.4730	1286	4.4724	1287	630
360	4.6024	1288	4.6022	1288	4.6016	1289	4.6011	1288	648
370	4.7312	1289	4.7310	1289	4.7305	1289	4.7299	1290	666
380	4.8601	1290	4.8599	1290	4.8594	1291	4.8589	1291	684
390	4.9891	1291	4.9889	1291	4.9885	1291	4.9880	1292	702
400	5.1182	1294	5.1180	1295	5.1176	1294	5.1172	1294	720
410	5.2476	1295	5.2475	1295	5.2470	1296	5.2466	1296	738
420	5.3771	1296	5.3770	1296	5.3766	1296	5.3762	1297	756
430	5.5067	1299	5.5066	1299	5.5062	1300	5.5059	1299	774
440	5.6366	1301	5.6365	1301	5.6362	1301	5.6358	1302	792
450	5.7667	1302	5.7666	1302	5.7663	1302	5.7660	1302	810
460	5.8969	1305	5.8968	1305	5.8965	1305	5.8962	1305	828
470	6.0274	1307	6.0273	1307	6.0270	1307	6.0267	1307	846
480	6.1581	1310	6.1580	1310	6.1577	1311	6.1574	1311	864
490	6.2891	1311	6.2890	1311	6.2888	1311	6.2885	1312	882
500	6.4202	1315	6.4201	1316	6.4199	1316	6.4197	1315	900
510	6.5517	1316	6.5517	1316	6.5515	1316	6.5512	1318	918
520	6.6833	1320	6.6833	1320	6.6831	1320	6.6830	1320	936
530	6.8153	1322	6.8153	1322	6.8151	1322	6.8150	1322	954
540	6.9475	1324	6.9475	1324	6.9473	1325	6.9472	1324	972
550	7.0799	1328	7.0799	1328	7.0798	1328	7.0796	1328	990
560	7.2127	1330	7.2127	1330	7.2126	1330	7.2124	1331	1008
570	7.3457	1333	7.3457	1333	7.3456	1333	7.3455	1333	1026
580	7.4790	1336	7.4790	1336	7.4789	1336	7.4788	1337	1044
590	7.6126	1339	7.6126	1339	7.6125	1339	7.6125	1339	1062
600	7.7465	1342	7.7465	1342	7.7464	1343	7.7464	1342	1080
610	7.8807	1345	7.8807	1345	7.8807	1344	7.8806	1345	1098
620	8.0152	1348	8.0152	1348	8.0151	1349	8.0151	1348	1116
630	8.1500	1351	8.1500	1351	8.1500	1351	8.1499	1352	1134
640	8.2851	1354	8.2851	1354	8.2851	1354	8.2851	1354	1152
650	8.4205		8.4205		8.4205		8.4205		1170

* The enthalpy function is divided here by a constant RT_0 where $T_0 = 273.16^oK$ (491.688 ^oR).

Table 2-4. ENTHALPY OF AIR - Cont.* $(H-E_0^o)/RT_0$

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
650	8.4205	1357	8.4205	1357	8.4205	1357	8.4205	1357	1170
660	8.5562	1360	8.5562	1360	8.5562	1360	8.5562	1360	1188
670	8.6922	1363	8.6922	1363	8.6922	1363	8.6922	1363	1206
680	8.8285	1366	8.8285	1366	8.8285	1366	8.8285	1367	1224
690	8.9651	1370	8.9651	1370	8.9651	1371	8.9652	1370	1242
700	9.1021	1372	9.1021	1372	9.1022	1372	9.1022	1372	1260
710	9.2393	1375	9.2393	1375	9.2394	1375	9.2394	1375	1278
720	9.3768	1379	9.3768	1379	9.3769	1379	9.3769	1380	1296
730	9.5147	1381	9.5147	1381	9.5148	1380	9.5149	1380	1314
740	9.6528	1385	9.6528	1385	9.6528	1386	9.6529	1386	1332
750	9.7913	1388	9.7913	1388	9.7914	1388	9.7915	1389	1350
760	9.9301	1391	9.9301	1391	9.9302	1391	9.9304	1391	1368
770	10.0692	1393	10.0692	1393	10.0693	1393	10.0695	1392	1386
780	10.2085	1397	10.2085	1397	10.2086	1397	10.2087	1398	1404
790	10.3482	140	10.3482	140	10.3483	140	10.3485	140	1422
800	10.488	704	10.488	704	10.488	704	10.488	704	1440
850	11.192	712	11.192	712	11.192	712	11.192	712	1530
900	11.904	719	11.904	719	11.904	719	11.904	719	1620
950	12.623	725	12.623	725	12.623	725	12.623	725	1710
1000	13.348	731	13.348	731	13.348	731	13.348	731	1800
1050	14.079	738	14.079	738	14.079	738	14.079	738	1890
1100	14.817	744	14.817	744	14.817	744	14.817	744	1980
1150	15.561	749	15.561	749	15.561	749	15.561	749	2070
1200	16.310	755	16.310	755	16.310	755	16.310	755	2160
1250	17.065	761	17.065	761	17.065	761	17.065	761	2250
1300	17.826	766	17.826	766	17.826	766	17.826	766	2340
1350	18.592	772	18.592	771	18.592	771	18.592	771	2430
1400	19.364	778	19.363	777	19.363	777	19.363	777	2520
1450	20.142	784	20.140	782	20.140	782	20.140	782	2610
1500	20.926	791	20.922	788	20.922	788	20.922	788	2700
1550	21.717	798	21.710	794	21.710	794	21.710	794	2790
1600	22.515	806	22.504	801	22.504	800	22.504	800	2880
1650	23.321	815	23.305	808	23.304	806	23.304	806	2970
1700	24.136	826	24.113	815	24.110	812	24.110	812	3060
1750	24.962	840	24.928	823	24.922	819	24.922	818	3150
1800	25.802	858	25.751	833	25.741	827	25.740	825	3240
1850	26.660	881	26.584	844	26.568	835	26.565	833	3330
1900	27.541	911	27.428	858	27.403	845	27.398	841	3420
1950	28.452	951	28.286	876	28.248	856	28.239	851	3510
2000	29.403	1005	29.162	897	29.104	869	29.090	861	3600
2050	30.408	1077	30.059	920	29.973	883	29.951	873	3690
2100	31.485	1164	30.979	949	30.856	900	30.824	887	3780
2150	32.649	1264	31.928	985	31.756	921	31.711	904	3870
2200	33.913	1379	32.913	1030	32.677	946	32.615	925	3960
2250	35.292	1504	33.943	1085	33.623	977	33.540	949	4050
2300	36.796		35.028	1148	34.600	1011	34.489	977	4140
2350			36.176	1220	35.611	1050	35.466	1008	4230
2400			37.396	1308	36.661	1097	36.474	1045	4320
2450			38.704	1412	37.758	1151	37.519	1087	4410
2500			40.116	1520	38.909	1212	38.606	1133	4500
2550			41.636	1645	40.121	1276	39.739	1182	4590
2600			43.281	1797	41.397	1348	40.921	1236	4680
2650			45.078	1951	42.745	1426	42.157	1296	4770
2700			47.029	2120	44.171	1511	43.453	1363	4860
2750			49.149	2301	45.682	1603	44.816	1432	4950
2800			51.450		47.285		46.248		5040

* The enthalpy function is divided here by a constant RT_0 where $T_0 = 273.16°K$ (491.688 °R).

Table 2-4. ENTHALPY OF AIR - Cont.* $(H-E_0^o)/RT_0$

°K	1 atm		4 atm		7 atm		10 atm		°R
100	1.2552	1307							180
110	1.3859	1297	1.3331	1381	1.2731	1489	1.2013	1661	198
120	1.5156	1299	1.4712	1355	1.4220	1433	1.3674	1545	216
130	1.6455	1291	1.6067	1343	1.5653	1404	1.5219	1461	234
140	1.7746	1290	1.7410	1326	1.7057	1364	1.6680	1432	252
150	1.9036	1289	1.8736	1320	1.8421	1355	1.8112	1390	270
160	2.0325	1287	2.0056	1313	1.9776	1342	1.9502	1369	288
170	2.1612	1285	2.1369	1308	2.1118	1332	2.0871	1355	306
180	2.2897	1284	2.2677	1303	2.2450	1325	2.2226	1345	324
190	2.4181	1284	2.3980	1301	2.3775	1319	2.3571	1337	342
200	2.5465	1283	2.5281	1298	2.5094	1314	2.4908	1330	360
210	2.6748	1283	2.6579	1296	2.6408	1310	2.6238	1324	378
220	2.8031	1283	2.7875	1294	2.7718	1307	2.7562	1319	396
230	2.9314	1283	2.9169	1293	2.9025	1304	2.8881	1315	414
240	3.0597	1282	3.0462	1292	3.0329	1302	3.0196	1312	432
250	3.1879	1282	3.1754	1291	3.1631	1300	3.1508	1309	450
260	3.3161	1282	3.3045	1290	3.2931	1298	3.2817	1307	468
270	3.4443	1283	3.4335	1290	3.4229	1297	3.4124	1305	486
280	3.5726	1283	3.5625	1290	3.5526	1296	3.5429	1303	504
290	3.7009	1283	3.6915	1289	3.6822	1296	3.6732	1302	522
300	3.8292	1284	3.8204	1290	3.8118	1295	3.8034	1301	540
310	3.9576	1284	3.9494	1290	3.9413	1295	3.9335	1300	558
320	4.0860	1285	4.0784	1290	4.0708	1295	4.0635	1300	576
330	4.2145	1286	4.2074	1290	4.2003	1295	4.1935	1300	594
340	4.3431	1286	4.3364	1291	4.3298	1295	4.3235	1300	612
350	4.4717	1288	4.4655	1292	4.4593	1296	4.4535	1300	630
360	4.6005	1291	4.5947	1293	4.5889	1296	4.5835	1300	648
370	4.7296	1288	4.7240	1294	4.7185	1297	4.7135	1301	666
380	4.8584	1291	4.8534	1295	4.8482	1298	4.8436	1301	684
390	4.9875	1292	4.9829	1296	4.9780	1299	4.9737	1302	702
400	5.1167	1295	5.1125	1297	5.1079	1300	5.1039	1303	720
410	5.2462	1296	5.2422	1299	5.2379	1302	5.2342	1304	738
420	5.3758	1297	5.3721	1300	5.3681	1303	5.3646	1306	756
430	5.5055	1300	5.5021	1301	5.4984	1304	5.4952	1307	774
440	5.6355	1302	5.6322	1304	5.6288	1306	5.6259	1308	792
450	5.7657	1302	5.7626	1306	5.7594	1308	5.7567	1310	810
460	5.8959	1306	5.8932	1308	5.8902	1310	5.8877	1312	828
470	6.0265	1306	6.0240	1310	5.0212	1312	6.0189	1314	846
480	6.1571	1312	6.1550	1312	5.1524	1314	6.1503	1316	864
490	6.2883	1312	6.2862	1314	5.2838	1316	6.2819	1318	882
500	6.4195	1315	6.4176	1316	6.4154	1319	6.4137	1320	900
510	6.5510	1318	6.5492	1319	6.5473	1321	6.5457	1322	918
520	6.6828	1320	6.6811	1322	6.6794	1323	6.6779	1325	936
530	6.8148	1322	6.8133	1324	6.8117	1326	6.8104	1327	954
540	6.9470	1325	6.9457	1327	6.9443	1328	6.9431	1330	972
550	7.0795	1328	7.0784	1329	7.0771	1331	7.0761	1332	990
560	7.2123	1331	7.2113	1332	7.2102	1334	7.2093	1335	1008
570	7.3454	1333	7.3445	1335	7.3436	1337	7.3428	1338	1026
580	7.4787	1337	7.4780	1338	7.4773	1339	7.4766	1340	1044
590	7.6124	1339	7.6118	1341	7.6112	1342	7.6106	1343	1062
600	7.7463	1342	7.7459	1344	7.7454	1345	7.7449	1346	1080
610	7.8805	1345	7.8803	1347	7.8799	1348	7.8795	1349	1098
620	8.0150	1349	8.0150	1349	8.0147	1351	8.0144	1352	1116
630	8.1499	1352	8.1499	1352	8.1498	1354	8.1496	1354	1134
640	8.2851	1354	8.2851	1355	8.2852	1357	8.2850	1357	1152
650	8.4205	1357	8.4206	1358	8.4209	1360	8.4207	1360	1170
660	8.5562	1360	8.5564	1361	8.5569	1362	8.5567	1363	1188
670	8.6922	1363	8.6925	1364	8.6931	1365	8.6930	1366	1206
680	8.8285	1367	8.8289	1367	8.8296	1368	8.8296	1369	1224
690	8.9652	1371	8.9656	1371	8.9664	1371	8.9665	1372	1242
700	9.1023		9.1027		9.1035		9.1037		1260

* The enthalpy function is divided here by a constant RT_0 where $T_0 = 273.16^oK$ (491.688 ^oR).

Table 2-4. ENTHALPY OF AIR - Cont.* $(H-E_0^o)/RT$

°K	1 atm		4 atm		7 atm		10 atm		°R
700	9.1023	1372	9.1027	1374	9.1035	1374	9.1037	1375	1260
710	9.2395	1375	9.2401	1377	9.2409	1377	9.2412	1378	1278
720	9.3770	1380	9.3778	1380	9.3786	1380	9.3790	1381	1296
730	9.5150	1380	9.5158	1383	9.5166	1383	9.5171	1384	1314
740	9.6530	1386	9.6541	1386	9.6549	1386	9.6555	1387	1332
750	9.7916	1389	9.7927	1389	9.7935	1389	9.7942	1390	1350
760	9.9305	1391	9.9316	1392	9.9324	1392	9.9332	1393	1368
770	10.0696	1392	10.0708	1395	10.0716	1395	10.0725	1396	1386
780	10.2088	1398	10.2103	1398	10.2111	1398	10.2121	1399	1404
790	10.3486	140	10.3501	140	10.3509	140	10.3520	140	1422
800	10.489	703	10.490	702	10.491	705	10.492	705	1440
850	11.192	712	11.192	714	11.196	712	11.197	712	1530
900	11.904	719	11.906	719	11.908	719	11.909	719	1620
950	12.623	725	12.625	725	12.627	725	12.628	726	1710
1000	13.348	731	13.350	731	13.352	732	13.354	732	1800
1050	14.079	738	14.081	738	14.084	738	14.086	738	1890
1100	14.817	744	14.819	744	14.822	744	14.824	744	1980
1150	15.561	749	15.563	749	15.566	750	15.568	750	2070
1200	16.310	755	16.312	755	16.316	755	16.318	755	2160
1250	17.065	761	17.067	761	17.071	761	17.073	761	2250
1300	17.826	766	17.828	766	17.832	766	17.834	767	2340
1350	18.592	771	18.594	771	18.598	772	18.601	772	2430
1400	19.363	777	19.365	777	19.370	777	19.373	777	2520
1450	20.140	782	20.142	782	20.147	782	20.150	782	2610
1500	20.922	788	20.924	788	20.929	788	20.932	788	2700
1550	21.710	794	21.712	794	21.717	794	21.720	794	2790
1600	22.504	800	22.506	800	22.511	799	22.514	799	2880
1650	23.304	806	23.306	806	23.310	806	23.313	805	2970
1700	24.110	812	24.112	811	24.116	811	24.118	811	3060
1750	24.922	818	24.923	817	24.927	817	24.929	817	3150
1800	25.740	825	25.740	823	25.744	822	25.746	822	3240
1850	26.565	832	26.563	829	26.566	828	26.568	828	3330
1900	27.397	840	27.392	836	27.394	835	27.396	835	3420
1950	28.237	849	28.228	843	28.229	841	28.231	841	3510
2000	29.086	858	29.071	851	29.070	848	29.072	848	3600
2050	29.944	869	29.922	859	29.918	856	29.920	855	3690
2100	30.813	882	30.781	868	30.774	864	30.775	863	3780
2150	31.695	897	31.649	878	31.638	872	31.638	871	3870
2200	32.592	915	32.527	889	32.510	882	32.509	880	3960
2250	33.507	936	33.416	902	33.392	894	33.389	890	4050
2300	34.443	961	34.318	917	34.286	901	34.279	901	4140
2350	35.404	989	35.235	934	35.187	920	35.180	913	4230
2400	36.393	1020	36.169	952	36.107	935	36.093	927	4320
2450	37.413	1057	37.121	972	37.042	952	37.020	941	4410
2500	38.470	1098	38.093	995	37.994	970	37.961	958	4500
2550	39.568	1145	39.088	1022	38.964	991	38.919	976	4590
2600	40.713	1199	40.110	1052	39.955	1014	39.895	997	4680
2650	41.912	1260	41.162	1084	40.969	1039	40.892	1019	4770
2700	43.172	1327	42.246	1119	42.008	1067	41.911	1044	4860
2750	44.499	1402	43.365	1163	43.075	1098	42.955	1071	4950
2800	45.901	1484	44.528	1204	44.173	1132	44.026	1101	5040
2850	47.385	1575	45.732	1253	45.305	1169	45.127	1135	5130
2900	48.960	1671	46.985	1307	46.474	1211	46.262	1173	5220
2950	50.631	1772	48.292	1363	47.685	1255	47.435	1215	5310
3000	52.403		49.655		48.940		48.650		5400

*The enthalpy function is divided here by a constant RT_0 where $T_0 = 273.16^oK$ (491.688 ^oR).

