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THE THERMODYNAMIC PROPERTIES OF OXYGEN AND NITROGEN

PART I - THERMODYNAMIC PROPERTIES
OF NITROGEN FROM 115 R TO 3500 R
WITH PRESSURES TO 150,000 PSIA.

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Systems Management Branch
Houston, Texas 77058

ABSTRACT
(PART I)

An equation of state, $P = P(\rho, T)$, is presented for liquid and gaseous nitrogen for temperatures from 115 R to 3500 R and pressures to 150,000 psia. All of the Pressure-Density-Temperature (P - ρ - T) data available from the published literature have been reviewed, and appropriate corrections have been identified and applied to bring experimental temperatures into accord with the International Practical Temperature Scale of 1968. Comparisons of property values calculated from the equation of state to measured values are included to illustrate the accuracy of the equation in representing the data. The coefficients of the equation of state were determined by a weighted least squares fit to selected published P - ρ - T data and, simultaneously, to C_v data determined by corresponding states analysis from oxygen data, and to data which define the phase equilibrium criteria for the saturated liquid and saturated vapor. The methods of weighting the various data for simultaneous fitting are presented and discussed.

A vapor pressure equation, melting curve equation, and an equation to represent the ideal gas heat capacity, are also presented. Comparisons of measurements of various thermodynamic properties with values calculated using the equation of state, and the vapor pressure equation and ideal gas heat capacity equation, as appropriate, are included. (e.g., specific heats, enthalpy, latent heat of vaporization, entropy of the saturated liquid, and velocity of sound.)

The extrapolation of the equation of state to the saturated liquid line and to the melting curve are discussed, and comparisons to the available measurements of density at these conditions are included. Extrapolation of the equation of state to higher and lower temperatures for the vapor is discussed.

The equation of state is estimated to be accurate to within 0.5 percent in the liquid region, to within 0.1 percent for supercritical isotherms up to 15,000 psia, and to within 0.3 percent from 15,000 to 150,000 psia. The vapor pressure equation is accurate to within ± 0.01 K between the triple point and the critical point. Tables of calculated thermodynamic properties of nitrogen are presented including values of temperature, density, internal energy, enthalpy, entropy, specific heat at constant volume, specific heat at constant pressure, the isotherm derivative, the isochore derivative, and velocity of sound along selected isobars. A table of the thermodynamic properties of nitrogen at saturation is included. Additional tables of functions for heat transfer calculations are also included.

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INTRODUCTION*

The Consumables Analysis Section of the Systems Management Branch at the NASA-Manned Spacecraft Center has used the equation of state developed by Stewart^{1**} in three of its system computer models. The oxygen equation of state by Stewart has also been used extensively by the NASA Computational Fluid Dynamics Branch.² Although the more recent thermodynamic property tables published by the National Bureau of Standards, Cryogenics Division³ were considered to be more accurate than the values by Stewart, the thermodynamic property calculation procedure used by Stewart was better suited for computer applications in thermodynamic modeling and simulation. A comparison of the NBS tables and the tables published by Stewart also indicated that the differences in these property tables could be considered negligible in the applications for which they were used.

In the Apollo program, the equation of state and the isotherm derivative, $(\partial P / \partial p)_T$, are the most useful functions employed in both the pre-mission and mission support activities. However, in Skylab analyses the vapor pressure and heat capacity values are also necessary to accurately account for venting rates.

In addition, advanced NASA programs, including Skylab and Space Shuttle, will employ a two gas (i.e., oxygen-nitrogen) atmosphere. It was fortuitous that a research group at the University of Idaho under the direction of R.B. Stewart^{4 5 6 7} had been working since July, 1969, on a new formulation for thermodynamic property tables for nitrogen, and was using an equation of state for nitrogen similar to the earlier equation for oxygen

*This final report on Contract NAS 9-12078 with the NASA-Manned Spacecraft Center, Systems Management Branch, is issued in two parts, as follows:

Part I - Thermodynamic Properties of Nitrogen from 115 R to 3500 R with Pressures to 150,000 Psia.

Part II- Thermodynamic Properties of Oxygen from 100 R to 600 R with Pressures to 5000 Psia.

This introduction is included in both Parts I and II.

**Numerical superscripts refer to references at the end of this Introduction.

by Stewart¹. It was, therefore, considered that the continuation of the nitrogen thermodynamic property studies at the University of Idaho, and a review and revision of the earlier work on the properties of oxygen by R.B. Stewart and his colleagues would be of benefit to the NASA programs.

On July 1, 1971, this study was initiated with the objectives to (1) improve and extend the range of the equation of state for oxygen (as reported by Stewart¹), (2) to develop a single equation of state for both nitrogen and oxygen, and (3) to develop computer programs incorporating these new equations to be used in all of the NASA space programs.

During the course of the work on the contract with NASA-MSC, three Progress Reports have been issued, as follows:

1. *An Equation of State for Oxygen and Nitrogen*, R.B. Stewart, R.T. Jacobsen, and A.F. Myers, University of Idaho, Engineering Experiment Station, Research Report, No. 13 (Oct. 1, 1971).
2. *An Equation of State for Oxygen and Nitrogen II*, R.B. Stewart, R.T. Jacobsen, and A.F. Myers, University of Idaho, Engineering Experiment Station, Progress Report (Jan. 1, 1972).
3. *Thermodynamic Properties of Oxygen and Nitrogen III*, R.B. Stewart, R.T. Jacobsen, and A.F. Myers, University of Idaho, Engineering Experiment Station, Progress Report (April 1, 1972).

In addition, the project has benefited from the preparation of a Ph.D. thesis,

R.T. Jacobsen, *The Thermodynamic Properties of Nitrogen from 65 K to 2000 K with Pressures to 10,000 Atm.*, Ph.D. Thesis, Washington State University (June 1972).

Dr. Jacobsen was employed part time on this project, but had a deeper commitment to the work since it paralleled the research which was the basis for his thesis. As a consequence, Dr. Jacobsen worked countless hours on this study beyond his commitments to the project, and the results of his efforts have been incorporated as a part of this project. Copies of Dr. Jacobsen's thesis were also distributed to the NASA Technical Monitor and all others on the distribution list for the Quarterly Progress Reports. The association of Dr. Jacobsen's Ph.D. research also brought Dr. Richard W. Crain, Jr., Associate Professor of Mechanical Engineering at Washington State University, in regular contact with the authors of this report during the course of the studies, and his interest and many suggestions are gratefully acknowledged.

This project is a part of a series of related thermodynamic property studies and contributions of several other studies have contributed to this work. Many of the developments reported here were made as a part of these related studies.

Computer programs for the calculation of the thermodynamic properties, as given in the accompanying thermodynamic property tables, have been supplied separately to the NASA Technical Monitor. These programs provide for the calculation of property values with either pressure and temperature or density and temperature as the input arguments.

The units used for all equations presented here are generally the units for which the majority of the data are published. The tables of thermodynamic properties are in engineering units, as required by the sponsor. The computer programs supplied separately to the NASA Technical Monitor include conversions to calculate thermodynamic properties in engineering units. The following conversion factors may be used for conversions between these two unit systems.

These values have been taken or derived from,

The International System of Units, E.A. Mechtly, National Aeronautics and Space Administration Report Number SP-7012 (1969).