Table 2-4. ENTHALPY OF AIR - Cont.*

$(H-E_0^o)/RT_0$

°K	10 atm		40 atm		70 atm		100 atm		°R
150	1.8112	1390							270
160	1.9502	1369	1.5895	1992					288
170	2.0871	1355	1.7887	1784					306
180	2.2226	1345	1.9671	1663	1.6603	2225	1.3546	2815	324
190	2.3571	1337	2.1334	1588	1.8828	1966	1.6361	2373	342
200	2.4908	1330	2.2922	1539	2.0794	1811	1.8734	2104	360
210	2.6238	1324	2.4455	1494	2.2605	1710	2.0838	1933	378
220	2.7562	1319	2.5949	1464	2.4315	1637	2.2771	1812	396
230	2.8881	1315	2.7413	1439	2.5952	1588	2.4583	1736	414
240	3.0196	1312	2.8852	1422	2.7540	1538	2.6319	1653	432
250	3.1508	1309	3.0274	1403	2.9078	1489	2.7972	1608	450
260	3.2817	1307	3.1677	1390	3.0567	1492	2.9580	1576	468
270	3.4124	1305	3.3067	1387	3.2059	1477	3.1156	1539	486
280	3.5429	1303	3.4454	1375	3.3536	1449	3.2695	1516	504
290	3.6732	1302	3.5829	1365	3.4985	1426	3.4211	1488	522
300	3.8034	1301	3.7194	1360	3.6411	1415	3.5699	1474	540
310	3.9335	1300	3.8554	1355	3.7826	1407	3.7173	1459	558
320	4.0635	1300	3.9909	1349	3.9233	1399	3.8632	1446	576
330	4.1935	1300	4.1258	1345	4.0632	1391	4.0078	1434	594
340	4.3235	1300	4.2603	1341	4.2023	1384	4.1512	1423	612
350	4.4535	1300	4.3944	1337	4.3407	1376	4.2935	1413	630
360	4.5835	1300	4.5281	1337	4.4783	1373	4.4348	1405	648
370	4.7135	1301	4.6618	1336	4.6156	1368	4.5753	1397	666
380	4.8436	1301	4.7954	1335	4.7524	1366	4.7150	1390	684
390	4.9737	1302	4.9289	1334	4.8890	1362	4.8540	1386	702
400	5.1039	1303	5.0623	1333	5.0252	1360	4.9926	1385	720
410	5.2342	1304	5.1956	1333	5.1612	1358	5.1311	1381	738
420	5.3646	1306	5.3289	1332	5.2970	1355	5.2692	1379	756
430	5.4952	1307	5.4621	1331	5.4325	1355	5.4071	1375	774
440	5.6259	1308	5.5952	1330	5.5680	1353	5.5446	1374	792
450	5.7567	1310	5.7282	1331	5.7033	1353	5.6820	1372	810
460	5.8877	1312	5.8613	1332	5.8386	1352	5.8192	1371	828
470	6.0189	1314	5.9945	1334	5.9738	1352	5.9563	1370	846
480	6.1503	1316	6.1279	1335	6.1090	1352	6.0933	1369	864
490	6.2819	1318	6.2614	1337	6.2442	1353	6.2302	1368	882
500	6.4137	1320	6.3951	1338	6.3795	1354	6.3670	1368	900
510	6.5457	1322	6.5289	1339	6.5149	1355	6.5038	1370	918
520	6.6779	1325	6.6628	1341	6.6504	1356	6.6408	1369	936
530	6.8104	1327	6.7969	1342	6.7860	1358	6.7777	1371	954
540	6.9431	1330	6.9311	1344	6.9218	1357	6.9148	1370	972
550	7.0761	1332	7.0655	1347	7.0575	1361	7.0518	1373	990
560	7.2093	1335	7.2002	1348	7.1936	1360	7.1891	1373	1008
570	7.3428	1338	7.3350	1350	7.3296	1362	7.3264	1373	1026
580	7.4766	1340	7.4700	1353	7.4658	1364	7.4637	1376	1044
590	7.6106	1343	7.6053	1355	7.6022	1366	7.6013	1377	1062
600	7.7449	1346	7.7408	1357	7.7388	1369	7.7390	1379	1080
610	7.8795	1349	7.8765	1360	7.8757	1370	7.8769	1380	1098
620	8.0144	1352	8.0125	1363	8.0127	1372	8.0149	1382	1116
630	8.1496	1354	8.1488	1365	8.1499	1375	8.1531	1383	1134
640	8.2850	1357	8.2853	1367	8.2874	1377	8.2914	1384	1152
650	8.4207	1360	8.4220	1370	8.4251	1379	8.4298	1386	1170
660	8.5567	1363	8.5590	1373	8.5630	1381	8.5684	1389	1188
670	8.6930	1366	8.6963	1375	8.7011	1384	8.7073	1391	1206
680	8.8296	1369	8.8338	1378	8.8395	1385	8.8464	1394	1224
690	8.9665	1372	8.9716	1380	8.9780	1388	8.9858	1395	1242
700	9.1037		9.1096		9.1168		9.1253		1260

* The enthalpy function is divided here by a constant RT_0 where T_0 = 273.16 °K (491.688 °R).

Table 2-4. ENTHALPY OF AIR - Cont.* $(H-E_0^\circ)/RT_0$

°K	10 atm		40 atm		70 atm		100 atm		°R
700	9.1037	1375	9.1096	1383	9.1168	1391	9.1253	1402	1260
710	9.2412	1378	9.2479	1386	9.2559	1393	9.2655	1403	1278
720	9.3790	1381	9.3865	1389	9.3952	1397	9.4058	1405	1296
730	9.5171	1384	9.5254	1392	9.5349	1399	9.5463	1407	1314
740	9.6555	1387	9.6646	1394	9.6748	1401	9.6870	1408	1332
750	9.7942	1390	9.8040	1397	9.8149	1404	9.8278	1410	1350
760	9.9332	1393	9.9437	1400	9.9553	1406	9.9688	1411	1368
770	10.0725	1396	10.0837	1403	10.0959	1409	10.1099	1413	1386
780	10.2121	1399	10.2240	1405	10.2368	1411	10.2512	1414	1404
790	10.3520	140	10.3645	140	10.3779	141	10.3926	141	1422
800	10.492	705	10.505	708	10.519	711	10.534	714	1440
850	11.197	712	11.213	715	11.230	717	11.248	720	1530
900	11.909	719	11.928	721	11.947	723	11.968	725	1620
950	12.628	726	12.649	728	12.670	730	12.693	731	1710
1000	13.354	732	13.377	734	13.400	736	13.424	737	1800
1050	14.086	738	14.111	740	14.136	741	14.161	743	1890
1100	14.824	744	14.851	745	14.877	747	14.904	748	1980
1150	15.568	750	15.596	751	15.624	752	15.652	753	2070
1200	16.318	755	16.347	757	16.376	758	16.405	759	2160
1250	17.073	761	17.104	762	17.134	763	17.164	764	2250
1300	17.834	767	17.866	768	17.897	769	17.928	769	2340
1350	18.601	772	18.634	773	18.666	774	18.697	774	2430
1400	19.373	777	19.407	778	19.440	779	19.471	780	2520
1450	20.150	782	20.185	783	20.219	784	20.251	785	2610
1500	20.932	788	20.968	789	21.003	789	21.036	790	2700
1550	21.720	794	21.757	794	21.792	795	21.826	795	2790
1600	22.514	799	22.551	800	22.587	800	22.621	801	2880
1650	23.313	805	23.351	805	23.387	806	23.422	806	2970
1700	24.118	811	24.156	811	24.193	811	24.228	812	3060
1750	24.929	817	24.967	817	25.004	817	25.040	817	3150
1800	25.746	822	25.784	822	25.821	823	25.857	823	3240
1850	26.568	828	26.606	828	26.644	828	26.680	829	3330
1900	27.396	835	27.434	834	27.472	834	27.509	834	3420
1950	28.231	841	28.268	840	28.306	840	28.343	840	3510
2000	29.072	848	29.108	846	29.146	846	29.183	846	3600
2050	29.920	855	29.954	852	29.992	852	30.029	852	3690
2100	30.775	863	30.806	859	30.844	858	30.881	858	3780
2150	31.638	871	31.665	865	31.702	864	31.739	864	3870
2200	32.509	880	32.530	872	32.566	871	32.603	870	3960
2250	33.389	890	33.402	880	33.437	878	33.473	876	4050
2300	34.279	901	34.282	888	34.315	885	34.349	883	4140
2350	35.180	913	35.170	897	35.200	892	35.232	891	4230
2400	36.093	927	36.067	906	36.092	900	36.123	898	4320
2450	37.020	941	36.973	915	36.992	909	37.021	906	4410
2500	37.961	958	37.888	925	37.901	917	37.927	914	4500
2550	38.919	976	38.813	937	38.818	926	38.841	923	4590
2600	39.895	997	39.750	949	39.744	936	39.764	932	4680
2650	40.892	1019	40.699	962	40.680	947	40.696	942	4770
2700	41.911	1044	41.661	977	41.627	958	41.638	952	4860
2750	42.955	1071	42.638	992	42.585	971	42.590	964	4950
2800	44.026	1101	43.630	1009	43.556	984	43.554	976	5040
2850	45.127	1135	44.639	1027	44.540	999	44.530	988	5130
2900	46.262	1173	45.666	1048	45.539	1014	45.518	1002	5220
2950	47.435	1215	46.714	1070	46.553	1030	46.520	1017	5310
3000	48.650		47.784		47.583		47.537		5400

* The enthalpy function is divided here by a constant RT_0 where $T_0 = 273.16^\circ K$ (491.688 °R).

Table 2-5. ENTROPY OF AIR

S/R

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
50	22.266	637							90
60	22.903	538							108
70	23.441	467							126
80	23.908	411	21.600	414					144
90	24.319	370	22.014	368	20.613	373	20.032	384	162
100	24.689	331	22.382	333	20.986	335	20.416	338	180
110	25.020	304	22.715	305	21.321	306	20.754	307	198
120	25.324	279	23.020	279	21.627	281	21.061	282	216
130	25.603	259	23.299	259	21.908	260	21.343	261	234
140	25.862	241	23.558	241	22.168	242	21.604	242	252
150	26.103	225	23.799	226	22.410	226	21.846	227	270
160	26.328	212	24.025	212	22.636	212	22.073	213	288
170	26.540	200	24.237	199	22.848	200	22.286	200	306
180	26.740	189	24.436	189	23.048	189	22.486	189	324
190	26.929	179	24.625	179	23.237	179	22.675	180	342
200	27.108	170	24.804	171	23.416	171	22.855	171	360
210	27.278	162	24.975	163	23.587	163	23.026	163	378
220	27.440	156	25.138	155	23.750	155	23.189	155	396
230	27.596	149	25.293	149	23.905	149	23.344	149	414
240	27.745	142	25.442	142	24.054	143	23.493	143	432
250	27.887	137	25.584	137	24.197	137	23.636	138	450
260	28.024	132	25.721	132	24.334	132	23.774	132	468
270	28.156	127	25.853	127	24.466	127	23.906	127	486
280	28.283	123	25.980	123	24.593	123	24.033	123	504
290	28.406	119	26.103	119	24.716	119	24.156	119	522
300	28.525	115	26.222	115	24.835	115	24.275	115	540
310	28.640	111	26.337	111	24.950	111	24.390	111	558
320	28.751	108	26.448	108	25.061	108	24.501	108	576
330	28.859	105	26.556	105	25.169	105	24.609	105	594
340	28.964	101	26.661	102	25.274	102	24.714	102	612
350	29.065	99	26.763	99	25.376	99	24.816	99	630
360	29.164	96	26.862	96	25.475	96	24.915	96	648
370	29.260	94	26.958	94	25.571	94	25.011	94	666
380	29.354	92	27.052	92	25.665	92	25.105	92	684
390	29.446	89	27.144	89	25.757	89	25.197	89	702
400	29.535	87	27.233	87	25.846	87	25.286	87	720
410	29.622	85	27.320	85	25.933	85	25.373	85	738
420	29.707	84	27.405	83	26.018	83	25.458	83	756
430	29.791	82	27.488	82	26.101	82	25.541	82	774
440	29.873	80	27.570	80	26.183	80	25.623	80	792
450	29.953	78	27.650	78	26.263	78	25.703	78	810
460	30.031	76	27.728	77	26.341	77	25.781	77	828
470	30.107	75	27.805	75	26.418	75	25.858	75	846
480	30.182	74	27.880	74	26.493	74	25.933	74	864
490	30.256	73	27.954	72	26.567	73	26.007	73	882
500	30.329	71	28.026	71	26.640	71	26.080	71	900
510	30.400	70	28.097	70	26.711	70	26.151	70	918
520	30.470	68	28.167	69	26.781	68	26.221	68	936
530	30.538	68	28.236	67	26.849	68	26.289	68	954
540	30.606	66	28.303	66	26.917	66	26.357	66	972
550	30.672	66	28.369	65	26.983	65	26.423	66	990
560	30.738	64	28.434	65	27.048	65	26.489	64	1008
570	30.802	63	28.499	64	27.113	63	26.553	63	1026
580	30.865	62	28.563	62	27.176	62	26.616	63	1044
590	30.927	62	28.625	61	27.238	62	26.679	61	1062
600	30.989	61	28.686	61	27.300	61	26.740	61	1080
610	31.050	60	28.747	60	27.361	59	26.801	60	1098
620	31.110	59	28.807	59	27.420	59	26.861	59	1116
630	31.169	58	28.866	58	27.479	58	26.920	58	1134
640	31.227	57	28.924	57	27.537	57	26.978	57	1152
650	31.284		28.981		27.594		27.035		1170

Table 2-5. ENTROPY OF AIR - Cont.