CONVERSION FACTORS

Temperature	$1.8 \text{ R} = 1 \text{ K}$
Pressure	$14.6959 \text{ psia} = 1 \text{ atm}$
	$1.01325 \times 10^5 \text{ N/m}^2 = 1 \text{ atm}$
	$6.89476 \times 10^3 \text{ N/m}^2 = 1 \text{ psia}$
Density	$0.0624280 \text{ lbm/ft}^3 = 1 \text{ g/liter}$
Energy	$101.3278 \text{ joules} = 1 \text{ liter-atm}$
	$1054.350264488 \text{ joules} = 1 \text{ Btu (thermochemical)}$
Mass	$453.59237 \text{ gm} = 1 \text{ lb}$
Velocity of Sound	$3.280839 \text{ ft/sec} = 1 \text{ m/sec}$

MOLECULAR WEIGHTS

Oxygen	31.9988
Nitrogen	28.0134

UNIVERSAL GAS CONSTANT

$$\begin{aligned}
 R &= 8.31434 \text{ joules/g mol-K} = 0.0820539 \text{ liter-atm/g mol-K} \\
 &= 1545.2546 \text{ ft-lbs/lb mol-R}
 \end{aligned}$$

CRITICAL POINT VALUES

Oxygen:

$$\begin{aligned}
 T_c &= 154.581 \text{ K} = 278.246 \text{ R} \\
 P_c &= 49.77 \text{ atm} = 731.417 \text{ psia} \\
 \rho_c &= 13.63 \text{ mol/l} = 27.227 \text{ lbm/ft}^3
 \end{aligned}$$

Nitrogen:

$$\begin{aligned}
 T_c &= 126.20 \text{ K} = 227.16 \text{ R} \\
 P_c &= 33.555 \text{ atm} = 493.123 \text{ psia} \\
 \rho_c &= 11.21 \text{ mol/l} = 19.604 \text{ lbm/ft}^3
 \end{aligned}$$

¹Stewart, R.B., *Thermodynamic Properties of Oxygen*, Ph.D. Thesis, University of Iowa (1966).

²NASA - Computational Fluid Dynamics Branch, Ames Research Center, *Convection in the Tanks of a Rotating Spacecraft*, NASA Technical Report, TR R-386 (June 1972).

³Weber, L.A., *Thermodynamic and Related Properties of Oxygen from the Triple Point to 300 K at Pressures to 330 Atmospheres*, NBS Report 9710 (June 20, 1968).

⁴Coleman, T.C., *The Thermodynamic Properties of Nitrogen*, Ph.D. Thesis, Worcester Polytechnic Institute (1971).

⁵Coleman, T.C. and R.B. Stewart, *The Thermodynamic Properties of Nitrogen*, University of Idaho, Engineering Experiment Station, Research Report No. 11 (Sept. 1, 1970).

⁶Coleman, T.C. and R.B. Stewart, *Thermodynamic Properties of Nitrogen from 70 K to 1000 K with Pressures to 1000 Atm.*, paper presented to the XIII International Congress of Refrigeration, Washington, D.C., (Sept. 1971).

⁷R.B. Stewart and R.T. Jacobsen, *The Thermodynamic Properties of Nitrogen II*, University of Idaho, Engineering Experiment Station, Research Report No. 12 (Sept. 1, 1971).

1. THE P- ρ -T DATA AND VAPOR PRESSURE DATA

P- ρ -T Data

The sources of experimental P- ρ -T data that form the basis of this work are listed in Table 1. This table summarizes the literature in which data are reported for the liquid phase, the vapor phase, the saturated liquid, and the liquid on the freezing line. Unit conversion and temperature scale correction procedures are presented in the following section. Figure 1 is a map of the P- ρ -T data used in the final formulation of the equation of state.

Vapor Pressure Data

The literature reporting measurements of the vapor pressure of nitrogen is summarized in Table 2. Unit conversion and temperature scale correction procedures for these data sets are also discussed in section 2.

Critical Point Parameters

The values of pressure and temperature at the critical point of nitrogen were selected as 33.555 atm. and 126.20 K. These values are consistent with the critical point measurements of White et al. [106]* and with the vapor pressure formulation discussed in Section 4. (The critical pressure and temperature reported in [106] are 33.54 ± 0.02 atm. and 126.26 ± 0.04 degrees Kelvin, respectively.) The critical point density was determined as 11.21 moles/liter by the method of rectilinear diameters using values of saturated liquid and saturated vapor densities calculated by the simultaneous solution of the vapor pressure equation and the equation of state each fit to the appropriate data.

*Numbers in brackets refer to citations in the bibliography.

TABLE 1
SUMMARY OF P- ρ -T DATA FOR NITROGEN

Source	Temperature Range (K)	Pressure Range (atm)	Number of Data Points
Vapor			
Amagat [1]	273 - 473	1 - 1000	73
Amagat [2]	273 - 317	1 - 3000	80
Bartlett [3]	273	1 - 1000	9
Bartlett et al. [4]	273 - 673	1 - 1000	52
Bartlett et al. [5]	203 - 293	100 - 1000	42
Benedict [6]	90 - 273	99 - 1500	25
Benedict [7]	98 - 473	981 - 5879	124
Canfield [8]	133 - 273	2 - 300	152
Crain [9]	143 - 273	2 - 500	90
Friedman [10]	80 - 300	1 - 200	201
Hall and Canfield [11]	103, 113	2 - 9	8
Heuse and Otto [12]	273	0.04 - 0.1	8
Holborn and Otto [13]	273 - 373	20 - 99	32
Holborn and Otto [14]	273 - 673	20 - 99	66
Holborn and Otto [15]	143 - 273	20 - 99	24
Kamerlingh Onnes and van Urk [16]	124 - 293	30 - 50	143
Malbrunot and Vodar [17]	473 - 1273	1000 - 4000	63
Malbrunot [18]	473 - 1273	800 - 5000	191
Michels et al. [19]	273 - 423	20 - 80	56
Michels et al. [20]	273 - 423	200 - 3000	147
Miller et al. [21]	294	9 - 260	10
Otto et al. [22]	298 - 423	45 - 400	63
Robertson and Babb [23]	308 - 673	1600 - 10,000	170
Saurel [24]	423 - 1073	10 - 900	87
Smith and Taylor [25]	273 - 473	34 - 319	40
Townsend [26]	298, 323	2 - 140	35
Tsiklis and Polyakov [27]	294 - 673	1500 - 10,000	69
Tsiklis [28]	323 - 423	3000 - 10,000	45
Verschoyle [29]	273 - 293	25 - 205	36
Liquid			
Cockett et al. [30]	85 - 120	50 - 200	63
Gibbons [31]	72 - 77	22 - 124	17
Golubev and Dobrovolskii [32]	78 - 133	49 - 484	59
Streett and Staveley [33]	77.35 - 120.23	4.32 - 680.46	107
Van Itterbeek and Verbeke [34]	65 - 90	15 - 840	67
Van Itterbeek and Verbeke [35]	77 - 90	79 - 815	13
Weber [36]	80 - 140	30 - 266	76
Saturated Liquid			
Goldman et al. [37]	78 - 125	1 - 32	80
Terry et al [38]	77 - 104	1 - 10	15
Liquid on the Freezing Line			
Grilly and Mills [39]	64 - 120	76 - 3441	10

TABLE 2
SUMMARY OF VAPOR PRESSURE DATA

Source	Temperature Range (K)	Number of Data Points
Armstrong [40]	66 - 77	74
Cath [41]	64 - 84	8
Crommelin [42]	81 - 125	9
Dodge and Davis [43]	78 - 94	15
Friedman and White [44]	77 - 123	19
Giauque and Clayton [45]	54 - 63	9
Keesom and Bijl [46]	65 - 77	18
Michels et al. [47]	96 - 125	10
Moussa et al. [48]	63 - 77	31
Porter and Perry [49]	90 - 121	12
Wagner [49a]	63.152 - 126.20	75
Weber [36]	65 - 126	47