S/R

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
650	31.284	56	28.981	57	27.594	57	27.035	57	1170
660	31.340	56	29.038	56	27.651	56	27.092	56	1188
670	31.396	55	29.094	55	27.707	55	27.148	55	1206
680	31.451	55	29.149	54	27.762	55	27.203	54	1224
690	31.506	54	29.203	54	27.817	54	27.257	54	1242
700	31.560	53	29.257	53	27.871	53	27.311	53	1260
710	31.613	52	29.310	53	27.924	52	27.364	53	1278
720	31.665	52	29.363	52	27.976	52	27.417	52	1296
730	31.717	51	29.415	51	28.028	51	27.469	51	1314
740	31.768	51	29.466	51	28.079	51	27.520	51	1332
750	31.819	50	29.517	50	28.130	50	27.571	50	1350
760	31.869	50	29.567	50	28.180	50	27.621	50	1368
770	31.919	49	29.617	49	28.230	49	27.671	49	1386
780	31.968	49	29.666	48	28.279	49	27.720	49	1404
790	32.017	48	29.714	48	28.328	48	27.769	48	1422
800	32.065	234	29.762	234	28.376	234	27.817	233	1440
850	32.299	222	29.996	222	28.610	222	28.050	222	1530
900	32.521	212	30.218	212	28.832	212	28.272	212	1620
950	32.733	203	30.430	203	29.044	203	28.484	203	1710
1000	32.936	195	30.633	195	29.247	195	28.687	195	1800
1050	33.131	187	30.828	188	29.442	188	28.882	188	1890
1100	33.318	181	31.016	181	29.630	181	29.070	181	1980
1150	33.499	175	31.197	174	29.811	174	29.251	174	2070
1200	33.674	168	31.371	168	29.985	168	29.425	168	2160
1250	33.842	163	31.539	163	30.153	163	29.593	163	2250
1300	34.005	158	31.702	158	30.316	158	29.756	158	2340
1350	34.163	153	31.860	153	30.474	153	29.914	153	2430
1400	34.316	149	32.013	149	30.627	149	30.067	149	2520
1450	34.465	145	32.162	145	30.776	145	30.216	145	2610
1500	34.610	141	32.307	141	30.921	141	30.361	141	2700
1550	34.751	138	32.448	138	31.062	138	30.502	138	2790
1600	34.889	135	32.586	135	31.200	134	30.640	134	2880
1650	35.024	133	32.721	132	31.334	131	30.774	131	2970
1700	35.157	131	32.853	129	31.465	129	30.905	129	3060
1750	35.288	129	32.982	127	31.594	126	31.034	126	3150
1800	35.417	128	33.109	125	31.720	124	31.160	124	3240
1850	35.545	128	33.234	123	31.844	122	31.284	121	3330
1900	35.673	129	33.357	122	31.966	120	31.405	119	3420
1950	35.802	132	33.479	121	32.086	118	31.524	117	3510
2000	35.934	136	33.600	121	32.204	117	31.641	116	3600
2050	36.070	142	33.721	121	32.321	116	31.757	115	3690
2100	36.212	150	33.842	122	32.437	116	31.872	114	3780
2150	36.362	159	33.964	124	32.553	116	31.986	114	3870
2200	36.521	169	34.088	126	32.669	116	32.100	113	3960
2250	36.690	180	34.214	130	32.785	117	32.213	114	4050
2300	36.870		34.344	135	32.902	119	32.327	115	4140
2350			34.479	140	33.021	121	32.442	116	4230
2400			34.619	147	33.142	124	32.558	118	4320
2450			34.766	156	33.266	127	32.676	120	4410
2500			34.922	164	33.393	131	32.796	123	4500
2550			35.086	175	33.524	135	32.919	126	4590
2600			35.261	187	33.659	140	33.045	129	4680
2650			35.448	199	33.799	146	33.174	133	4770
2700			35.647	213	33.945	151	33.307	137	4860
2750			35.860	226	34.096	157	33.444	141	4950
2800			36.086		34.253		33.585		5040

Table 2-5. ENTROPY OF AIR - Cont.

S/R

°K	1 atm		4 atm		7 atm		10 atm		°R
100	20.049	340							180
110	20.389	309	18.903	334	18.255	355	17.786	386	198
120	20.698	283	19.237	300	18.610	314	18.172	333	216
130	20.981	262	19.537	273	18.924	282	18.505	296	234
140	21.243	243	19.810	252	19.206	259	18.801	268	252
150	21.486	227	20.062	233	19.465	239	19.069	245	270
160	21.713	213	20.295	216	19.704	222	19.314	227	288
170	21.926	201	20.511	204	19.926	208	19.541	212	306
180	22.127	190	20.715	193	20.134	195	19.753	199	324
190	22.317	180	20.908	183	20.329	184	19.952	187	342
200	22.497	171	21.091	173	20.513	175	20.139	177	360
210	22.668	163	21.264	165	20.688	166	20.316	168	378
220	22.831	155	21.429	157	20.854	158	20.484	160	396
230	22.986	149	21.586	151	21.012	151	20.644	153	414
240	23.135	143	21.737	144	21.163	145	20.797	147	432
250	23.278	138	21.881	138	21.308	140	20.944	140	450
260	23.416	132	22.019	139	21.448	135	21.084	135	468
270	23.548	127	22.152	129	21.583	130	21.219	129	486
280	23.675	123	22.281	124	21.713	125	21.348	125	504
290	23.798	119	22.405	119	21.838	120	21.473	121	522
300	23.917	115	22.524	115	21.958	116	21.594	116	540
310	24.032	112	22.639	112	22.074	112	21.710	113	558
320	24.144	108	22.751	109	22.186	109	21.823	109	576
330	24.252	105	22.860	105	22.295	105	21.932	106	594
340	24.357	102	22.965	102	22.400	102	22.038	103	612
350	24.459	99	23.067	99	22.502	100	22.141	100	630
360	24.558	96	23.166	97	22.602	97	22.241	97	648
370	24.654	94	23.263	94	22.699	95	22.338	95	666
380	24.748	92	23.357	92	22.794	92	22.433	93	684
390	24.840	89	23.449	90	22.886	90	22.526	90	702
400	24.929	87	23.539	88	22.976	87	22.616	87	720
410	25.016	85	23.627	85	23.063	86	22.703	86	738
420	25.101	84	23.712	83	23.149	84	22.789	84	756
430	25.185	82	23.795	82	23.233	82	22.873	82	774
440	25.267	80	23.877	80	23.315	80	22.955	81	792
450	25.347	77	23.957	78	23.395	78	23.036	78	810
460	25.424	77	24.035	77	23.473	77	23.114	77	828
470	25.501	75	24.112	76	23.550	76	23.191	76	846
480	25.576	74	24.188	74	23.626	74	23.267	74	864
490	25.650	73	24.262	73	23.700	73	23.341	73	882
500	25.723	71	24.335	71	23.773	71	23.414	71	900
510	25.794	70	24.406	69	23.844	70	23.485	70	918
520	25.864	69	24.475	69	23.914	68	23.555	69	936
530	25.933	67	24.544	68	23.982	68	23.624	68	954
540	26.000	67	24.612	67	24.050	67	23.692	67	972
550	26.067	65	24.679	65	24.117	66	23.759	66	990
560	26.132	64	24.744	64	24.183	64	23.825	64	1008
570	26.196	63	24.808	63	24.247	63	23.889	63	1026
580	26.259	62	24.871	62	24.310	62	23.952	63	1044
590	26.321	62	24.933	62	24.372	62	24.015	62	1062
600	26.383	61	24.995	61	24.434	61	24.077	61	1080
610	26.444	60	25.056	60	24.495	60	24.138	60	1098
620	26.504	59	25.116	59	24.555	59	24.198	59	1116
630	26.563	58	25.175	58	24.614	58	24.257	58	1134
640	26.621	57	25.233	57	24.672	58	24.315	57	1152
650	26.678		25.290		24.730		24.372		1170

°K	1 atm		4 atm		7 atm		10 atm		°R
650	26.678	57	25.290	57	24.730	57	24.372	57	1170
660	26.735	56	25.347	56	24.787	56	24.429	56	1188
670	26.791	55	25.403	55	24.843	55	24.485	55	1206
680	26.846	54	25.458	55	24.898	54	24.540	55	1224
690	26.900	54	25.513	54	24.952	54	24.595	54	1242
700	26.954	53	25.567	53	25.006	53	24.649	53	1260
710	27.007	53	25.620	53	25.059	53	24.702	53	1278
720	27.060	52	25.673	52	25.112	52	24.755	52	1296
730	27.112	51	25.725	51	25.164	51	24.807	51	1314
740	27.163	51	25.776	51	25.215	51	24.858	51	1332
750	27.214	50	25.827	50	25.266	50	24.909	50	1350
760	27.264	50	25.877	50	25.316	50	24.959	50	1368
770	27.314	49	25.927	49	25.366	49	25.009	49	1386
780	27.363	49	25.976	49	25.415	49	25.058	49	1404
790	27.412	48	26.025	48	25.464	48	25.107	48	1422
800	27.460	233	26.073	233	25.512	234	25.155	233	1440
850	27.693	222	26.306	222	25.746	222	25.388	222	1530
900	27.915	212	26.528	213	25.968	213	25.610	212	1620
950	28.127	203	26.741	203	26.181	203	25.822	203	1710
1000	28.330	195	26.944	195	26.384	195	26.025	196	1800
1050	28.525	188	27.139	188	26.579	188	26.221	187	1890
1100	28.713	181	27.327	181	26.767	180	26.408	180	1980
1150	28.894	174	27.508	174	26.947	175	26.588	175	2070
1200	29.068	168	27.682	168	27.122	168	26.763	168	2160
1250	29.236	163	27.850	163	27.290	163	26.931	162	2250
1300	29.399	158	28.013	158	27.453	158	27.093	158	2340
1350	29.557	154	28.171	153	27.611	153	27.251	153	2430
1400	29.711	149	28.324	149	27.764	149	27.404	149	2520
1450	29.860	145	28.473	145	27.913	145	27.553	145	2610
1500	30.005	141	28.618	141	28.058	141	27.698	141	2700
1550	30.146	138	28.759	138	28.199	138	27.839	138	2790
1600	30.284	134	28.897	134	28.337	134	27.977	134	2880
1650	30.418	131	29.031	131	28.471	131	28.111	131	2970
1700	30.549	129	29.162	128	28.602	128	28.242	128	3060
1750	30.678	126	29.290	126	28.730	126	28.370	126	3150
1800	30.804	123	29.416	123	28.856	123	28.496	123	3240
1850	30.927	121	29.539	121	28.979	121	28.619	121	3330
1900	31.048	119	29.660	119	29.100	119	28.740	118	3420
1950	31.167	117	29.779	117	29.219	116	28.858	116	3510
2000	31.284	116	29.896	115	29.335	115	28.974	114	3600
2050	31.400	114	30.011	113	29.450	113	29.088	113	3690
2100	31.514	113	30.124	112	29.563	111	29.201	111	3780
2150	31.627	113	30.236	110	29.674	110	29.312	109	3870
2200	31.740	112	30.346	109	29.784	108	29.421	108	3960
2250	31.852	112	30.455	108	29.892	107	29.529	107	4050
2300	31.964	113	30.563	108	29.999	107	29.636	106	4140
2350	32.077	114	30.671	107	30.106	106	29.742	105	4230
2400	32.191	115	30.778	107	30.212	105	29.847	104	4320
2450	32.306	117	30.885	107	30.317	105	29.951	104	4410
2500	32.423	119	30.992	108	30.422	105	30.055	104	4500
2550	32.542	121	31.100	108	30.527	105	30.159	104	4590
2600	32.663	125	31.208	109	30.632	106	30.263	104	4680
2650	32.788	129	31.317	111	30.738	106	30.367	104	4770
2700	32.917	133	31.428	112	30.844	107	30.471	105	4860
2750	33.050	138	31.540	114	30.951	108	30.576	105	4950
2800	33.188	143	31.654	116	31.059	109	30.681	106	5040
2850	33.331	150	31.770	119	31.168	111	30.787	108	5130
2900	33.481	156	31.889	122	31.279	113	30.895	109	5220
2950	33.637	162	32.011	125	31.392	115	31.004	110	5310
3000	33.799		32.136		31.507		31.114		5400

Table 2-5. ENTROPY OF AIR - Cont. S/R

°K	10 atm		40 atm		70 atm		100 atm		°R
150	19.069	245							270
160	19.314	227	17.475	355					288
170	19.541	212	17.830	253					306
180	19.753	199	18.083	246	17.164	328	16.441	420	324
190	19.952	187	18.329	222	17.492	275	16.861	323	342
200	20.139	177	18.551	204	17.767	242	17.184	287	360
210	20.316	168	18.755	191	18.009	218	17.471	247	378
220	20.484	160	18.946	177	18.227	199	17.718	220	396
230	20.644	153	19.123	167	18.426	184	17.938	200	414
240	20.797	147	19.290	159	18.610	172	18.138	186	432
250	20.944	140	19.449	151	18.782	163	18.324	172	450
260	21.084	135	19.600	143	18.945	153	18.496	162	468
270	21.219	129	19.743	137	19.098	144	18.658	154	486
280	21.348	125	19.880	133	19.242	140	18.812	148	504
290	21.473	121	20.013	125	19.382	131	18.960	135	522
300	21.594	116	20.138	123	19.513	128	19.095	133	540
310	21.710	113	20.261	118	19.641	123	19.228	128	558
320	21.823	109	20.379	113	19.764	118	19.356	122	576
330	21.932	106	20.492	110	19.882	112	19.478	115	594
340	22.038	103	20.602	105	19.994	108	19.593	111	612
350	22.141	100	20.707	103	20.102	107	19.704	109	630
360	22.241	97	20.810	101	20.209	103	19.813	105	648
370	22.338	95	20.911	97	20.312	100	19.918	103	666
380	22.433	93	21.008	95	20.412	96	20.021	98	684
390	22.526	90	21.103	91	20.508	94	20.119	95	702
400	22.616	87	21.194	90	20.602	92	20.214	94	720
410	22.703	86	21.284	88	20.694	89	20.308	91	738
420	22.789	84	21.372	86	20.783	87	20.399	88	756
430	22.873	82	21.458	83	20.870	85	20.487	87	774
440	22.955	81	21.541	82	20.955	83	20.574	84	792
450	23.036	78	21.623	80	21.038	81	20.658	84	810
460	23.114	77	21.703	78	21.119	80	20.742	81	828
470	23.191	76	21.781	76	21.199	78	20.823	79	846
480	23.267	74	21.857	75	21.277	76	20.902	78	864
490	23.341	73	21.932	74	21.353	75	20.980	76	882
500	23.414	71	22.006	73	21.428	73	21.056	74	900
510	23.485	70	22.079	71	21.501	72	21.130	72	918
520	23.555	69	22.150	70	21.573	70	21.202	70	936
530	23.624	68	22.220	69	21.643	69	21.272	69	954
540	23.692	67	22.289	67	21.712	68	21.341	68	972
550	23.759	66	22.356	66	21.780	67	21.409	67	990
560	23.825	64	22.422	65	21.847	66	21.476	66	1008
570	23.889	63	22.487	64	21.913	65	21.542	66	1026
580	23.952	63	22.551	63	21.978	64	21.608	65	1044
590	24.015	62	22.614	63	22.042	62	21.673	63	1062
600	24.077	61	22.677	61	22.104	62	21.736	62	1080
610	24.138	60	22.738	60	22.166	61	21.798	61	1098
620	24.198	59	22.798	60	22.227	60	21.859	60	1116
630	24.257	58	22.858	59	22.287	59	21.919	60	1134
640	24.315	57	22.917	58	22.346	58	21.979	59	1152
650	24.372	57	22.975	57	22.404	58	22.038	58	1170
660	24.429	56	23.032	56	22.462	57	22.096	57	1188
670	24.485	55	23.088	56	22.519	56	22.153	56	1206
680	24.540	55	23.144	55	22.575	55	22.209	56	1224
690	24.595	54	23.199	54	22.630	55	22.265	55	1242
700	24.649		23.253		22.685		22.320		1260

345970 O - 55 - 5

Table 2-5. ENTROPY OF AIR - Cont.