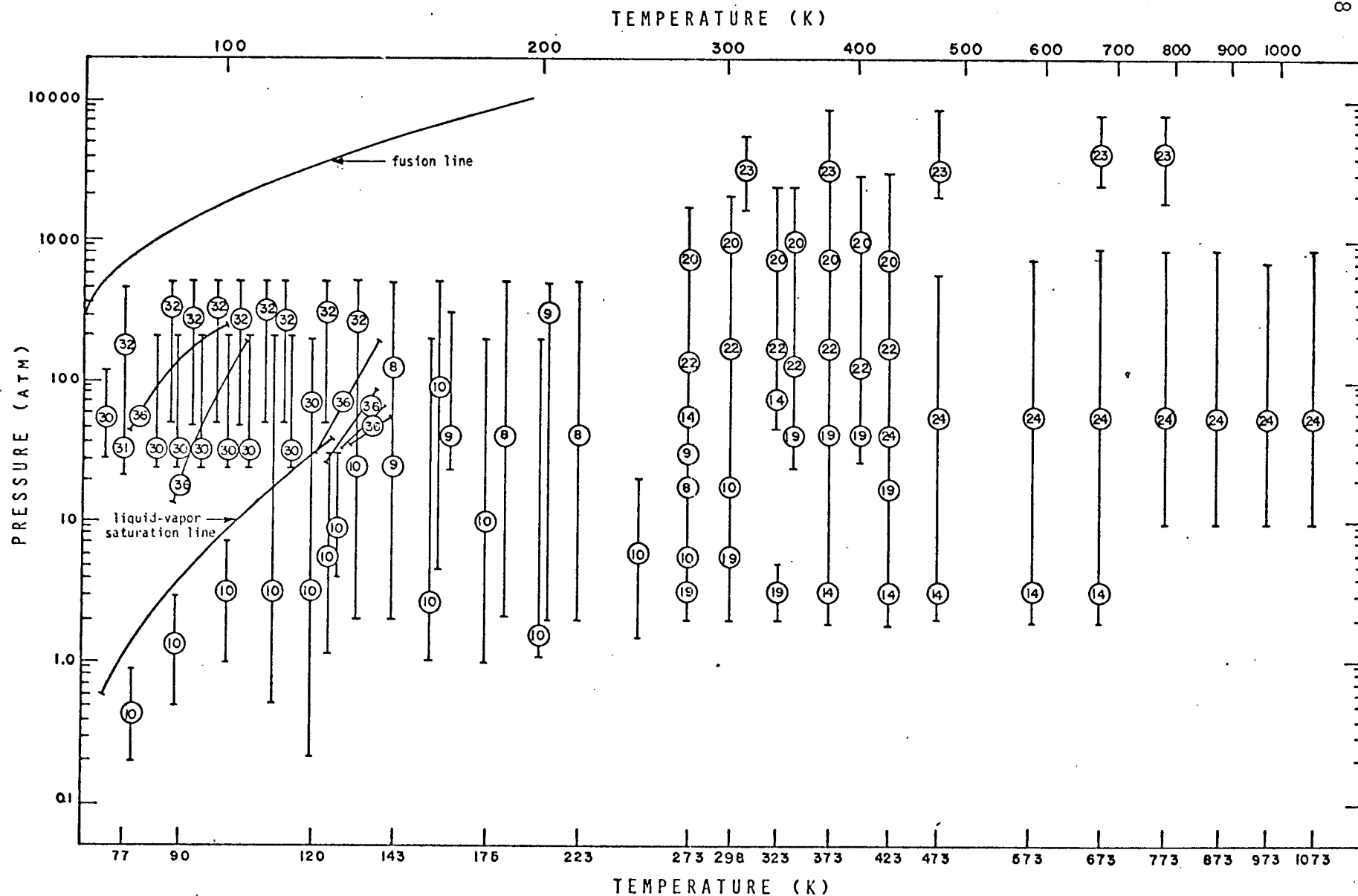


FIGURE 1.-- MAP OF THE P- ρ -T DATA USED IN THE DETERMINATION OF THE EQUATION OF STATE

2. PREPARATION OF DATA FOR USE IN THE LEAST SQUARES FITTING OF THE EQUATION OF STATE AND VAPOR PRESSURE EQUATION

P-ρ-T Data

Weights for the P-ρ-T data for use in the least squares fit in the calculation of the coefficients of the equation of state were determined using root mean square (rms) deviations in pressure as defined by equation (1) along isotherms and isochores.

$$\text{rms} = \frac{[\sum(P_{\text{calc}} - P_{\text{data}})/P_{\text{data}}]^{1/2}}{N} \quad (1)$$

where P_{calc} is the pressure calculated from the appropriate liquid or vapor equation of state, P_{data} is the experimental pressure, and N is the number of data points on the isotherm or isochore. The values of P_{calc} were determined from separate fits of the interim equation reported in [104] to selected data in the liquid and vapor regions.

The weight applied to each data point was calculated from

$$\text{WT} = \frac{1}{(\text{rms} \times P_{\text{data}})} \quad (2)$$

Following the development of the functional form of the equation of state (3) using P-ρ-T data, constant volume specific heat data and data to describe the criteria for liquid-vapor equilibrium were added to the compiled P-ρ-T values and new coefficients for (3) were determined by a simultaneous least squares fit of these related data.

Vapor Pressure Data

For the vapor pressure data, preliminary calculations indicated that an unweighted fit to selected data produced smaller deviations in calculated temperatures from data values than a weighted fit. After a careful investigation of weighting vapor pressure data points using uncertainties in temperature and in pressure, equal weights of unity were assigned to all data values used to determine the coefficients for equation (4).

C_V and Saturation Data

The weights applied to the C_V data and to the saturation data used in fitting phase equilibrium criteria were arbitrary, and were specified to make the effects of each of the data points compatible with P- ρ -T points in the same region of temperature and pressure. The coefficients for equation (3) given in Table 3 were determined by a simultaneous least squares fit of P- ρ -T data weighted using equation (2), to calculated C_V data weighted by the relation, $WT = 10,000/(C_V)^2$, and to phase equilibrium criteria defined by saturation data weighted with the equation, $WT = 100/(P + 0.01)$.

Temperature Scale Corrections

The data sets used in this investigation span the period of the evolution of several interim uniform temperature scales terminating with the adoption of the International Practical Temperature Scale of 1968 (IPTS - 68) by the *Comité International des Poids et Mesures (CIPM)* in October of 1968 [99]. Temperature scale corrections were applied to all experimental data to correct all data temperatures to the IPTS - 68 scale as specified in [88], [89], [95], [97], and [98].

3. THE DETERMINATION OF THE EQUATION OF STATE

Stepwise Multiple Regression Analysis

Although a satisfactory equation of 35 terms had been developed for nitrogen in [104], no systematic procedure had been employed to ascertain that the best 35 terms were used or that 35 was an optimum number of terms. To systematize the choice of terms to be used in the equation of state for nitrogen, a computer program developed for this purpose by G. L. Rose [103] was utilized to analyze a comprehensive equation of state with 50 terms that previous experience had indicated might produce an equation appropriate to describe the P- ρ -T surface. This analysis was designed to determine the relative significance of these selected 50 terms.

The technique of stepwise multiple regression was utilized to fit selected P- ρ -T data for nitrogen. The first term for the equation was selected as one which had the highest correlation coefficient for the data used. The second term was chosen from among the remaining terms to provide the highest correlation coefficient for two terms including the first term as selected above. This procedure was continued until all 50 terms with undetermined coefficients had been utilized in the final fit.

The fitting process was then repeated with 45 terms by deleting the five terms which had the lowest F-statistics of the group of 50, and repeated again with 43 terms after the deletion of two more terms with the least significant F-values. To eliminate further terms which had small or negligible contributions to the fit, the analysis of the F-statistics of the coefficients was continued by deleting one term with each successive fit. This procedure was continued until an equation was obtained with only one term with an F-statistic below the value for significance at the one percent level. This resulted in equation (3), which, when fit to the P- ρ -T data for the entire range of available measurements, had 31 coefficients with F-values above the level for significance.