S/R

°K	10 atm		40 atm		70 atm		100 atm		°R
700	24.649	53	23.253	54	22.685	54	22.320	54	1260
710	24.702	53	23.307	53	22.739	53	22.374	53	1278
720	24.755	52	23.360	52	22.792	52	22.427	53	1296
730	24.807	51	23.412	52	22.844	52	22.480	52	1314
740	24.858	51	23.464	51	22.896	51	22.532	52	1332
750	24.909	50	23.515	51	22.947	51	22.584	51	1350
760	24.959	50	23.566	50	22.998	50	22.635	50	1368
770	25.009	49	23.616	49	23.048	50	22.685	50	1386
780	25.058	49	23.665	49	23.098	49	22.735	49	1404
790	25.107	48	23.714	48	23.147	49	22.784	49	1422
800	25.155	233	23.762	234	23.196	236	22.833	236	1440
850	25.388	222	23.996	223	23.432	223	23.069	224	1530
900	25.610	212	24.219	212	23.655	212	23.293	212	1620
950	25.822	203	24.431	203	23.867	204	23.505	204	1710
1000	26.025	196	24.634	196	24.071	196	23.709	196	1800
1050	26.221	187	24.830	188	24.267	187	23.905	188	1890
1100	26.408	180	25.018	180	24.454	181	24.093	181	1980
1150	26.588	175	25.198	175	24.635	174	24.274	174	2070
1200	26.763	168	25.373	167	24.809	167	24.448	167	2160
1250	26.931	162	25.540	162	24.976	162	24.615	162	2250
1300	27.093	158	25.702	158	25.138	158	24.777	158	2340
1350	27.251	153	25.860	153	25.296	152	24.935	152	2430
1400	27.404	149	26.013	149	25.448	149	25.087	149	2520
1450	27.553	145	26.162	144	25.597	144	25.236	144	2610
1500	27.698	141	26.306	141	25.741	141	25.380	141	2700
1550	27.839	138	26.447	138	25.882	138	25.521	138	2790
1600	27.977	134	26.585	134	26.020	135	25.659	135	2880
1650	28.111	131	26.719	131	26.155	132	25.794	132	2970
1700	28.242	128	26.850	128	26.287	129	25.926	129	3060
1750	28.370	126	26.978	126	26.416	126	26.055	126	3150
1800	28.496	123	27.104	123	26.542	123	26.181	123	3240
1850	28.619	121	27.227	121	26.665	120	26.304	120	3330
1900	28.740	118	27.348	118	26.785	118	26.424	118	3420
1950	28.858	116	27.466	116	26.903	116	26.542	116	3510
2000	28.974	114	27.582	114	27.019	114	26.658	114	3600
2050	29.088	113	27.696	112	27.133	112	26.772	112	3690
2100	29.201	111	27.808	110	27.245	110	26.884	110	3780
2150	29.312	109	27.918	109	27.355	108	26.994	108	3870
2200	29.421	108	28.027	107	27.463	107	27.102	107	3960
2250	29.529	107	28.134	106	27.570	106	27.209	105	4050
2300	29.636	106	28.240	104	27.676	104	27.314	104	4140
2350	29.742	105	28.344	103	27.780	103	27.418	102	4230
2400	29.847	104	28.447	102	27.883	101	27.520	101	4320
2450	29.951	104	28.549	101	27.984	100	27.621	100	4410
2500	30.055	104	28.650	100	28.084	99	27.721	99	4500
2550	30.159	104	28.750	99	28.183	98	27.820	98	4590
2600	30.263	104	28.849	99	28.281	98	27.918	97	4680
2650	30.367	104	28.948	98	28.379	97	28.015	96	4770
2700	30.471	105	29.046	98	28.476	97	28.111	96	4860
2750	30.576	105	29.144	98	28.573	96	28.207	95	4950
2800	30.681	106	29.242	98	28.669	96	28.302	95	5040
2850	30.787	108	29.340	98	28.765	96	28.397	94	5130
2900	30.895	109	29.438	98	28.861	96	28.491	94	5220
2950	31.004	110	29.536	98	28.957	95	28.585	93	5310
3000	31.114		29.634		29.052		28.678		5400

Table 2-6. SPECIFIC-HEAT RATIO OF AIR

$\gamma = C_p/C_v$

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
50	1.4048	- 17							90
60	1.4031	- 8							108
70	1.4023	- 4							126
80	1.4019	- 2							144
90	1.4017	- 1	1.4046	- 8	1.4139	- 31	1.4237	- 55	162
100	1.4016	- 1	1.4038	- 6	1.4108	- 21	1.4182	- 38	180
110	1.4015		1.4032	- 3	1.4087	- 14	1.4144	- 25	198
120	1.4015		1.4029	- 3	1.4073	- 10	1.4119	- 18	216
130	1.4015		1.4026	- 2	1.4063	- 8	1.4101	- 14	234
140	1.4015	- 1	1.4024	- 2	1.4055	- 6	1.4087	- 11	252
150	1.4014		1.4022	- 1	1.4049	- 5	1.4076	- 9	270
160	1.4014		1.4021	- 1	1.4044	- 4	1.4067	- 7	288
170	1.4014		1.4020	- 1	1.4040	- 4	1.4060	- 6	306
180	1.4014	- 1	1.4019	- 1	1.4036	- 3	1.4054	- 6	324
190	1.4013		1.4018	- 1	1.4033	- 3	1.4048	- 5	342
200	1.4013		1.4017	- 1	1.4030	- 2	1.4043	- 3	360
210	1.4013	- 1	1.4016	- 1	1.4028	- 2	1.4040	- 3	378
220	1.4012	- 1	1.4015	- 1	1.4026	- 2	1.4037	- 3	396
230	1.4011		1.4014	- 1	1.4024	- 2	1.4034	- 3	414
240	1.4011	- 2	1.4013	- 2	1.4022	- 2	1.4031	- 3	432
250	1.4009	- 1	1.4011	- 1	1.4020	- 3	1.4028	- 4	450
260	1.4008	- 2	1.4010	- 2	1.4017	- 3	1.4024	- 2	468
270	1.4006	- 2	1.4008	- 2	1.4014	- 2	1.4022	- 4	486
280	1.4004	- 2	1.4006	- 2	1.4012	- 3	1.4018	- 3	504
290	1.4002	- 2	1.4004	- 3	1.4009	- 3	1.4015	- 3	522
300	1.4000	- 3	1.4001	- 3	1.4006	- 3	1.4012	- 4	540
310	1.3997	- 4	1.3998	- 3	1.4003	- 3	1.4008	- 4	558
320	1.3993	- 3	1.3995	- 4	1.4000	- 5	1.4004	- 5	576
330	1.3990	- 4	1.3991	- 4	1.3995	- 5	1.3999	- 5	594
340	1.3986	- 5	1.3987	- 5	1.3990	- 5	1.3994	- 5	612
350	1.3981	- 5	1.3982	- 5	1.3985	- 5	1.3989	- 5	630
360	1.3976	- 6	1.3977	- 5	1.3980	- 5	1.3984	- 6	648
370	1.3970	- 6	1.3972	- 6	1.3975	- 6	1.3978	- 6	666
380	1.3964	- 6	1.3966	- 6	1.3969	- 7	1.3972	- 7	684
390	1.3958	- 6	1.3960	- 7	1.3962	- 6	1.3965	- 7	702
400	1.3952	- 7	1.3953	- 7	1.3956	- 8	1.3958	- 7	720
410	1.3945	- 8	1.3946	- 8	1.3948	- 7	1.3951	- 8	738
420	1.3937	- 7	1.3938	- 7	1.3941	- 8	1.3943	- 8	756
430	1.3930	- 8	1.3931	- 8	1.3933	- 8	1.3935	- 8	774
440	1.3922	- 9	1.3923	- 9	1.3925	- 9	1.3927	- 9	792
450	1.3913	- 9	1.3914	- 9	1.3916	- 9	1.3918	- 9	810
460	1.3904	- 9	1.3905	- 9	1.3907	- 9	1.3909	- 9	828
470	1.3895	- 9	1.3896	- 9	1.3898	- 11	1.3900	- 10	846
480	1.3886	- 10	1.3887	- 10	1.3887	- 9	1.3890	- 10	864
490	1.3876	- 10	1.3877	- 10	1.3878	- 10	1.3880	- 10	882
500	1.3866	- 10	1.3867	- 10	1.3868	- 10	1.3870	- 11	900
510	1.3856	- 10	1.3857	- 11	1.3858	- 11	1.3859	- 10	918
520	1.3846	- 11	1.3846	- 10	1.3847	- 10	1.3849	- 11	936
530	1.3835	- 11	1.3836	- 11	1.3837	- 11	1.3838	- 10	954
540	1.3824	- 11	1.3825	- 11	1.3826	- 11	1.3828	- 11	972
550	1.3813	- 11	1.3814	- 11	1.3815	- 11	1.3817	- 12	990
560	1.3802	- 11	1.3803	- 11	1.3804	- 11	1.3805	- 11	1008
570	1.3791	- 11	1.3792	- 12	1.3793	- 12	1.3794	- 12	1026
580	1.3780	- 11	1.3780	- 11	1.3781	- 11	1.3782	- 11	1044
590	1.3769	- 12	1.3769	- 11	1.3770	- 12	1.3771	- 12	1062
600	1.3757	- 11	1.3758	- 12	1.3758	- 11	1.3759	- 11	1080
610	1.3746	- 12	1.3746	- 11	1.3747	- 12	1.3748	- 11	1098
620	1.3734	- 11	1.3735	- 12	1.3735	- 11	1.3737	- 12	1116
630	1.3723	- 11	1.3723	- 11	1.3724	- 11	1.3725	- 11	1134
640	1.3712	- 12	1.3712	- 12	1.3713	- 12	1.3714	- 12	1152
650	1.3700		1.3700		1.3701		1.3702		1170

Table 2-6. SPECIFIC-HEAT RATIO OF AIR - Cont. $\gamma = C_p/C_v$

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
650	1.3700	- 11	1.3700	- 11	1.3701	- 11	1.3702	- 12	1170
660	1.3689	- 12	1.3689	- 12	1.3690	- 12	1.3690	- 11	1188
670	1.3677	- 11	1.3677	- 11	1.3678	- 12	1.3679	- 11	1206
680	1.3666	- 11	1.3666	- 11	1.3666	- 11	1.3668	- 12	1224
690	1.3655	- 12	1.3655	- 11	1.3655	- 11	1.3656	- 11	1242
700	1.3643	- 11	1.3644	- 11	1.3644	- 11	1.3645	- 11	1260
710	1.3632	- 11	1.3633	- 11	1.3633	- 11	1.3634	- 11	1278
720	1.3621	- 11	1.3622	- 11	1.3622	- 11	1.3623	- 11	1296
730	1.3610	- 11	1.3611	- 11	1.3611	- 11	1.3612	- 11	1314
740	1.3599	- 10	1.3600	- 11	1.3600	- 11	1.3601	- 11	1332
750	1.3589	- 11	1.3589	- 10	1.3589	- 10	1.3590	- 10	1350
760	1.3578	- 10	1.3579	- 11	1.3579	- 11	1.3580	- 11	1368
770	1.3568	- 11	1.3568	- 10	1.3568	- 11	1.3569	- 11	1386
780	1.3557	- 10	1.3558	- 11	1.3557	- 9	1.3558	- 10	1404
790	1.3547	- 1	1.3547	- 1	1.3548	- 1	1.3548	- 1	1422
800	1.354	- 5	1.354	- 5	1.354	- 5	1.354	- 5	1440
850	1.349	- 5	1.349	- 5	1.349	- 5	1.349	- 5	1530
900	1.344	- 4	1.344	- 4	1.344	- 4	1.344	- 4	1620
950	1.340	- 4	1.340	- 4	1.340	- 4	1.340	- 4	1710
1000	1.336	- 7	1.336	- 7	1.336	- 7	1.336	- 7	1800
1100	1.329	- 7	1.329	- 7	1.329	- 7	1.329	- 7	1980
1200	1.322	- 6	1.322	- 6	1.322	- 6	1.322	- 6	2160
1300	1.316	- 6	1.316	- 6	1.316	- 6	1.316	- 6	2340
1400	1.310	- 6	1.310	- 6	1.310	- 6	1.310	- 6	2520
1500	1.304	- 6	1.304	- 5	1.304	- 5	1.304	- 5	2700
1600	1.298	- 8	1.299	- 7	1.299	- 6	1.299	- 6	2880
1700	1.290	-10	1.292	- 6	1.293	- 6	1.293	- 5	3060
1800	1.280	-14	1.286	- 9	1.287	- 6	1.288	- 7	3240
1900	1.266	-23	1.277	-11	1.281	- 9	1.281	- 8	3420
2000	1.243	-20	1.266	-12	1.272	- 9	1.273	- 8	3600
2100	1.223		1.254	-15	1.263	-10	1.265	- 9	3780
2200			1.239	-17	1.253	-10	1.256	- 8	3960
2300			1.222	-16	1.243	-14	1.248	-13	4140
2400			1.206	-16	1.229	-15	1.235	-12	4320
2500			1.190	-12	1.214	-13	1.223	-12	4500
2600			1.178	- 7	1.201	-10	1.211	-11	4680
2700			1.171	- 3	1.191	- 7	1.200	- 9	4860
2800			1.168	1	1.184	- 5	1.191	- 6	5040
2900			1.169	4	1.179	- 1	1.185	- 4	5220
3000			1.173		1.178		1.181		5400