The 32 coefficient equation fit to the P- ρ -T data alone provided an acceptable representation of the P- ρ -T surface, but further refinements in the values of coefficients N_1 through N_{32} were subsequently made for improving the calculation of derived properties, particularly of specific heats in the liquid range and at temperatures near the critical value.

Simultaneous Fitting

To incorporate related thermodynamic data with the P- ρ -T data in a single determination of the equation of state, procedures were developed for including values of C_v , and the criteria for phase equilibrium between saturated liquid and saturated vapor points in a simultaneous least squares fitting technique. The procedures for including the conditions of phase equilibrium with the method of least squares are described in [90]. The method used allows integration of functions for property calculation along hypothetical isotherms through the two-phase region. This is accomplished by satisfying thermodynamic relations for two-phase equilibrium of a pure substance. In the least squares formulation incorporating P- ρ -T data, heat capacity data, and these equilibrium conditions, the sums of squares of the weighted residuals of the following functions are minimized simultaneously.

FUNCTIONS FOR SIMULTANEOUS FITTING

$$\begin{aligned}
 P &= \sum N_i P_i(\rho, T) + \rho RT \\
 C_v &= \sum N_i C_i(\rho, T) + C_v^0 \\
 \sum N_i P_i(\rho_{SL}, T_S) - \sum N_i P_i(\rho_{SV}, T_S) &= (\rho_{SV} - \rho_{SL}) RT_S \\
 \sum N_i G_i &= P_S \left(\frac{1}{\rho_{SL} - \rho_{SV}} \right) + RT \ln \left(\frac{\rho_{SL}}{\rho_{SV}} \right)
 \end{aligned}$$

Note: P , ρ , T , and C_v are respectively the pressure, density, temperature, and constant volume heat capacity of data points used in the fit, P_S , T_S , ρ_{SL} , ρ_{SV} , are the saturation pressure, saturation temperature, density of the saturated liquid, and density of the saturated vapor, respectively, the P_i are the individual terms of the equation of state,

the $C_i(\rho, T)$ are given by $C_i(\rho, T) = \int_0^\rho \frac{T}{\rho^2} \left[\frac{\partial^2 P_i(\rho, T)}{\partial T^2} \right] d\rho,$

the G_i are given by $G_i = \int_{\rho_{SL}}^{\rho_{SV}} \left[\frac{P_i(\rho, T_S)}{\rho^2} - \frac{RT_S}{\rho} \right] d\rho,$

and the N_i are the coefficients of the equation of state to be determined.

The equation for C_v for oxygen from Goodwin and Weber [96] was used with the principle of corresponding states for estimating values of C_v for nitrogen using the calculation procedure suggested in [94]. The C_v data were used in simultaneous fitting primarily to give an equation which exhibited proper behavior of the first and second derivatives as evidenced by the behavior of calculated derived properties using these derivatives.

Saturated liquid and saturated vapor densities were required in the formulation of the phase equilibrium criteria. These were calculated from the simultaneous solution of the vapor pressure equation and the interim equation of state both from [104] on intervals of 0.25 degree K between the triple point and the critical point, and two equations of state determined by separate fits to the liquid and vapor regions alone.

The final coefficients for the equation of state were determined by a weighted least squares fit using the criteria outlined above, and constrained to the critical point data given below using a procedure suggested by McCarty [100].

CONSTRAINTS IMPOSED ON THE EQUATION OF STATE

Constraint	Numerical Value
Pressure at the critical point	$P_c = 33.555 \text{ atm}$
Density at the critical point.	$\rho_c = 11.21 \text{ moles/liter}$
Temperature at the critical point	$T_c = 126.20 \text{ K}$
Isotherm derivative at the critical point	$(\partial P / \partial \rho)_T = 0$
Second derivative of pressure with respect to density at the critical point	$(\partial^2 P / \partial^2 \rho)_T = 0$

The coefficients for the constrained equation of state (3) determined as discussed above are presented in Table 3.

$$\begin{aligned}
P = & \rho RT + \rho^2(N_1T + N_2T^{1/2} + N_3 + N_4/T + N_5/T^2) \\
& + \rho^3(N_6T + N_7 + N_8/T + N_9/T^2) \\
& + \rho^4(N_{10}T + N_{11} + N_{12}/T) + \rho^5(N_{13}) \\
& + \rho^6(N_{14}/T + N_{15}/T^2) + \rho^7(N_{16}/T) \\
& + \rho^8(N_{17}/T + N_{18}/T^2) + \rho^9(N_{19}/T^2) \\
& + \rho^3(N_{20}/T^2 + N_{21}/T^3) \exp(-\gamma\rho^2) \\
& + \rho^5(N_{22}/T^2 + N_{23}/T^4) \exp(-\gamma\rho^2) \\
& + \rho^7(N_{24}/T^2 + N_{25}/T^3) \exp(-\gamma\rho^2) \\
& + \rho^9(N_{26}/T^2 + N_{27}/T^4) \exp(-\gamma\rho^2) \\
& + \rho^{11}(N_{28}/T^2 + N_{29}/T^3) \exp(-\gamma\rho^2) \\
& + \rho^{13}(N_{30}/T^2 + N_{31}/T^3 + N_{32}/T^4) \exp(-\gamma\rho^2)
\end{aligned} \tag{3}$$

TABLE 3

COEFFICIENTS FOR THE EQUATION OF STATE (3) FOR NITROGEN*

Coefficient	Numerical Value	Coefficient	Numerical Value
N_1	$0.136224769272827 \times 10^{-2}$	N_{17}	$-0.111614119537424 \times 10^{-5}$
N_2	0.107032469908591	N_{18}	$0.368796562233495 \times 10^{-3}$
N_3	$-0.243900721871413 \times 10^{-1}$	N_{19}	$-0.201317691347729 \times 10^{-5}$
N_4	$0.341007449376470 \times 10^{-2}$	N_{20}	$-0.169717444755949 \times 10^{-5}$
N_5	$-0.422374309466167 \times 10^{-4}$	N_{21}	$-0.119719240044192 \times 10^{-6}$
N_6	$0.105098600246494 \times 10^{-3}$	N_{22}	$-0.975218272038281 \times 10^{-2}$
N_7	$-0.112594826522081 \times 10^{-1}$	N_{23}	$0.554639713151823 \times 10^{-5}$
N_8	$0.142600789270907 \times 10^{-3}$	N_{24}	-0.179920450443470
N_9	$0.184698501609007 \times 10^{-5}$	N_{25}	$-0.256582926077184 \times 10^{-1}$
N_{10}	$0.811140082588776 \times 10^{-7}$	N_{26}	$-0.413707715090789 \times 10^{-3}$
N_{11}	$0.233011645038006 \times 10^{-2}$	N_{27}	-0.256245415300293
N_{12}	-0.507752586350986	N_{28}	$-0.124222373740063 \times 10^{-6}$
N_{13}	$0.485027881931214 \times 10^{-4}$	N_{29}	$0.103556535840165 \times 10^{-4}$
N_{14}	$-0.113656764115364 \times 10^{-2}$	N_{30}	$-0.538699166558303 \times 10^{-9}$
N_{15}	-0.707430273540575	N_{31}	$-0.757415412839596 \times 10^{-8}$
N_{16}	$0.751706648852680 \times 10^{-4}$	N_{32}	$0.585367172069521 \times 10^{-7}$

$$\gamma = 0.0056; \quad R = 0.0820539 \text{ liter-atm/mole-K}$$

*Coefficients are for temperature in degrees Kelvin, pressure in atmospheres, and density in moles/liter.