Table 2-6. SPECIFIC-HEAT RATIO OF AIR - Cont. $\gamma = C_p/C_v$

°K	1 atm		4 atm		7 atm		10 atm		°R
110	1.4202	- 36	1.4960	-230	1.6035	-522	1.7672	-1277	198
120	1.4166	- 27	1.4730	-152	1.5513	-374	1.6395	- 655	216
130	1.4139	- 20	1.4578	-105	1.5139	-238	1.5740	- 390	234
140	1.4119	- 17	1.4473	- 80	1.4901	-167	1.5350	- 266	252
150	1.4102	- 13	1.4393	- 55	1.4734	-120	1.5084	- 188	270
160	1.4089	- 10	1.4338	- 48	1.4614	- 93	1.4896	- 140	288
170	1.4079	- 8	1.4290	- 37	1.4521	- 73	1.4756	- 108	306
180	1.4071	- 7	1.4253	- 31	1.4448	- 57	1.4648	- 88	324
190	1.4064	- 7	1.4222	- 25	1.4391	- 47	1.4560	- 71	342
200	1.4057	- 4	1.4197	- 20	1.4344	- 38	1.4489	- 52	360
210	1.4053	- 5	1.4177	- 19	1.4306	- 34	1.4437	- 48	378
220	1.4048	- 4	1.4158	- 15	1.4272	- 26	1.4389	- 41	396
230	1.4044	- 4	1.4143	- 14	1.4246	- 24	1.4348	- 35	414
240	1.4040	- 4	1.4129	- 11	1.4222	- 21	1.4313	- 29	432
250	1.4036	- 4	1.4118	- 11	1.4201	- 18	1.4284	- 25	450
260	1.4032	- 3	1.4107	- 10	1.4183	- 17	1.4259	- 23	468
270	1.4029	- 5	1.4097	- 10	1.4166	- 16	1.4236	- 22	486
280	1.4024	- 4	1.4087	- 9	1.4150	- 15	1.4214	- 20	504
290	1.4020	- 3	1.4078	- 8	1.4135	- 12	1.4194	- 17	522
300	1.4017	- 4	1.4070	- 8	1.4123	- 12	1.4177	- 16	540
310	1.4013	- 5	1.4062	- 9	1.4111	- 11	1.4161	- 15	558
320	1.4008	- 4	1.4053	- 8	1.4100	- 11	1.4146	- 15	576
330	1.4004	- 5	1.4045	- 7	1.4089	- 12	1.4131	- 13	594
340	1.3999	- 6	1.4038	- 8	1.4077	- 10	1.4118	- 14	612
350	1.3993	- 6	1.4030	- 8	1.4067	- 11	1.4104	- 13	630
360	1.3987	- 6	1.4022	- 8	1.4056	- 10	1.4091	- 12	648
370	1.3981	- 6	1.4014	- 9	1.4046	- 10	1.4079	- 13	666
380	1.3975	- 7	1.4005	- 8	1.4036	- 11	1.4066	- 12	684
390	1.3968	- 7	1.3997	- 10	1.4025	- 11	1.4054	- 13	702
400	1.3961	- 8	1.3987	- 8	1.4014	- 10	1.4041	- 13	720
410	1.3953	- 7	1.3979	- 9	1.4004	- 10	1.4028	- 12	738
420	1.3946	- 8	1.3970	- 10	1.3994	- 12	1.4016	- 13	756
430	1.3938	- 9	1.3960	- 10	1.3982	- 10	1.4003	- 12	774
440	1.3929	- 9	1.3950	- 10	1.3972	- 12	1.3991	- 12	792
450	1.3920	- 9	1.3940	- 10	1.3960	- 11	1.3979	- 12	810
460	1.3911	- 10	1.3930	- 11	1.3949	- 11	1.3967	- 12	828
470	1.3901	- 9	1.3919	- 10	1.3938	- 12	1.3955	- 12	846
480	1.3892	- 11	1.3909	- 11	1.3926	- 12	1.3943	- 13	864
490	1.3881	- 10	1.3898	- 11	1.3914	- 11	1.3930	- 12	882
500	1.3871	- 10	1.3887	- 11	1.3903	- 12	1.3918	- 12	900
510	1.3861	- 10	1.3876	- 11	1.3891	- 12	1.3906	- 13	918
520	1.3851	- 11	1.3865	- 12	1.3879	- 13	1.3893	- 13	936
530	1.3840	- 11	1.3853	- 11	1.3866	- 12	1.3880	- 13	954
540	1.3829	- 11	1.3842	- 12	1.3854	- 12	1.3867	- 13	972
550	1.3818	- 12	1.3830	- 12	1.3842	- 13	1.3854	- 14	990
560	1.3806	- 11	1.3818	- 12	1.3829	- 12	1.3840	- 13	1008
570	1.3795	- 12	1.3806	- 12	1.3817	- 12	1.3827	- 13	1026
580	1.3783	- 11	1.3794	- 12	1.3805	- 13	1.3814	- 13	1044
590	1.3772	- 12	1.3782	- 12	1.3792	- 12	1.3801	- 13	1062
600	1.3760	- 11	1.3770	- 12	1.3780	- 12	1.3788	- 13	1080
610	1.3749	- 12	1.3758	- 12	1.3768	- 12	1.3775	- 12	1098
620	1.3737	- 11	1.3746	- 12	1.3756	- 13	1.3763	- 12	1116
630	1.3726	- 12	1.3734	- 12	1.3743	- 13	1.3751	- 12	1134
640	1.3714	- 12	1.3722	- 12	1.3730	- 11	1.3739	- 13	1152
650	1.3702	- 11	1.3710	- 11	1.3719	- 13	1.3726	- 12	1170
660	1.3691	- 12	1.3699	- 12	1.3706	- 12	1.3714	- 13	1188
670	1.3679	- 11	1.3687	- 12	1.3694	- 12	1.3701	- 13	1206
680	1.3668	- 11	1.3675	- 11	1.3682	- 12	1.3688	- 12	1224
690	1.3657	- 11	1.3664	- 12	1.3670	- 12	1.3676	- 12	1242
700	1.3646		1.3652		1.3658		1.3664		1260

Table 2-6. SPECIFIC-HEAT RATIO OF AIR - Cont.

$\gamma = C_p/C_v$

°K	1 atm		4 atm		7 atm		10 atm		°R
700	1.3646	- 12	1.3652	- 11	1.3658	- 11	1.3664	- 12	1260
710	1.3634	- 11	1.3641	- 12	1.3647	- 12	1.3652	- 11	1278
720	1.3623	- 11	1.3629	- 11	1.3635	- 11	1.3641	- 12	1296
730	1.3612	- 11	1.3618	- 11	1.3624	- 11	1.3629	- 11	1314
740	1.3601	- 10	1.3607	- 11	1.3613	- 12	1.3618	- 12	1332
750	1.3591	- 11	1.3596	- 11	1.3601	- 11	1.3606	- 11	1350
760	1.3580	- 11	1.3585	- 11	1.3590	- 11	1.3595	- 12	1368
770	1.3569	- 10	1.3574	- 10	1.3579	- 11	1.3583	- 11	1386
780	1.3559	- 10	1.3564	- 11	1.3568	- 11	1.3572	- 11	1404
790	1.3549	- 9	1.3553	- 11	1.3557	- 1	1.3561	- 1	1422
800	1.354	- 5	1.354	- 5	1.355	- 5	1.355	- 5	1440
850	1.349	- 4	1.349	- 4	1.350	- 5	1.350	- 5	1530
900	1.345	- 5	1.345	- 5	1.345	- 5	1.345	- 4	1620
950	1.340	- 4	1.340	- 4	1.340	- 4	1.341	- 5	1710
1000	1.336	- 7	1.336	- 7	1.336	- 7	1.336	- 7	1800
1100	1.329	- 7	1.329	- 7	1.329	- 7	1.329	- 7	1980
1200	1.322	- 6	1.322	- 6	1.322	- 6	1.322	- 6	2160
1300	1.316	- 6	1.316	- 6	1.316	- 6	1.316	- 6	2340
1400	1.310	- 6	1.310	- 6	1.310	- 6	1.310	- 6	2520
1500	1.304	- 5	1.304	- 5	1.304	- 5	1.304	- 5	2700
1600	1.299	- 6	1.299	- 6	1.299	- 6	1.299	- 6	2880
1700	1.293	- 5	1.293	- 5	1.293	- 5	1.293	- 5	3060
1800	1.288	- 6	1.288	- 5	1.288	- 5	1.288	- 5	3240
1900	1.282	- 8	1.283	- 6	1.283	- 5	1.283	- 5	3420
2000	1.274	- 7	1.277	- 6	1.278	- 6	1.278	- 6	3600
2100	1.267	- 8	1.271	- 6	1.272	- 5	1.272	- 5	3780
2200	1.259	-10	1.265	- 8	1.267	- 8	1.267	- 7	3960
2300	1.249	-11	1.257	- 8	1.259	- 6	1.260	- 6	4140
2400	1.238	-11	1.249	- 8	1.253	- 8	1.254	- 7	4320
2500	1.227	-12	1.241	- 9	1.245	- 8	1.247	- 7	4500
2600	1.215	-10	1.232	- 8	1.237	- 7	1.240	- 7	4680
2700	1.205	- 9	1.224	- 9	1.230	- 8	1.233	- 7	4860
2800	1.196	- 7	1.215	- 8	1.222	- 8	1.226	- 8	5040
2900	1.189	- 4	1.207	- 6	1.214	- 6	1.218	- 6	5220
3000	1.185		1.201		1.208		1.212		5400

Table 2-6. SPECIFIC-HEAT RATIO OF AIR - Cont. $\gamma = C_p/C_v$

°K	10 atm		40 atm		70 atm		100 atm		°R
150	1.5084	- 188	2.7372	-6204					270
160	1.4896	- 140	2.1168	-2282					288
170	1.4756	- 108	1.8886	-1208					306
180	1.4648	- 88	1.7678	- 756	2.3139	-2672			324
190	1.4560	- 71	1.6922	- 504	2.0467	-1467			342
200	1.4489	- 52	1.6418	- 392	1.9000	-1005	2.1376	-1574	360
210	1.4437	- 48	1.6026	- 286	1.7995	- 677	1.9802	-1033	378
220	1.4389	- 41	1.5740	- 225	1.7318	- 500	1.8769	- 757	396
230	1.4348	- 35	1.5515	- 181	1.6818	- 384	1.8012	- 573	414
240	1.4313	- 29	1.5334	- 149	1.6434	- 304	1.7439	- 449	432
250	1.4284	- 25	1.5185	- 123	1.6130	- 245	1.6990	- 359	450
260	1.4259	- 23	1.5062	- 106	1.5885	- 202	1.6631	- 292	468
270	1.4236	- 22	1.4956	- 91	1.5683	- 172	1.6339	- 245	486
280	1.4214	- 20	1.4865	- 79	1.5511	- 146	1.6094	- 207	504
290	1.4194	- 17	1.4786	- 69	1.5365	- 125	1.5887	- 176	522
300	1.4177	- 16	1.4717	- 59	1.5240	- 108	1.5711	- 152	540
310	1.4161	- 15	1.4658	- 55	1.5132	- 97	1.5559	- 134	558
320	1.4146	- 15	1.4603	- 50	1.5035	- 87	1.5425	- 118	576
330	1.4131	- 13	1.4553	- 46	1.4948	- 77	1.5307	- 105	594
340	1.4118	- 14	1.4507	- 42	1.4871	- 67	1.5202	- 93	612
350	1.4104	- 13	1.4465	- 36	1.4804	- 62	1.5109	- 85	630
360	1.4091	- 12	1.4429	- 35	1.4742	- 57	1.5024	- 77	648
370	1.4079	- 13	1.4394	- 33	1.4685	- 53	1.4947	- 69	666
380	1.4066	- 12	1.4361	- 32	1.4632	- 49	1.4878	- 65	684
390	1.4054	- 13	1.4329	- 30	1.4583	- 46	1.4813	- 61	702
400	1.4041	- 13	1.4299	- 26	1.4537	- 45	1.4752	- 59	720
410	1.4028	- 12	1.4273	- 27	1.4492	- 43	1.4693	- 55	738
420	1.4016	- 13	1.4246	- 26	1.4449	- 37	1.4638	- 50	756
430	1.4003	- 12	1.4220	- 26	1.4412	- 36	1.4588	- 47	774
440	1.3991	- 12	1.4194	- 26	1.4376	- 34	1.4541	- 43	792
450	1.3979	- 12	1.4168	- 20	1.4342	- 30	1.4498	- 37	810
460	1.3967	- 12	1.4148	- 21	1.4312	- 29	1.4461	- 36	828
470	1.3955	- 12	1.4127	- 21	1.4283	- 31	1.4425	- 36	846
480	1.3943	- 13	1.4106	- 20	1.4252	- 28	1.4389	- 34	864
490	1.3930	- 12	1.4086	- 21	1.4224	- 25	1.4355	- 34	882
500	1.3918	- 12	1.4065	- 19	1.4199	- 27	1.4321	- 32	900
510	1.3906	- 13	1.4046	- 19	1.4172	- 24	1.4289	- 31	918
520	1.3893	- 13	1.4027	- 19	1.4148	- 26	1.4258	- 31	936
530	1.3880	- 13	1.4008	- 20	1.4122	- 24	1.4227	- 29	954
540	1.3867	- 13	1.3988	- 19	1.4098	- 25	1.4198	- 28	972
550	1.3854	- 14	1.3969	- 17	1.4073	- 22	1.4170	- 28	990
560	1.3840	- 13	1.3952	- 18	1.4051	- 22	1.4142	- 26	1008
570	1.3827	- 13	1.3934	- 17	1.4029	- 21	1.4116	- 26	1026
580	1.3814	- 13	1.3917	- 18	1.4008	- 21	1.4090	- 25	1044
590	1.3801	- 13	1.3899	- 17	1.3987	- 20	1.4065	- 24	1062
600	1.3788	- 13	1.3882	- 16	1.3967	- 20	1.4041	- 23	1080
610	1.3775	- 12	1.3866	- 16	1.3947	- 20	1.4018	- 23	1098
620	1.3763	- 12	1.3850	- 16	1.3927	- 20	1.3995	- 22	1116
630	1.3751	- 12	1.3834	- 17	1.3907	- 19	1.3973	- 22	1134
640	1.3739	- 13	1.3817	- 16	1.3888	- 19	1.3951	- 20	1152
650	1.3726	- 12	1.3801	- 16	1.3869	- 19	1.3931	- 21	1170
660	1.3714	- 13	1.3785	- 15	1.3850	- 17	1.3910	- 20	1188
670	1.3701	- 13	1.3770	- 15	1.3833	- 17	1.3890	- 20	1206
680	1.3688	- 12	1.3755	- 15	1.3816	- 16	1.3870	- 19	1224
690	1.3676	- 12	1.3740	- 15	1.3800	- 17	1.3851	- 19	1242
700	1.3664		1.3725		1.3783		1.3832		1260

Table 2-6. SPECIFIC-HEAT RATIO OF AIR - Cont.

$\gamma = C_p/C_v$

°K	10 atm		40 atm		70 atm		100 atm		°R
700	1.3664	- 12	1.3725	- 13	1.3783	- 17	1.3832	- 18	1260
710	1.3652	- 11	1.3712	- 14	1.3766	- 16	1.3814	- 18	1278
720	1.3641	- 12	1.3698	- 13	1.3750	- 16	1.3796	- 18	1296
730	1.3629	- 11	1.3685	- 14	1.3734	- 16	1.3778	- 17	1314
740	1.3618	- 12	1.3671	- 13	1.3718	- 15	1.3761	- 16	1332
750	1.3606	- 11	1.3658	- 13	1.3703	- 15	1.3745	- 16	1350
760	1.3595	- 12	1.3645	- 13	1.3688	- 15	1.3729	- 16	1368
770	1.3583	- 11	1.3632	- 13	1.3673	- 14	1.3713	- 16	1386
780	1.3572	- 11	1.3619	- 13	1.3659	- 14	1.3697	- 16	1404
790	1.3561	- 10	1.3606	- 14	1.3645	- 15	1.3681	- 16	1422
800	1.3551	- 52	1.3592	- 61	1.3630	- 64	1.3665	- 70	1440
850	1.3499	- 47	1.3531	- 51	1.3566	- 60	1.3595	- 62	1530
900	1.3452	- 46	1.3480	- 50	1.3506	- 52	1.3533	- 57	1620
950	1.3406	- 42	1.3430	- 44	1.3454	- 48	1.3476	- 53	1710
1000	1.3364	- 76	1.3386	- 83	1.3406	- 87	1.3423	- 90	1800
1100	1.3288	- 67	1.3303	- 71	1.3319	- 76	1.3333	- 79	1980
1200	1.3221	- 65	1.3232	- 67	1.3243	- 69	1.3254	- 73	2160
1300	1.3156	- 58	1.3165	- 59	1.3174	- 63	1.3181	- 64	2340
1400	1.3098	- 55	1.3106	- 59	1.3111	- 59	1.3117	- 61	2520
1500	1.3043	- 5	1.3047	- 4	1.3052	- 3	1.3056	- 3	2700
1600	1.299	- 6	1.301	- 7	1.302	- 6	1.303	- 6	2880
1700	1.293	- 5	1.294	- 5	1.296	- 6	1.297	- 6	3060
1800	1.288	- 5	1.289	- 5	1.290	- 5	1.291	- 5	3240
1900	1.283	- 5	1.284	- 5	1.285	- 5	1.286	- 5	3420
2000	1.278	- 6	1.279	- 5	1.280	- 5	1.281	- 5	3600
2100	1.272	- 5	1.274	- 5	1.275	- 5	1.276	- 6	3780
2200	1.267	- 7	1.269	- 5	1.270	- 5	1.270	- 4	3960
2300	1.260	- 6	1.264	- 5	1.265	- 5	1.266	- 5	4140
2400	1.254	- 7	1.259	- 6	1.260	- 4	1.261	- 4	4320
2500	1.247	- 7	1.253	- 5	1.256	- 5	1.257	- 5	4500
2600	1.240	- 7	1.248	- 5	1.251	- 5	1.252	- 5	4680
2700	1.233	- 7	1.243	- 6	1.246	- 5	1.247	- 4	4860
2800	1.226	- 8	1.237	- 5	1.241	- 5	1.243	- 5	5040
2900	1.218	- 6	1.232	- 6	1.236	- 5	1.238	- 4	5220
3000	1.212		1.226		1.231		1.234		5400