4. THE VAPOR PRESSURE EQUATION

The literature reporting measurements of the vapor pressure of nitrogen is summarized in Table 2. A preliminary study of the vapor pressure data, and a preliminary vapor pressure equation were reported in [93]. Following the development of the equation for the vapor pressure of oxygen using calorimetric as well as vapor pressure measurements [102], a new vapor pressure equation was developed for nitrogen. This equation is the result of a least squares fit to the nitrogen data of Armstrong [40], and Weber [36]. These data were used since they cover the range from the triple point to the critical point, have a high precision, and appear to be the most accurate measurements available. The form of the vapor pressure equation used in this work is

$$\begin{aligned} \ln(P) = & N_1/T + N_2 + N_3T + N_4(T_C - T)^{1.95} + N_5T^3 + N_6T^4 \\ & + N_7T^5 + N_8T^6 + N_9 \ln(T) \end{aligned} \quad (4)$$

where $T_C = 126.20$ K, the critical point temperature, T is the saturation temperature, and P is the vapor pressure. The coefficients for this equation for temperature in degrees Kelvin and pressure in atmospheres are given in Table 4.

The new vapor pressure measurements by Wagner [49a] were brought to the attention of the authors following the completion of the vapor pressure equation. A comparison of the vapor pressure equation (4) with the selected data sets used in determining the coefficients is given in Figure 2. The data by Wagner [49a] are also compared to equation (4) in Figure 2, and indicate these new data to be concordant with the other vapor pressure data.

The equation has been constrained to the critical point temperature of 126.20 K, the critical pressure of 33.555 atmospheres, and the slope dP/dT of 1.6569 atm/K consistent with the value of $(\partial P/\partial T)_\rho$ at the critical point from the constrained equation of state (3).

TABLE 4
COEFFICIENTS FOR NITROGEN VAPOR PRESSURE EQUATION (4)*

Coefficient	Numerical Value	Coefficient	Numerical Value
N_1	$0.8394409444 \times 10^{-4}$	N_6	$-0.5944544662 \times 10^{-5}$
N_2	$-0.1890045259 \times 10^{-4}$	N_7	$0.2715433932 \times 10^{-7}$
N_3	$-0.7282229165 \times 10^{-1}$	N_8	$-0.4879535904 \times 10^{-10}$
N_4	$0.1022850966 \times 10^{-1}$	N_9	$0.5095360824 \times 10^{-3}$
N_5	$0.5556063825 \times 10^{-3}$		

*Coefficients are for temperature in degrees Kelvin, and pressure in atmospheres.

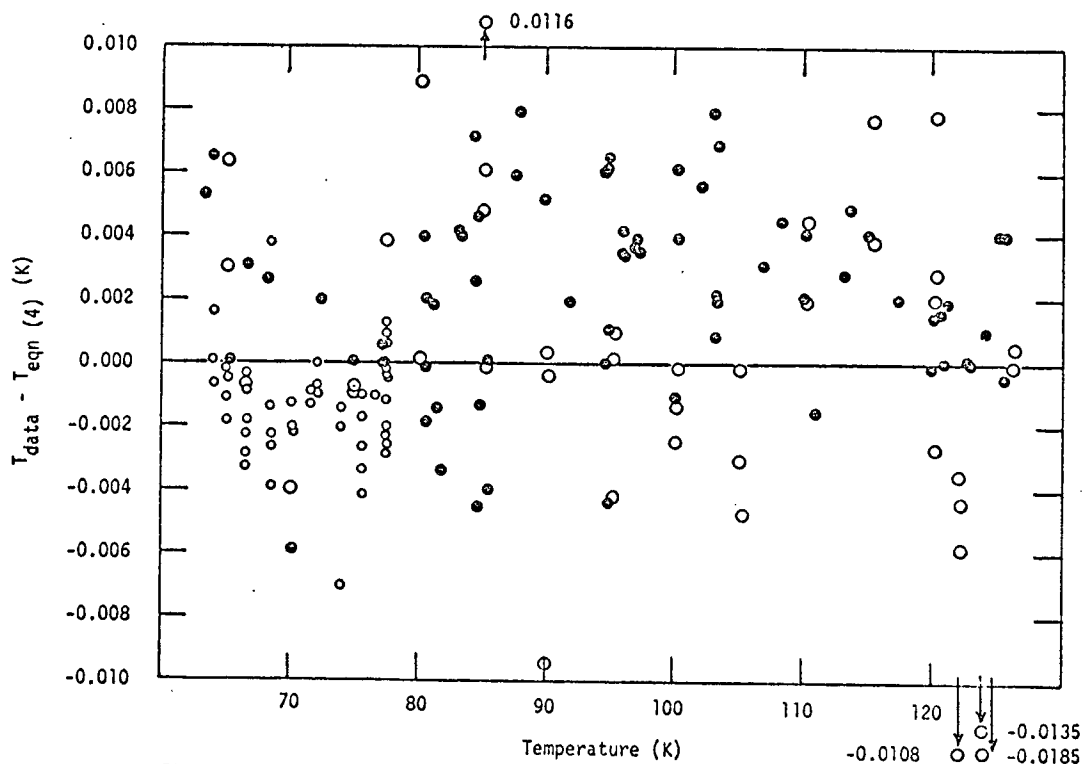


Figure 2. Deviations of Nitrogen Vapor Pressure Equation (4) from Selected Vapor Pressure Data; $\circ$ Armstrong [40]; $\bullet$ Wagner [49a]; $\circ$ Weber [36].

5. COMPARISONS OF P- ρ -T DATA TO THE EQUATION OF STATE

Figures 3, 4, 5, and 6 illustrate the accuracy of the equation of state (3) in representing the P- ρ -T data selected for the determination of the coefficients for the equation of state. The basis for data selection among the values reported by the several experimenters were concordance of data in the same region of the P- ρ -T surface, and the relative agreement with trends established by reliable data defining adjacent regions. The P- ρ -T data sets utilized in the calculation of the coefficients in Table 3 consisted of 1247 weighted data points from [8], [9], [10], [14], [19], [20], [22], [23], [24], [30], [31], [32], and [36]. Comparisons were also made of data not used in determining the equation of state to confirm the data selections which were in part, made from comparisons to an interim equation of state.

Figures 3, 4, 5, and 6 are comparisons of the percent density deviation $[(\rho_{\text{exp}} - \rho_{\text{calc}})/\rho_{\text{exp}}] \times 100$, along approximate isotherms for data used in the determination of the coefficients in Table 3. The quantity ρ_{exp} represents the observed density reported by the experimenter at a particular temperature and pressure, and ρ_{calc} is the density calculated from equation (3) for each experimental temperature and pressure. In addition to the data illustrated in these figures, the density deviations for some data points exceeded the percent density deviation scales used in figures 3, 4, 5, or 6. Table 5 is a listing of these data including the density deviation of each point.

The equation of state generally shows agreement with P- ρ -T data within the experimental uncertainty of the measured values, except in the vicinity of the critical point, in the low temperature liquid region, and in the high pressure supercritical region. The data in these regions are discussed below. Table 6 lists the root mean square deviations in pressure and in density for the various P- ρ -T data sets. The following discussions apply to the data illustrated in Figures 3, 4, 5, and 6, and to that listed in Table 5.

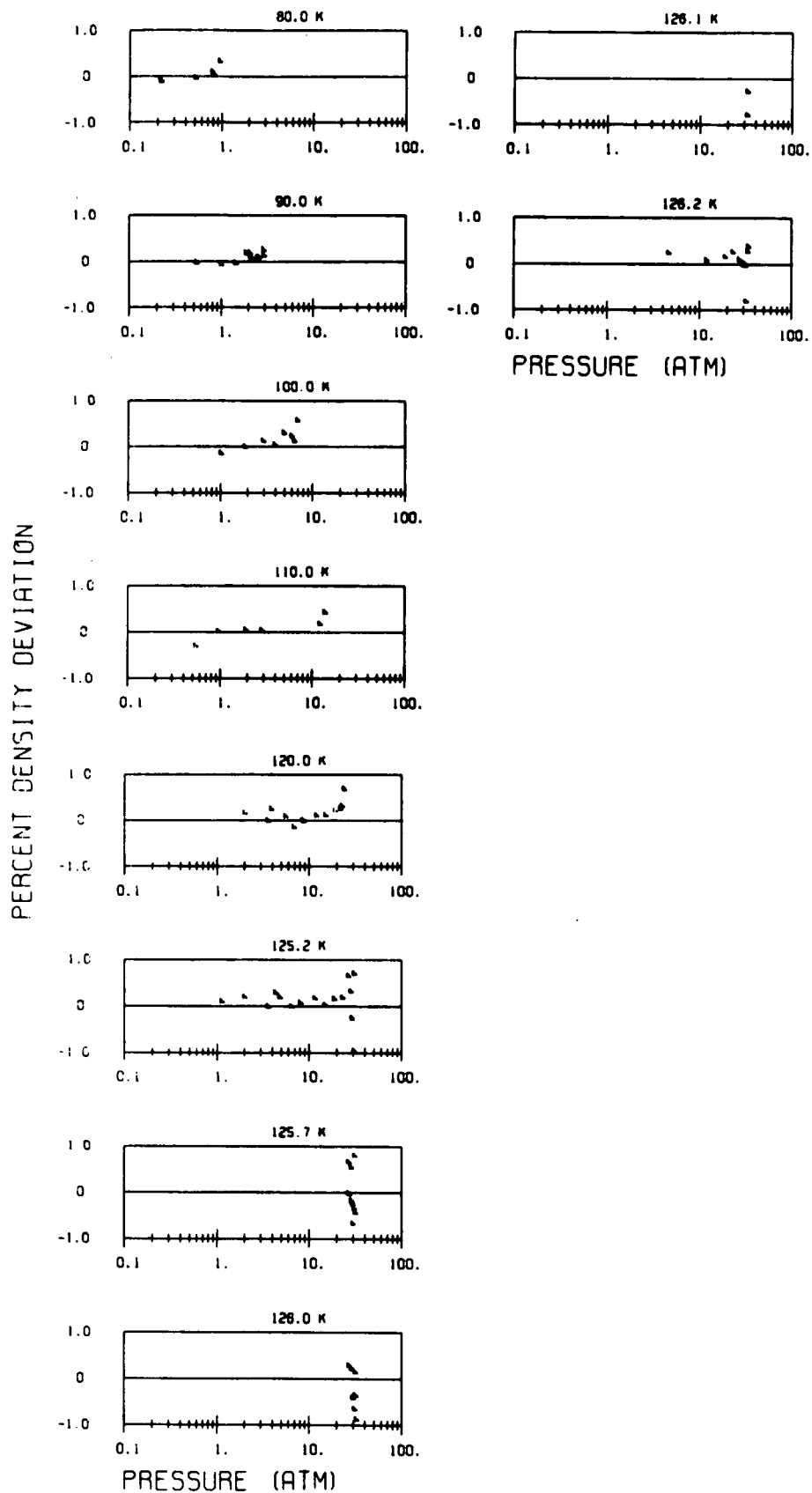


Fig. 3. Deviations in Density of Equation (3) from the P- ρ -T Data for the Low Temperature Vapor from Friedman [10].

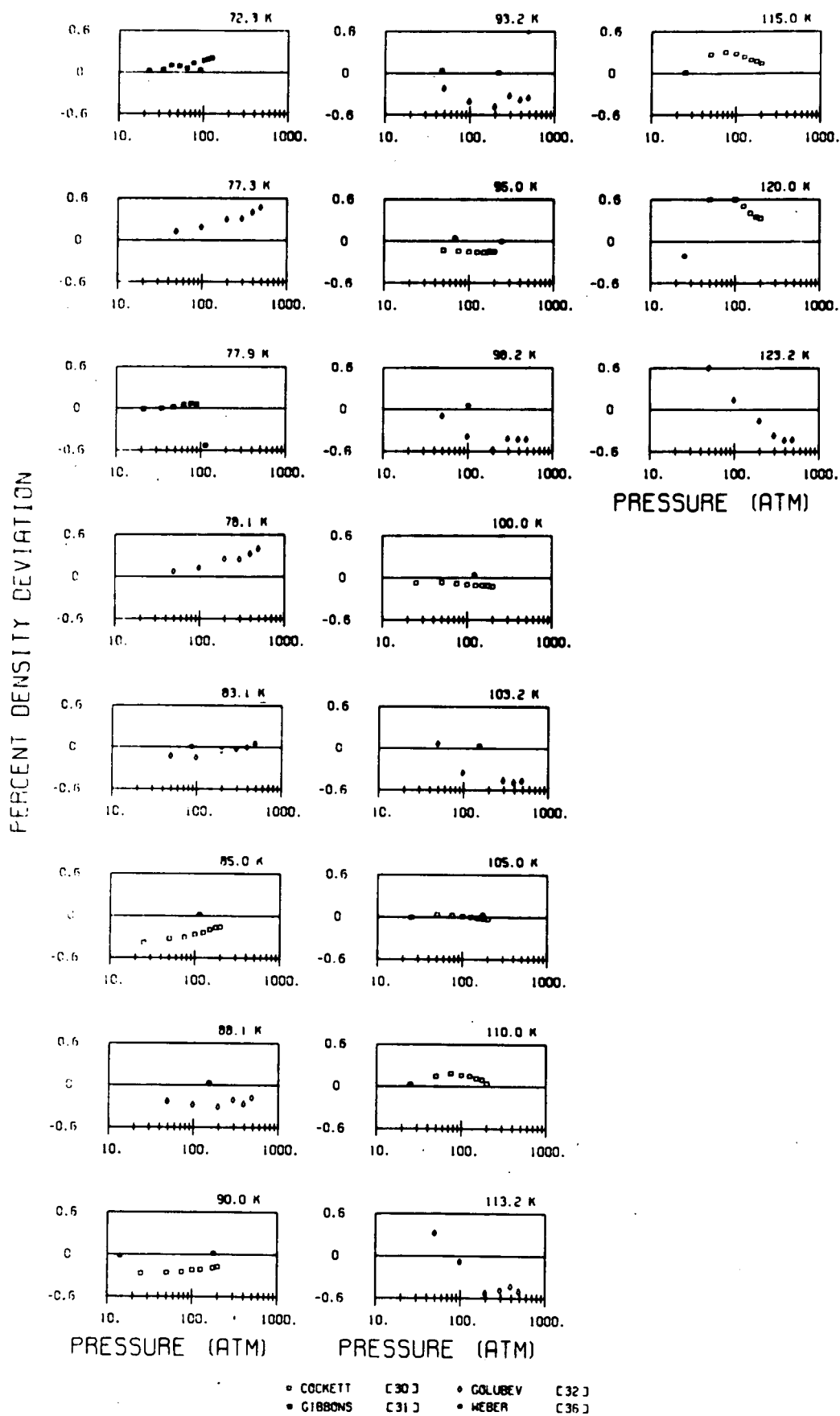


Fig. 4. Deviation in Density of Equation (3) from the P- ρ -T Data of the Liquid from the Reference Cited.