Table 2-7. SOUND VELOCITY AT LOW FREQUENCY IN AIR a/a_0

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
50	.4275	410							90
60	.4685	376							108
70	.5061	351							126
80	.5412	328	.5402	329					144
90	.5740	311	.5731	314	.5707	319	.5682	324	162
100	.6051	295	.6045	296	.6026	301	.6006	306	180
110	.6346	283	.6341	284	.6327	286	.6312	289	198
120	.6629	271	.6625	271	.6613	274	.6601	276	216
130	.6900	260	.6896	261	.6887	263	.6877	265	234
140	.7160	251	.7157	252	.7150	253	.7142	255	252
150	.7411	243	.7409	244	.7403	245	.7397	246	270
160	.7654	236	.7653	235	.7648	236	.7643	237	288
170	.7890	229	.7888	230	.7884	231	.7880	231	306
180	.8119	222	.8118	222	.8115	222	.8111	223	324
190	.8341	216	.8340	217	.8337	217	.8334	218	342
200	.8557	212	.8557	211	.8554	213	.8552	214	360
210	.8769	206	.8768	207	.8767	207	.8766	207	378
220	.8975	201	.8975	201	.8974	202	.8973	202	396
230	.9176	197	.9176	197	.9176	196	.9175	197	414
240	.9373	193	.9373	193	.9372	194	.9372	195	432
250	.9566	189	.9566	189	.9566	190	.9567	189	450
260	.9755	186	.9755	186	.9756	185	.9756	186	468
270	.9941	181	.9941	181	.9941	182	.9942	181	486
280	1.0122	178	1.0122	178	1.0123	178	1.0123	179	504
290	1.0300	176	1.0300	176	1.0301	176	1.0302	176	522
300	1.0476	172	1.0476	172	1.0477	172	1.0478	172	540
310	1.0648	170	1.0648	170	1.0649	170	1.0650	170	558
320	1.0818	166	1.0818	166	1.0819	166	1.0820	166	576
330	1.0984	164	1.0984	164	1.0985	164	1.0986	164	594
340	1.1148	160	1.1148	160	1.1149	160	1.1150	160	612
350	1.1308	158	1.1308	159	1.1309	160	1.1310	160	630
360	1.1466	156	1.1467	156	1.1469	156	1.1470	156	648
370	1.1622	153	1.1623	153	1.1625	153	1.1626	153	666
380	1.1775	152	1.1776	152	1.1778	152	1.1779	152	684
390	1.1927	149	1.1928	149	1.1930	149	1.1931	149	702
400	1.2076	147	1.2077	147	1.2079	147	1.2080	147	720
410	1.2223	144	1.2224	144	1.2226	144	1.2227	144	738
420	1.2367	144	1.2368	144	1.2370	144	1.2371	144	756
430	1.2511	141	1.2512	141	1.2514	141	1.2515	141	774
440	1.2652	139	1.2653	139	1.2655	139	1.2656	140	792
450	1.2791	137	1.2792	137	1.2794	137	1.2796	137	810
460	1.2928	135	1.2929	135	1.2931	135	1.2933	135	828
470	1.3063	134	1.3064	134	1.3066	134	1.3068	134	846
480	1.3197	132	1.3198	132	1.3200	132	1.3202	132	864
490	1.3329	131	1.3330	131	1.3332	131	1.3334	131	882
500	1.3460	129	1.3461	129	1.3463	129	1.3465	129	900
510	1.3589	127	1.3590	127	1.3592	127	1.3594	127	918
520	1.3716	126	1.3717	126	1.3719	126	1.3721	126	936
530	1.3842	125	1.3843	125	1.3845	125	1.3847	125	954
540	1.3967	123	1.3968	123	1.3970	123	1.3972	123	972
550	1.4090	122	1.4091	122	1.4093	122	1.4095	122	990
560	1.4212	120	1.4213	120	1.4215	120	1.4217	120	1008
570	1.4332	119	1.4333	119	1.4335	119	1.4337	119	1026
580	1.4451	119	1.4452	119	1.4454	119	1.4456	119	1044
590	1.4570	12	1.4571	12	1.4573	12	1.4575	11	1062
600	1.469	11	1.469	11	1.469	12	1.469	12	1080
610	1.480	12	1.480	12	1.481	11	1.481	11	1098
620	1.492	11	1.492	11	1.492	11	1.492	12	1116
630	1.503	11	1.503	11	1.503	12	1.504	11	1134
640	1.514	11	1.514	12	1.515	11	1.515	11	1152
650	1.525		1.526		1.526		1.526		1170

Table 2-7. SOUND VELOCITY AT LOW FREQUENCY IN AIR - Cont.

a/a_0

°K	.01 atm		.1 atm		.4 atm		.7 atm		°R
650	1.525	11	1.526	11	1.526	11	1.526	11	1170
660	1.536	11	1.537	10	1.537	11	1.537	11	1188
670	1.547	11	1.547	11	1.548	11	1.548	11	1206
680	1.558	11	1.558	11	1.559	10	1.559	11	1224
690	1.569	11	1.569	11	1.569	11	1.570	10	1242
700	1.580	10	1.580	10	1.580	11	1.580	11	1260
710	1.590	11	1.590	11	1.591	10	1.591	10	1278
720	1.601	10	1.601	10	1.601	10	1.601	11	1296
730	1.611	11	1.611	11	1.611	11	1.612	10	1314
740	1.622	10	1.622	10	1.622	10	1.622	10	1332
750	1.632	10	1.632	10	1.632	10	1.632	11	1350
760	1.642	10	1.642	10	1.642	10	1.643	10	1368
770	1.652	10	1.652	10	1.652	11	1.653	10	1386
780	1.662	10	1.662	10	1.663	10	1.663	10	1404
790	1.672	10	1.672	10	1.673	10	1.673	10	1422
800	1.682	49	1.682	49	1.683	48	1.683	48	1440
850	1.731	47	1.731	47	1.731	47	1.731	48	1530
900	1.778	46	1.778	46	1.778	46	1.779	45	1620
950	1.824	44	1.824	44	1.824	45	1.824	45	1710
1000	1.868	44	1.868	44	1.869	43	1.869	43	1800
1050	1.912	42	1.912	42	1.912	42	1.912	42	1890
1100	1.954	41	1.954	41	1.954	42	1.954	42	1980
1150	1.995	41	1.995	41	1.996	40	1.996	40	2070
1200	2.036	40	2.036	40	2.036	40	2.036	40	2160
1250	2.076	38	2.076	38	2.076	39	2.076	39	2250
1300	2.114	38	2.114	38	2.115	37	2.115	37	2340
1350	2.152	37	2.152	37	2.152	37	2.152	37	2430
1400	2.189	36	2.189	36	2.189	36	2.189	37	2520
1450	2.225	36	2.225	36	2.225	36	2.226	35	2610
1500	2.261	34	2.261	35	2.261	35	2.261	35	2700
1550	2.295	34	2.296	34	2.296	34	2.296	35	2790
1600	2.329	33	2.330	33	2.330	34	2.331	33	2880
1650	2.362	32	2.363	33	2.364	33	2.364	33	2970
1700	2.394	30	2.396	32	2.397	32	2.397	33	3060
1750	2.424	30	2.428	31	2.429	32	2.430	31	3150
1800	2.454	28	2.459	31	2.461	30	2.461	31	3240
1850	2.482	26	2.490	28	2.491	30	2.492	30	3330
1900	2.508	24	2.518	28	2.521	29	2.522	29	3420
1950	2.532	21	2.546	28	2.550	29	2.551	29	3510
2000	2.553	21	2.574	26	2.579	26	2.580	27	3600
2050	2.574	19	2.600	24	2.605	27	2.607	27	3690
2100	2.593		2.624	24	2.632	25	2.634	28	3780
2150			2.648	22	2.657	26	2.662	26	3870
2200			2.670	22	2.683	24	2.688	25	3960
2250			2.692	22	2.707	23	2.713	24	4050
2300			2.714	21	2.730	23	2.737	23	4140
2350			2.735	21	2.753	23	2.760	24	4230
2400			2.756	21	2.776	21	2.784	22	4320
2450			2.777	20	2.797	21	2.806	21	4410
2500			2.797	22	2.818	22	2.827	22	4500
2550			2.819	23	2.840	22	2.849	22	4590
2600			2.842	25	2.862	24	2.871	22	4680
2650			2.867	27	2.886	23	2.893	22	4770
2700			2.894	29	2.909	24	2.915	24	4860
2750			2.923	30	2.933	25	2.939	23	4950
2800			2.953	33	2.958	27	2.962	25	5040
2850			2.986	35	2.985	28	2.987	26	5130
2900			3.021	36	3.013	29	3.013	26	5220
2950			3.057	38	3.042	29	3.039	27	5310
3000			3.095		3.071		3.066		5400

Table 2-7. SOUND VELOCITY AT LOW FREQUENCY IN AIR – Cont.

a/a_0

°K	1 atm		4 atm		7 atm		10 atm		°R
100	.5987	309							180
110	.6296	293	.6136	328	.5960	373	.5762	429	198
120	.6589	279	.6464	306	.6333	335	.6191	372	216
130	.6868	266	.6770	286	.6668	309	.6563	334	234
140	.7134	257	.7056	273	.6977	290	.6897	308	252
150	.7391	247	.7329	260	.7267	273	.7205	287	270
160	.7638	237	.7589	249	.7540	260	.7492	271	288
170	.7875	233	.7838	241	.7800	250	.7763	257	306
180	.8108	224	.8079	229	.8050	236	.8020	245	324
190	.8332	218	.8308	224	.8286	229	.8265	235	342
200	.8550	214	.8532	219	.8515	225	.8500	229	360
210	.8764	208	.8751	213	.8740	217	.8729	221	378
220	.8972	203	.8964	207	.8957	210	.8950	214	396
230	.9175	196	.9171	198	.9167	202	.9164	208	414
240	.9371	196	.9369	198	.9369	201	.9372	202	432
250	.9567	190	.9567	193	.9570	194	.9574	197	450
260	.9757	186	.9760	189	.9764	190	.9771	192	468
270	.9943	181	.9949	184	.9954	186	.9963	188	486
280	1.0124	179	1.0133	180	1.0140	183	1.0151	184	504
290	1.0303	176	1.0313	177	1.0323	179	1.0335	179	522
300	1.0479	173	1.0490	174	1.0502	174	1.0514	176	540
310	1.0652	169	1.0664	170	1.0676	172	1.0690	173	558
320	1.0821	168	1.0834	169	1.0848	169	1.0863	169	576
330	1.0989	163	1.1003	164	1.1017	165	1.1032	166	594
340	1.1152	161	1.1167	162	1.1182	164	1.1198	164	612
350	1.1313	158	1.1329	159	1.1346	159	1.1362	161	630
360	1.1471	157	1.1488	157	1.1505	158	1.1523	158	648
370	1.1628	154	1.1645	155	1.1663	155	1.1681	156	666
380	1.1782	151	1.1800	151	1.1818	152	1.1837	153	684
390	1.1933	149	1.1951	150	1.1970	150	1.1990	150	702
400	1.2082	147	1.2101	147	1.2120	148	1.2140	148	720
410	1.2229	146	1.2248	146	1.2268	146	1.2288	146	738
420	1.2375	143	1.2394	144	1.2414	144	1.2434	144	756
430	1.2518	141	1.2538	141	1.2558	142	1.2578	142	774
440	1.2659	139	1.2679	139	1.2700	139	1.2720	140	792
450	1.2798	137	1.2818	138	1.2839	138	1.2860	138	810
460	1.2935	135	1.2956	135	1.2977	136	1.2998	136	828
470	1.3070	134	1.3091	135	1.3113	135	1.3134	135	846
480	1.3204	132	1.3226	132	1.3248	132	1.3269	132	864
490	1.3336	131	1.3358	131	1.3380	131	1.3401	131	882
500	1.3467	129	1.3489	129	1.3511	129	1.3532	130	900
510	1.3596	128	1.3618	128	1.3640	128	1.3662	128	918
520	1.3724	126	1.3746	126	1.3768	126	1.3790	126	936
530	1.3850	124	1.3872	124	1.3894	124	1.3916	125	954
540	1.3974	124	1.3996	124	1.4018	124	1.4041	123	972
550	1.4098	121	1.4120	121	1.4142	121	1.4164	121	990
560	1.4219	121	1.4241	121	1.4263	121	1.4285	121	1008
570	1.4340	119	1.4362	119	1.4384	119	1.4406	119	1026
580	1.4459	118	1.4481	118	1.4503	118	1.4525	118	1044
590	1.4577	11	1.4599	12	1.4621	12	1.4643	12	1062
600	1.469	12	1.472	11	1.474	12	1.476	12	1080
610	1.481	11	1.483	12	1.486	11	1.488	11	1098
620	1.492	12	1.495	11	1.497	11	1.499	12	1116
630	1.504	11	1.506	11	1.508	12	1.511	11	1134
640	1.515	11	1.517	11	1.520	11	1.522	11	1152
650	1.526		1.528		1.531		1.533		1170

Table 2-7. SOUND VELOCITY AT LOW FREQUENCY IN AIR - Cont.

a/a_0

°K	1 atm		4 atm		7 atm		10 atm		°R
650	1.526	11	1.528	11	1.531	11	1.533	11	1170
660	1.537	11	1.539	11	1.542	11	1.544	11	1188
670	1.548	11	1.550	11	1.553	11	1.555	11	1206
680	1.559	11	1.561	11	1.564	11	1.566	11	1224
690	1.570	10	1.572	11	1.575	11	1.577	10	1242
700	1.580	11	1.583	10	1.586	10	1.587	11	1260
710	1.591	11	1.593	11	1.596	10	1.598	10	1278
720	1.602	10	1.604	10	1.606	10	1.608	11	1296
730	1.612	10	1.614	11	1.616	11	1.619	10	1314
740	1.622	11	1.625	10	1.627	10	1.629	10	1332
750	1.633	10	1.635	10	1.637	10	1.639	10	1350
760	1.643	10	1.645	10	1.647	10	1.649	11	1368
770	1.653	10	1.655	10	1.657	10	1.660	10	1386
780	1.663	10	1.665	10	1.667	10	1.670	10	1404
790	1.673	10	1.675	10	1.677	10	1.680	10	1422
800	1.683	49	1.685	49	1.687	49	1.690	48	1440
850	1.732	47	1.734	47	1.736	47	1.738	47	1530
900	1.779	46	1.781	46	1.783	46	1.785	46	1620
950	1.825	44	1.827	44	1.829	44	1.831	44	1710
1000	1.869	43	1.871	43	1.873	43	1.875	43	1800
1050	1.912	43	1.914	43	1.916	43	1.918	43	1890
1100	1.955	41	1.957	41	1.959	41	1.961	41	1980
1150	1.996	41	1.998	40	2.000	40	2.002	40	2070
1200	2.037	39	2.038	40	2.040	40	2.042	40	2160
1250	2.076	39	2.078	39	2.080	38	2.082	38	2250
1300	2.115	38	2.117	37	2.118	38	2.120	38	2340
1350	2.153	37	2.154	37	2.156	37	2.158	37	2430
1400	2.190	36	2.191	37	2.193	36	2.195	36	2520
1450	2.226	35	2.228	35	2.229	36	2.231	36	2610
1500	2.261	35	2.263	35	2.265	35	2.267	34	2700
1550	2.296	35	2.298	34	2.300	34	2.301	34	2790
1600	2.331	33	2.332	34	2.334	34	2.335	34	2880
1650	2.364	34	2.366	33	2.368	33	2.369	33	2970
1700	2.398	32	2.399	32	2.401	32	2.402	33	3060
1750	2.430	31	2.431	33	2.433	32	2.435	32	3150
1800	2.461	31	2.464	31	2.465	32	2.467	31	3240
1850	2.492	31	2.495	31	2.497	31	2.498	31	3330
1900	2.523	29	2.526	30	2.528	30	2.529	31	3420
1950	2.552	29	2.556	29	2.558	30	2.560	30	3510
2000	2.581	27	2.585	29	2.588	29	2.590	29	3600
2050	2.608	28	2.614	28	2.617	29	2.619	29	3690
2100	2.636	28	2.642	29	2.646	28	2.648	28	3780
2150	2.664	27	2.671	28	2.674	28	2.676	28	3870
2200	2.691	26	2.699	26	2.702	28	2.704	27	3960
2250	2.717	24	2.725	27	2.730	25	2.731	26	4050
2300	2.741	24	2.752	25	2.755	26	2.757	26	4140
2350	2.765	24	2.777	25	2.781	25	2.783	25	4230
2400	2.789	22	2.802	24	2.806	24	2.808	25	4320
2450	2.811	21	2.826	23	2.830	25	2.833	25	4410
2500	2.832	22	2.849	23	2.855	24	2.858	25	4500
2550	2.854	22	2.872	23	2.879	23	2.883	24	4590
2600	2.876	22	2.895	23	2.902	24	2.907	24	4680
2650	2.898	22	2.918	22	2.926	23	2.931	24	4770
2700	2.920	23	2.940	23	2.949	23	2.955	24	4860
2750	2.943	23	2.963	22	2.972	23	2.979	23	4950
2800	2.966	24	2.985	23	2.995	22	3.002	23	5040
2850	2.990	25	3.008	22	3.017	23	3.025	22	5130
2900	3.015	25	3.030	23	3.040	23	3.047	23	5220
2950	3.040	26	3.053	23	3.063	22	3.070	22	5310
3000	3.066		3.076		3.085		3.092		5400