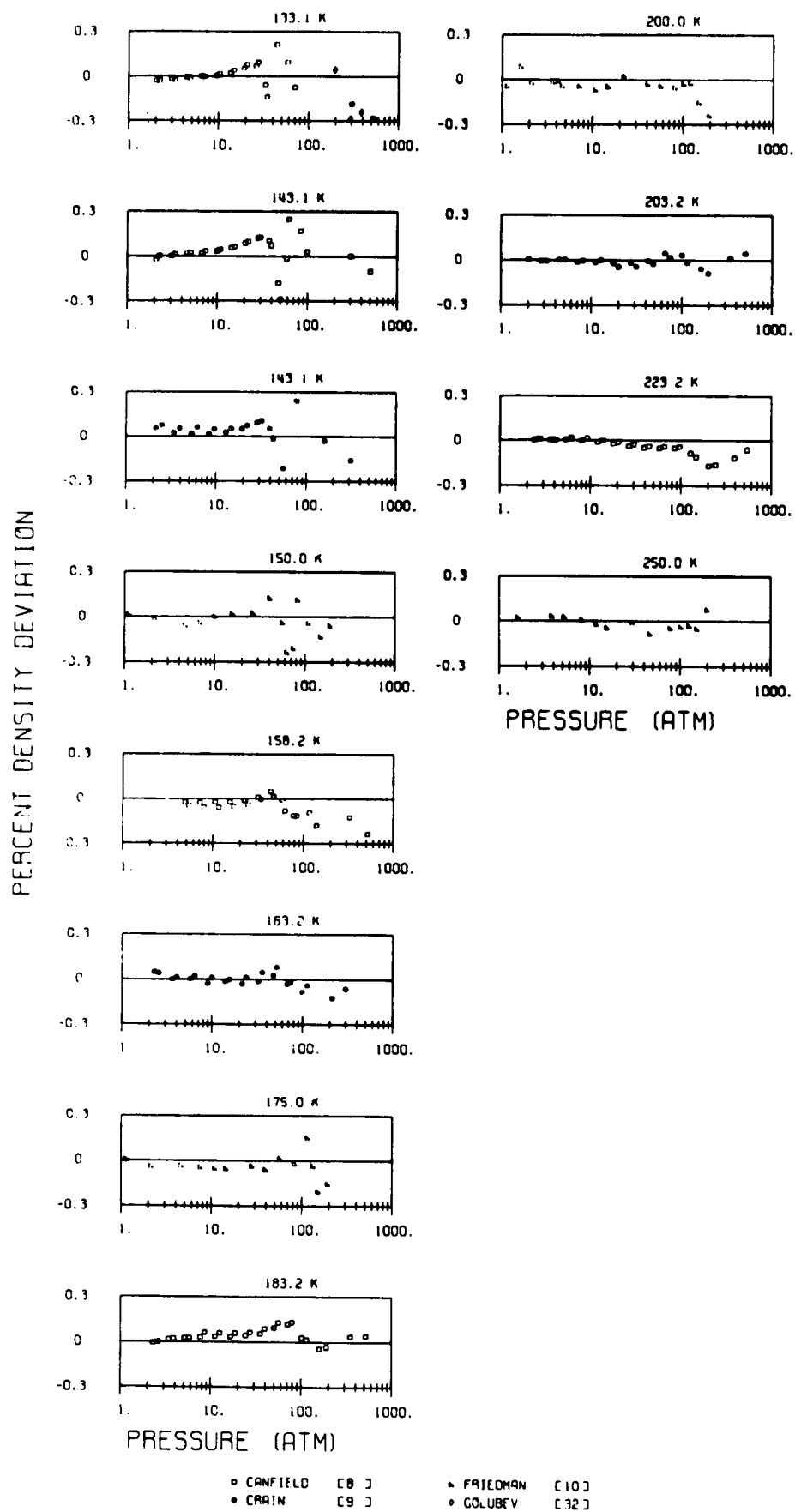


Fig. 5. Deviation in Density of Equation (3) from the P- ρ -T Data at Temperatures Above the Critical Temperature from References Cited.

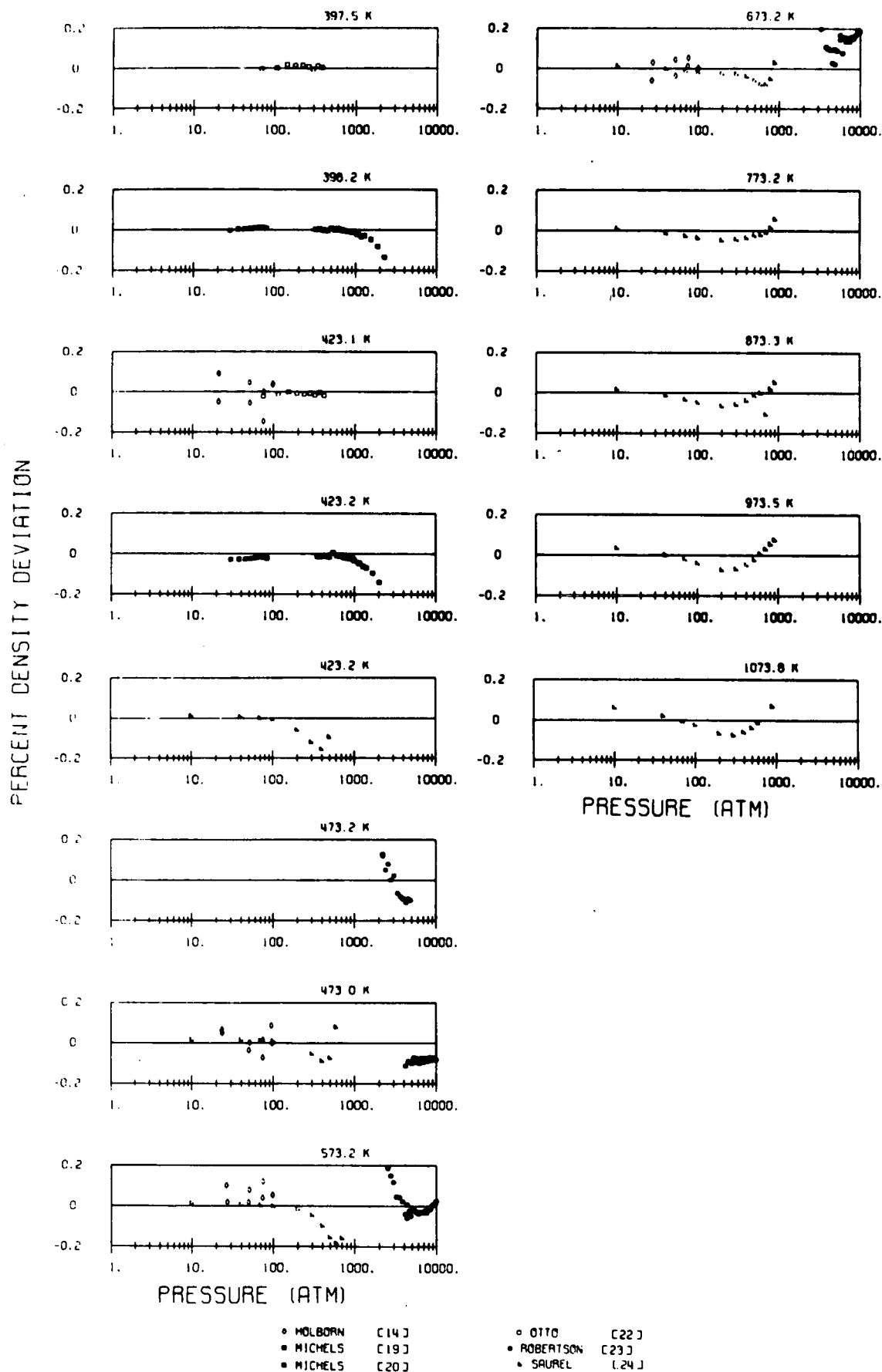


Fig. 5. (continued) Deviation in Density of Equation (3) from the P-p-T Data at Temperatures Above the Critical Temperature from References Cited.