Table 2-7. SOUND VELOCITY AT LOW FREQUENCY IN AIR - Cont.

a/a_0

°K	10 atm		40 atm		70 atm		100 atm		°R
150	.7205	287	.6574	486					270
160	.7492	271	.7060	402					288
170	.7763	257	.7462	351					306
180	.8020	245	.7813	317	.7988	306			324
190	.8265	235	.8130	295	.8294	299			342
200	.8500	229	.8425	271	.8593	270	.9106	185	360
210	.8729	221	.8696	257	.8863	264	.9291	219	378
220	.8950	214	.8953	245	.9127	252	.9510	222	396
230	.9164	208	.9198	233	.9379	241	.9732	219	414
240	.9372	202	.9431	224	.9620	230	.9951	215	432
250	.9574	197	.9655	216	.9850	222	1.0166	212	450
260	.9771	192	.9871	209	1.0072	215	1.0378	206	468
270	.9963	188	1.0080	202	1.0287	206	1.0584	200	486
280	1.0151	184	1.0282	194	1.0493	200	1.0784	195	504
290	1.0335	179	1.0476	192	1.0693	195	1.0979	191	522
300	1.0514	176	1.0668	187	1.0888	189	1.1170	186	540
310	1.0690	173	1.0855	181	1.1077	184	1.1356	181	558
320	1.0863	169	1.1036	177	1.1261	179	1.1537	178	576
330	1.1032	166	1.1213	172	1.1440	175	1.1715	173	594
340	1.1198	164	1.1385	169	1.1615	172	1.1888	168	612
350	1.1362	161	1.1554	166	1.1787	167	1.2056	168	630
360	1.1523	158	1.1720	163	1.1954	164	1.2224	163	648
370	1.1681	156	1.1883	159	1.2118	160	1.2387	158	666
380	1.1837	153	1.2042	156	1.2278	158	1.2545	156	684
390	1.1990	150	1.2198	153	1.2436	154	1.2701	151	702
400	1.2140	148	1.2351	152	1.2590	150	1.2852	150	720
410	1.2288	146	1.2503	148	1.2740	148	1.3002	145	738
420	1.2434	144	1.2651	146	1.2888	146	1.3147	145	756
430	1.2578	142	1.2797	143	1.3034	144	1.3292	142	774
440	1.2720	140	1.2940	140	1.3178	142	1.3434	145	792
450	1.2860	138	1.3080	140	1.3320	140	1.3579	135	810
460	1.2998	136	1.3220	138	1.3460	138	1.3714	138	828
470	1.3134	135	1.3358	136	1.3598	134	1.3852	134	846
480	1.3269	132	1.3494	134	1.3732	134	1.3986	133	864
490	1.3401	131	1.3628	131	1.3866	132	1.4119	130	882
500	1.3532	130	1.3759	130	1.3998	129	1.4249	128	900
510	1.3662	128	1.3889	129	1.4127	129	1.4377	126	918
520	1.3790	126	1.4018	126	1.4256	126	1.4503	125	936
530	1.3916	125	1.4144	124	1.4382	124	1.4628	124	954
540	1.4041	123	1.4268	124	1.4506	122	1.4752	122	972
550	1.4164	121	1.4392	122	1.4628	122	1.4874	120	990
560	1.4285	121	1.4514	121	1.4750	120	1.4994	119	1008
570	1.4406	119	1.4635	119	1.4870	119	1.5113	117	1026
580	1.4525	118	1.4754	118	1.4989	118	1.5230	116	1044
590	1.4643	12	1.4872	12	1.5107	11	1.5346	11	1062
600	1.476	12	1.499	11	1.522	11	1.546	11	1080
610	1.488	11	1.510	11	1.533	12	1.557	12	1098
620	1.499	12	1.521	12	1.545	11	1.569	11	1116
630	1.511	11	1.533	11	1.556	11	1.580	11	1134
640	1.522	11	1.544	11	1.567	11	1.591	11	1152
650	1.533	11	1.555	11	1.578	11	1.602	11	1170
660	1.544	11	1.566	11	1.589	11	1.613	10	1188
670	1.555	11	1.577	11	1.600	11	1.623	11	1206
680	1.566	11	1.588	11	1.611	11	1.634	10	1224
690	1.577	10	1.599	10	1.622	10	1.644	11	1242
700	1.587		1.609		1.632		1.655		1260

Table 2-7. SOUND VELOCITY AT LOW FREQUENCY IN AIR - Cont. a/a_0

°K	10 atm		40 atm		70 atm		100 atm		°R
700	1.587	11	1.609	11	1.632	10	1.655	10	1260
710	1.598	10	1.620	10	1.642	10	1.665	10	1278
720	1.608	11	1.630	10	1.652	11	1.675	11	1296
730	1.619	10	1.640	10	1.663	10	1.686	10	1314
740	1.629	10	1.650	11	1.673	10	1.696	10	1332
750	1.639	10	1.661	10	1.683	10	1.706	10	1350
760	1.649	11	1.671	10	1.693	10	1.716	10	1368
770	1.660	10	1.681	10	1.703	10	1.726	9	1386
780	1.670	10	1.691	10	1.713	10	1.735	10	1404
790	1.680	10	1.701	10	1.723	10	1.745	9	1422
800	1.690	48	1.711	49	1.733	48	1.754	48	1440
850	1.738	47	1.760	47	1.781	46	1.802	45	1530
900	1.785	46	1.807	45	1.827	45	1.847	45	1620
950	1.831	44	1.852	44	1.872	44	1.892	44	1710
1000	1.875	43	1.896	43	1.916	42	1.936	42	1800
1050	1.918	43	1.939	41	1.958	42	1.978	42	1890
1100	1.961	41	1.980	41	2.000	41	2.020	40	1980
1150	2.002	40	2.021	40	2.041	39	2.060	40	2070
1200	2.042	40	2.061	39	2.080	39	2.100	39	2160
1250	2.082	38	2.100	39	2.119	38	2.139	38	2250
1300	2.120	38	2.139	37	2.157	39	2.177	37	2340
1350	2.158	37	2.176	37	2.196	35	2.214	36	2430
1400	2.195	36	2.213	36	2.231	36	2.250	36	2520
1450	2.231	36	2.249	35	2.267	36	2.286	35	2610
1500	2.267	34	2.284	35	2.303	34	2.321	34	2700
1550	2.301	34	2.319	33	2.337	33	2.355	34	2790
1600	2.335	34	2.352	33	2.370	33	2.389	33	2880
1650	2.369	33	2.385	33	2.303	33	2.422	33	2970
1700	2.402	33	2.418	34	2.436	33	2.455	32	3060
1750	2.435	32	2.452	34	2.469	33	2.487	31	3150
1800	2.467	31	2.486	33	2.502	32	2.518	31	3240
1850	2.498	31	2.519	32	2.534	31	2.549	31	3330
1900	2.529	31	2.551	31	2.565	30	2.580	30	3420
1950	2.560	30	2.582	30	2.595	30	2.610	29	3510
2000	2.590	29	2.612	30	2.625	29	2.639	28	3600
2050	2.619	29	2.642	29	2.654	31	2.667	30	3690
2100	2.648	28	2.671	28	2.685	28	2.697	28	3780
2150	2.676	28	2.699	27	2.713	28	2.725	28	3870
2200	2.704	27	2.726	28	2.741	28	2.753	28	3960
2250	2.731	26	2.754	27	2.769	27	2.781	27	4050
2300	2.757	26	2.781	26	2.796	27	2.808	27	4140
2350	2.783	25	2.807	26	2.823	26	2.835	26	4230
2400	2.808	25	2.833	26	2.849	27	2.861	26	4320
2450	2.833	25	2.859	26	2.876	25	2.887	26	4410
2500	2.858	25	2.885	26	2.901	26	2.913	25	4500
2550	2.883	24	2.911	25	2.927	25	2.938	25	4590
2600	2.907	24	2.936	25	2.952	25	2.963	25	4680
2650	2.931	24	2.961	26	2.977	26	2.988	25	4770
2700	2.955	24	2.987	24	3.003	24	3.013	25	4860
2750	2.979	23	3.011	24	3.027	25	3.038	24	4950
2800	3.002	23	3.035	24	3.052	23	3.062	24	5040
2850	3.025	22	3.059	22	3.075	23	3.086	23	5130
2900	3.047	23	3.081	23	3.098	22	3.109	22	5220
2950	3.070	22	3.104	21	3.120	22	3.131	21	5310
3000	3.092		3.125		3.142		3.152		5400

Table 2-8. VISCOSITY OF AIR AT ATMOSPHERIC PRESSURE

°K	η/η_0		°R
100	.4038	410	180
110	.4448	400	198
120	.4848	391	216
130	.5239	382	234
140	.5621	373	252
150	.5994	365	270
160	.6359	357	288
170	.6716	349	306
180	.7065	342	324
190	.7407	335	342
200	.7742	328	360
210	.8070	321	378
220	.8391	315	396
230	.8706	309	414
240	.9015	304	432
250	.9319	298	450
260	.9617	292	468
270	.9909	29	486
280	1.020	28	504
290	1.048	28	522
300	1.076	27	540
310	1.103	27	558
320	1.130	27	576
330	1.157	26	594
340	1.183	26	612
350	1.209	25	630
360	1.234	25	648
370	1.259	24	666
380	1.283	25	684
390	1.308	24	702
400	1.332	24	720
410	1.356	23	738
420	1.379	23	756
430	1.402	23	774
440	1.425	23	792
450	1.448	22	810
460	1.470	21	828
470	1.491	22	846
480	1.513	21	864
490	1.534	22	882
500	1.556	21	900
510	1.577	21	918
520	1.598	21	936
530	1.619	21	954
540	1.640	20	972
550	1.660	20	990
560	1.680	20	1008
570	1.700	20	1026
580	1.720	19	1044
590	1.739	19	1062
600	1.758		1080

°K	η/η_0		°R
600	1.758	19	1080
610	1.777	19	1098
620	1.796	19	1116
630	1.815	19	1134
640	1.834	18	1152
650	1.852	18	1170
660	1.870	18	1188
670	1.888	18	1206
680	1.906	18	1224
690	1.924	18	1242
700	1.942	17	1260
710	1.959	18	1278
720	1.977	17	1296
730	1.994	18	1314
740	2.012	17	1332
750	2.029	17	1350
760	2.046	17	1368
770	2.063	17	1386
780	2.080	16	1404
790	2.096	16	1422
800	2.112	16	1440
810	2.128	17	1458
820	2.145	16	1476
830	2.161	16	1494
840	2.177	16	1512
850	2.193	16	1530
860	2.209	16	1548
870	2.225	15	1566
880	2.240	16	1584
890	2.256	15	1602
900	2.271	15	1620
910	2.286	15	1638
920	2.301	15	1656
930	2.316	15	1674
940	2.331	15	1692
950	2.346	16	1710
960	2.362	15	1728
970	2.377	14	1746
980	2.391	15	1764
990	2.406	14	1782
1000	2.420	15	1800
1010	2.435	15	1818
1020	2.450	14	1836
1030	2.464	14	1854
1040	2.478	14	1872
1050	2.492	14	1890
1060	2.506	14	1908
1070	2.520	14	1926
1080	2.534	14	1944
1090	2.548	14	1962
1100	2.562		1980

°K	η/η_0		°R
1100	2.562	14	1980
1110	2.576	13	1998
1120	2.589	13	2016
1130	2.602	14	2034
1140	2.616	13	2052
1150	2.629	13	2070
1160	2.642	14	2088
1170	2.656	13	2106
1180	2.669	14	2124
1190	2.683	13	2142
1200	2.696	13	2160
1210	2.709	13	2178
1220	2.722	13	2196
1230	2.735	12	2214
1240	2.747	13	2232
1250	2.760	13	2250
1260	2.773	13	2268
1270	2.786	13	2286
1280	2.799	13	2304
1290	2.812	12	2322
1300	2.824	13	2340
1310	2.837	12	2358
1320	2.849	13	2376
1330	2.862	12	2394
1340	2.874	12	2412
1350	2.886	12	2430
1360	2.898	13	2448
1370	2.911	12	2466
1380	2.923	12	2484
1390	2.935	12	2502
1400	2.947	13	2520
1410	2.960	12	2538
1420	2.972	12	2556
1430	2.984	11	2574
1440	2.995	12	2592
1450	3.007	12	2610
1460	3.019	12	2628
1470	3.031	11	2646
1480	3.042	12	2664
1490	3.054	12	2682
1500	3.066	114	2700
1600	3.180	110	2880
1700	3.290	107	3060
1800	3.397	104	3240
1900	3.501		3420

Table 2-9. THERMAL CONDUCTIVITY OF AIR AT ATMOSPHERIC PRESSURE

°K	k/k_0		°R
80	.3092	367	144
90	.3459	372	162
100	.3831	372	180
110	.4203	373	198
120	.4576	372	216
130	.4948	370	234
140	.5318	369	252
150	.5687	365	270
160	.6052	366	288
170	.6418	362	306
180	.6780	358	324
190	.7138	356	342
200	.7494	352	360
210	.7846	350	378
220	.8196	347	396
230	.8543	342	414
240	.8885	340	432
250	.9225	336	450
260	.9561	333	468
270	.9894	33	486
280	1.022	33	504
290	1.055	32	522
300	1.087	32	540
310	1.119	32	558
320	1.151	31	576
330	1.182	31	594
340	1.213	31	612
350	1.244	31	630
360	1.275	30	648
370	1.305	30	666
380	1.335	30	684
390	1.365	29	702
400	1.394	29	720
410	1.423	29	738
420	1.452	29	756
430	1.481	28	774
440	1.509	28	792
450	1.537	28	810
460	1.565	28	828
470	1.593	27	846
480	1.620	27	864
490	1.647	27	882
500	1.674	27	900
510	1.701	26	918
520	1.727	26	936
530	1.753	26	954
540	1.779	26	972
550	1.805	26	990
560	1.831	25	1008
570	1.856	25	1026
580	1.881	25	1044
590	1.906	25	1062
600	1.931		1080

°K	k/k_0		°R
600	1.931	25	1080
610	1.956	24	1098
620	1.980	24	1116
630	2.004	24	1134
640	2.028	24	1152
650	2.052	24	1170
660	2.076	24	1188
670	2.100	23	1206
680	2.123	23	1224
690	2.146	23	1242
700	2.169	23	1260
710	2.192	22	1278
720	2.214	23	1296
730	2.237	22	1314
740	2.259	23	1332
750	2.282	22	1350
760	2.304	22	1368
770	2.326	22	1386
780	2.348	22	1404
790	2.370	22	1422
800	2.392	21	1440
810	2.413	21	1458
820	2.434	22	1476
830	2.456	21	1494
840	2.477	21	1512
850	2.498	20	1530
860	2.518	21	1548
870	2.539	20	1566
880	2.559	21	1584
890	2.580	20	1602
900	2.600	20	1620
910	2.620	20	1638
920	2.640	21	1656
930	2.661	20	1674
940	2.681	20	1692
950	2.701	19	1710
960	2.720	20	1728
970	2.740	19	1746
980	2.759	20	1764
990	2.779	19	1782
1000	2.798		1800

Table 2-10. PRANDTL NUMBER OF AIR AT ATMOSPHERIC PRESSURE $\eta C_p/k$

°K	(N_{Pr})		$(N_{Pr})^{2/3}$		$(N_{Pr})^{1/3}$		$(N_{Pr})^{1/2}$		°R
100	.770	-4	.841	-4	.916	-1	.877	-2	180
120	.766	-5	.837	-3	.915	-2	.875	-3	216
140	.761	-7	.834	-6	.913	-3	.872	-4	252
160	.754	-8	.828	-6	.910	-3	.868	-4	288
180	.746	-7	.822	-5	.907	-3	.864	-4	324
200	.739	-7	.817	-5	.904	-3	.860	-4	360
220	.732	-7	.812	-5	.901	-3	.856	-5	396
240	.725	-6	.807	-5	.898	-2	.851	-3	432
260	.719	-6	.802	-4	.896	-3	.848	-4	468
280	.713	-5	.798	-3	.893	-2	.844	-3	504
300	.708	-5	.795	-4	.891	-2	.841	-3	540
320	.703	-4	.791	-3	.889	-2	.838	-2	576
340	.699	-4	.788	-4	.887	-1	.836	-2	612
360	.695	-4	.784	-2	.886	-2	.834	-3	648
380	.691	-2	.782	-2	.884	-1	.831	-1	684
400	.689	-3	.780	-2	.883	-1	.830	-2	720
420	.686	-2	.778	-2	.882	-1	.828	-1	756
440	.684	-1	.776	-1	.881		.827	-1	792
460	.683	-2	.775	-1	.881	-1	.826	-1	828
480	.681	-1	.774		.880	-1	.825		864
500	.680		.774		.879		.825		900
520	.680		.774		.879		.825		936
540	.680		.774		.879		.825		972
560	.680		.774		.879		.825		1008
580	.680		.774		.879		.825		1044
600	.680	1	.774		.879	1	.825		1080
620	.681	1	.774	1	.880		.825	1	1116
640	.682		.775		.880		.826		1152
660	.682	1	.775		.880	1	.826		1188
680	.683	1	.775	1	.881		.826	1	1224
700	.684	1	.776	1	.881	1	.827	1	1260
720	.685	1	.777	1	.882		.828		1296
740	.686	1	.778	1	.882		.828	1	1332
760	.687	1	.779		.882	1	.829	1	1368
780	.688	1	.779	1	.883		.830		1404
800	.689	1	.780	1	.883	1	.830	1	1440
820	.690	2	.781	2	.884		.831	1	1476
840	.692	1	.783		.884	1	.832		1512
860	.693	2	.783	1	.885	1	.832	2	1548
880	.695	1	.784	1	.886		.834		1584
900	.696	1	.785	1	.886	1	.834	1	1620
920	.697	1	.786	1	.887		.835		1656
940	.698	2	.787	1	.887	1	.835	2	1692
960	.700	1	.788	1	.888		.837		1728
980	.701	1	.789	1	.888	1	.837	1	1764
1000	.702		.790		.889		.838		1800

Table 2-11. IDEAL-GAS THERMODYNAMIC FUNCTIONS FOR AIR

°K	$\frac{C_p^\circ}{R}$		$\frac{(H^\circ - E_0^\circ)}{RT_0}$ *		$\frac{S^\circ}{R}$		°R
10	3.5009	- 68	.1238	1280	12.0382	24240	18
20	3.4941	- 15	.2518	1278	14.4622	14126	36
30	3.4926	- 8	.3796	1279	15.8748	10084	54
40	3.4918	- 3	.5075	1278	16.8832	7801	72
50	3.4915	- 1	.6353	1278	17.6633	6357	90
60	3.4914		.7631	1278	18.2990	5377	108
70	3.4914	- 1	.8909	1279	18.8367	4667	126
80	3.4913		1.0188	1278	19.3034	4111	144
90	3.4913		1.1466	1278	19.7145	3679	162
100	3.4913	1	1.2744	1278	20.0824	3328	180
110	3.4914		1.4022	1278	20.4152	3038	198
120	3.4914		1.5300	1278	20.7190	2794	216
130	3.4914		1.6578	1278	20.9984	2588	234
140	3.4914	1	1.7856	1278	21.2572	2408	252
150	3.4915	1	1.9134	1279	21.4980	2254	270
160	3.4916		2.0413	1278	21.7234	2117	288
170	3.4916	1	2.1691	1278	21.9351	1995	306
180	3.4917	2	2.2969	1278	22.1346	1888	324
190	3.4919	3	2.4247	1279	22.3234	1792	342
200	3.4922	2	2.5526	1278	22.5026	1703	360
210	3.4924	3	2.6804	1279	22.6729	1625	378
220	3.4927	5	2.8083	1279	22.8354	1553	396
230	3.4932	5	2.9362	1279	22.9907	1487	414
240	3.4937	8	3.0641	1279	23.1394	1426	432
250	3.4945	8	3.1920	1279	23.2820	1371	450
260	3.4953	10	3.3199	1280	23.4191	1319	468
270	3.4963	12	3.4479	1280	23.5510	1272	486
280	3.4975	14	3.5759	1281	23.6782	1227	504
290	3.4989	16	3.7040	1281	23.8009	1187	522
300	3.5005	19	3.8321	1282	23.9196	1148	540
310	3.5024	20	3.9603	1282	24.0344	1112	558
320	3.5044	24	4.0885	1284	24.1456	1079	576
330	3.5068	25	4.2169	1284	24.2535	1047	594
340	3.5093	29	4.3453	1285	24.3582	1018	612
350	3.5122	31	4.4738	1286	24.4600	990	630
360	3.5153	33	4.6024	1288	24.5590	963	648
370	3.5186	38	4.7312	1289	24.6553	939	666
380	3.5224	39	4.8601	1290	24.7492	916	684
390	3.5263	42	4.9891	1291	24.8408	893	702
400	3.5305	44	5.1182	1294	24.9301	872	720
410	3.5349	48	5.2476	1295	25.0173	853	738
420	3.5397	50	5.3771	1296	25.1026	833	756
430	3.5447	52	5.5067	1299	25.1859	816	774
440	3.5499	56	5.6366	1301	25.2675	798	792
450	3.5555	58	5.7667	1302	25.3473	782	810
460	3.5613	60	5.8969	1305	25.4255	767	828
470	3.5673	62	6.0274	1307	25.5022	751	846
480	3.5735	64	6.1581	1310	25.5773	738	864
490	3.5799	66	6.2891	1311	25.6511	724	882
500	3.5865	68	6.4202	1315	25.7235	711	900
510	3.5933	70	6.5517	1316	25.7946	698	918
520	3.6003	72	6.6833	1320	25.8644	686	936
530	3.6075	74	6.8153	1322	25.9330	675	954
540	3.6149	75	6.9475	1324	26.0005	664	972
550	3.6224	76	7.0799	1328	26.0669	654	990
560	3.6300	77	7.2127	1330	26.1323	643	1008
570	3.6377	79	7.3457	1333	26.1966	633	1026
580	3.6456	79	7.4790	1336	26.2599	624	1044
590	3.6535	80	7.6126	1339	26.3223	615	1062
600	3.6615		7.7465		26.3838		1080

* The enthalpy function is divided here by a constant RT_0 where $T_0 = 273.16°K$ (491.688°R).

Table 2-11. IDEAL-GAS THERMODYNAMIC FUNCTIONS FOR AIR - Cont.

°K	$\frac{C_p^\circ}{R}$		$\frac{(H^\circ - E_0^\circ)^*}{RT_0}$		$\frac{S^\circ}{R}$		°R
600	3.6615	81	7.7465	1342	26.3838	606	1080
610	3.6696	82	7.8807	1345	26.4444	597	1098
620	3.6778	82	8.0152	1348	26.5041	589	1116
630	3.6860	83	8.1500	1351	26.5630	581	1134
640	3.6943	84	8.2851	1354	26.6211	574	1152
650	3.7027	84	8.4205	1357	26.6785	566	1170
660	3.7111	84	8.5562	1360	26.7351	559	1188
670	3.7195	84	8.6922	1363	26.7910	551	1206
680	3.7279	84	8.8285	1366	26.8461	545	1224
690	3.7363	84	8.9651	1370	26.9006	538	1242
700	3.7447	84	9.1021	1372	26.9544	532	1260
710	3.7531	83	9.2393	1375	27.0076	525	1278
720	3.7614	84	9.3768	1379	27.0601	520	1296
730	3.7698	84	9.5147	1381	27.1121	513	1314
740	3.7782	83	9.6528	1385	27.1634	508	1332
750	3.7865	82	9.7913	1388	27.2142	502	1350
760	3.7947	83	9.9301	1391	27.2644	497	1368
770	3.8030	82	10.0692	1393	27.3141	491	1386
780	3.8112	82	10.2085	1397	27.3632	486	1404
790	3.8194	81	10.3482	1400	27.4118	481	1422
800	3.8275	395	10.4882	7042	27.4599	2332	1440
850	3.8670	379	11.1924	7113	27.6931	2221	1530
900	3.9049	360	11.9037	7181	27.9152	2121	1620
950	3.9409	341	12.6218	7245	28.1273	2030	1710
1000	3.9750	320	13.3463	7306	28.3303	1947	1800
1050	4.0070	301	14.0769	7362	28.5250	1871	1890
1100	4.0371	282	14.8131	7416	28.7121	1801	1980
1150	4.0653	264	15.5547	7466	28.8922	1736	2070
1200	4.0917	249	16.3013	7512	29.0658	1675	2160
1250	4.1166	232	17.0525	7557	29.2333	1620	2250
1300	4.1398	217	17.8082	7597	29.3953	1566	2340
1350	4.1615	205	18.5679	7636	29.5519	1517	2430
1400	4.1820	192	19.3315	7673	29.7036	1471	2520
1450	4.2012	181	20.0988	7707	29.8507	1428	2610
1500	4.2193	171	20.8695	7739	29.9935	1386	2700
1550	4.2364	161	21.6434	7769	30.1321	1348	2790
1600	4.2525	153	22.4203	7798	30.2669	1310	2880
1650	4.2678	145	23.2001	7825	30.3979	1276	2970
1700	4.2823	139	23.9826	7852	30.5255	1244	3060
1750	4.2962	131	24.7678	7875	30.6499	1212	3150
1800	4.3093	125	25.5553	7900	30.7711	1182	3240
1850	4.3218	119	26.3453	7922	30.8893	1154	3330
1900	4.3337	115	27.1375	7943	31.0047	1128	3420
1950	4.3452	109	27.9318	7963	31.1175	1101	3510
2000	4.3561	105	28.7281	7983	31.2276	1077	3600
2050	4.3666	101	29.5264	8003	31.3353	1054	3690
2100	4.3767	97	30.3267	8020	31.4407	1031	3780
2150	4.3864	94	31.1287	8037	31.5438	1009	3870
2200	4.3958	90	31.9324	8055	31.6447	989	3960
2250	4.4048	87	32.7379	8070	31.7436	969	4050
2300	4.4135	84	33.5449	8087	31.8405	950	4140
2350	4.4219	82	34.3536	8101	31.9355	932	4230
2400	4.4301	79	35.1637	8117	32.0287	914	4320
2450	4.4380	76	35.9754	8130	32.1201	898	4410
2500	4.4456	74	36.7884	8144	32.2099	881	4500
2550	4.4530		37.6028		32.2980		4590

*The enthalpy function is divided here by a constant RT_0 where T_0 = 273.16°K (491.688°R).

Table 2-11. IDEAL-GAS THERMODYNAMIC FUNCTIONS FOR AIR - Cont.

°K	$\frac{C_p^\circ}{R}$		$\frac{(H^\circ - E_0^\circ)^*}{RT_o}$		$\frac{S^\circ}{R}$		°R
2550	4.4530	72	37.6028	8158	32.2980	865	4590
2600	4.4602	70	38.4186	8171	32.3845	850	4680
2650	4.4672	68	39.2357	8183	32.4695	836	4770
2700	4.4740	67	40.0540	8195	32.5531	822	4860
2750	4.4807	64	40.8735	8208	32.6353	807	4950
2800	4.4871	62	41.6943	8219	32.7160	795	5040
2850	4.4933	61	42.5162	8230	32.7955	782	5130
2900	4.4994	59	43.3392	8241	32.8737	770	5220
2950	4.5053	56	44.1633	8251	32.9507	757	5310
3000	4.5109		44.9884		33.0264		5400

*The enthalpy function is divided here by a constant RT_0 where $T_0 = 273.16^\circ K$ (491.688°R).

Table 2-12. COEFFICIENTS FOR THE EQUATION OF STATE FOR AIR

$$Z = \frac{PV}{RT} = 1 + \frac{B}{V} + \frac{C}{V^2} + \frac{D}{V^3}$$

T	B	C	D x10^{-4}
°K	cm^3/mole	cm^6/mole^2	cm^9/mole^3
50	-527.60		
60	-374.38		
70	-284.27		
80	-225.30		
90	-183.83	-6825.8	
100	-153.15	-3253.5	+9.40
110	-129.56	-1377.4	8.86
120	-110.87	- 314.0	8.34
130	- 95.73	+ 316.3	7.85
140	- 83.20	602.5	7.40
150	- 72.681	944.9	7.00
160	- 63.729	1099.1	6.63
170	- 56.020	1197.9	6.30
180	- 49.316	1260.8	6.00
190	- 43.436	1300.0	5.72
200	- 38.241	1323.5	5.46
210	- 33.617	1336.1	5.23
220	- 29.479	1341.5	5.00
230	- 25.754	1341.7	4.78
240	- 22.386	1338.5	4.56
250	- 19.327	1332.7	4.36
260	- 16.537	1325.3	4.17
270	- 13.982	1316.9	3.98
280	- 11.637	1308.0	3.80
290	- 9.475	1298.3	3.63
300	- 7.480	1288.5	3.46
310	- 5.629	1278.4	3.31
320	- 3.911	1268.4	3.16
330	- 2.310	1258.6	3.02
340	- 0.820	1248.8	2.88

T	B	C	D x10^{-4}
°K	cm^3/mole	cm^6/mole^2	cm^9/mole^3
350	+ 0.575	+ 1239.1	+ 2.75
360	1.882	1230.4	2.62
370	3.108	1220.7	2.49
380	4.260	1211.5	2.37
390	5.344	1202.8	2.26
400	6.367	1194.2	2.16
410	7.332	1185.8	2.07
420	8.243	1177.6	1.98
430	9.107	1169.7	1.89
440	9.924	1162.0	1.80
450	10.701	1154.4	1.72
460	11.438	1147.0	1.65
470	12.139	1139.8	1.58
480	12.806	1132.8	1.52
490	13.442	1126.0	1.46
500	14.048	1119.2	1.40
550	16.691	1088.2	1.30
600	18.826	1060.3	0.89
650	20.573	1034.9	0.62
700	22.024	1011.7	0.52
750	23.241	990.4	0.4
800	24.271	970.99	0.3
850	25.151	952.20	
900	25.907	935.40	
950	26.561	919.47	
1000	27.129	904.30	
1100	28.061	876.91	
1200	28.765	851.64	
1300	29.344	829.03	
1400	29.788	808.33	
1500	30.138	789.45	