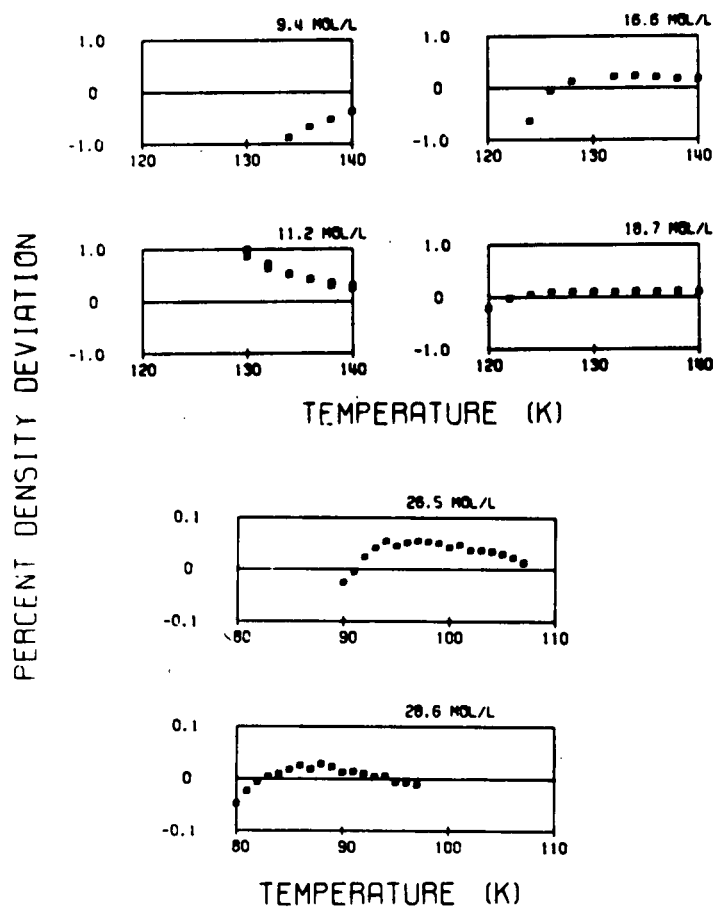


Fig. 6. Deviation in Density of Equation (3) from the P- ρ -T Data of Weber [36] Along Approximate Isochores.

TABLE 5

P- ρ -T DATA WITH DENSITY DEVIATIONS IN EXCESS
OF THE SCALE USED IN FIGURES 3, 4, 5, or 6.

Figure	Temp (K)	Pressure (atm)	Density Deviation (%)	Reference
3	110.02	8.91	- 1.24	[10]
3	120.01	4.84	-51.22	[10]
3	125.21	31.67	- 1.37	[10]
3	125.73	32.12	- 1.99	[10]
3	125.73	32.77	- 5.54	[10]
3	125.73	31.66	- 1.43	[10]
3	125.73	31.21	- 1.93	[10]
3	126.17	33.17	- 1.43	[10]
3	126.17	33.08	- 1.27	[10]
3	126.17	33.46	- 1.09	[10]
3	126.17	33.51	- 1.18	[10]
4	103.16	194.60	- 0.63	[32]
4	119.99	25.00	- 0.61	[30]
4	119.99	75.00	0.69	[30]
5	133.14	45.79	0.97	[8]
5	133.14	40.74	- 1.11	[8]
5	133.14	39.56	- 0.89	[8]
5	133.14	97.80	0.71	[32]
5	133.14	485.00	- 0.33	[32]
5	143.14	66.67	0.41	[9]
5	143.14	51.07	- 0.31	[9]
5	150.63	91.35	- 0.32	[10]
5	273.15	277.19	- 0.21	[8]
5	273.15	415.03	0.29	[8]
5	273.15	230.43	- 0.20	[8]
5	273.15	199.61	- 0.25	[10]
5	299.97	111.78	- 0.34	[10]
5	299.97	200.37	- 0.44	[10]
5	398.15	2766.00	- 0.26	[20]
5	423.17	2437.94	- 0.25	[20]
5	423.17	2960.95	- 0.36	[20]
5	473.19	200.00	- 0.27	[24]
5	673.45	3466.07	- 0.28	[23]
5	673.45	3003.21	0.23	[23]
5	673.45	2797.93	0.29	[23]
5	1073.82	800.00	- 0.28	[24]
5	1073.82	700.00	- 0.21	[24]
6	132.00	41.34	- 1.15	[36]
6	130.00	38.74	- 1.59	[36]
6	128.00	36.03	- 2.39	[36]
6	128.00	36.51	1.15	[36]
6	128.00	36.52	1.24	[36]

TABLE 6

ROOT MEAN SQUARE DEVIATIONS IN DENSITY
AND PRESSURE OF P- ρ -T DATA FROM
THE EQUATION OF STATE

Source	RMS Deviation in Density (percent)	RMS Deviation in Pressure (percent)
Data used in the Determination of the Equation of State		
Canfield [8]	0.166	0.225
Cockett et al. [30]	0.260	7.077
Crain [9]	0.077	0.114
Friedman [10]	0.552	0.166
Golubev and Dobrovolskii [32]	0.352	5.522
Gibbons [31]	0.161	7.901
Holborn and Otto [14]	0.066	0.068
Michels et al. [19]	0.015	0.016
Michels et al. [20]	0.053	0.149
Otto et al. [22]	0.011	0.012
Robertson and Babb [23]	0.077	0.224
Saurel [24]	0.074	0.093
Weber [36]	0.496	0.813
Data not used in the Determination of the Equation of State		
Amagat [1]	0.298	0.499
Amagat [2]	0.136	0.402
Bartlett et al. [4]	0.316	0.478
Bartlett et al. [5]	0.152	0.421
Benedict [6]	1.110	3.505
Benedict [7]	0.279	1.786
Hall and Canfield [11]	0.421	0.361
Heuse and Otto [12]	0.009	0.009
Holborn and Otto [13]	0.082	0.084
Holborn and Otto [15]	0.681	0.551
Malbrunot [18]	1.590	2.327
Malbrunot and Vodar [17]	3.570	4.521
Miller et al. [21]	0.264	0.303
Kamerlingh Onnes and van Urk [16]	6.105	0.333
Streett and Staveley [33]	0.377	26.805
Tsiklis [28]	0.483	1.423
Tsiklis and Polyakov [27]	0.580	2.393
Van Itterbeek and Verbeke [34], [35]	0.372	19.604
Verschoye [29]	0.129	0.139

Data Near the Critical Point

The data of Friedman [10] (Figure 3) for temperatures above 125 K, and Weber [36] (Figure 6), for a density of 11.2 moles/liter illustrate the imprecision of the data in the region of the critical point between temperatures of 120 K and 130 K. This is a difficult region for precise experimental measurements, and a difficult region for fitting the equation of state. Systematic deviations between the equation and the data appear to be present for isotherms above the critical temperature at 133.1 K and 143.1 K in the data of Canfield [8] (Figure 5) and that of Crain [9] at 143.1 K (Figure 5). With the exception of these systematic deviations the equation of state appears to fit the data within the experimental uncertainty of the measurements in this region.

Low Temperature Liquid Data

The data of Cockett et al [30] for the low temperature liquid are shown in Figure 4. The deviations are negative at temperatures below 105 K, and are positive at 110 K and above with the exception of two values at 120 K (Table 5). The deviations for isotherms between 85 K and 115 K are all within ± 0.5 percent.

The liquid data of Golubev and Dobrovolskii [32] are illustrated in Figure 4, and a supercritical isotherm at 133.1 in Figure 5. The data at 77.3 K and 78.1 K in Figure 4 illustrate an apparent systematic trend with deviations up to 0.5 percent at pressures above 400 atmospheres. Systematic deviations are also evident in Figure 4 for temperatures between 98.2 K and 133.1 K, where at pressures below 100 atmospheres the deviations reach about + 0.7 percent, and at pressures in excess of 400 atmospheres the differences are as large as - 0.5 percent.

The data of Gibbons [31] are illustrated in Figure 4. These data appear consistent with the equation of state for the two isotherms at 72.3 K and 77.9 K.

The density deviations of the equation of state from the data of Weber [36] are illustrated on several isotherms in Figure 4 to facilitate comparison to other liquid data. All of Weber's data are compared with equation (3) in Figure 6 for approximate isochoric values between 9 and 28 moles/liter. (At 9.47 moles/liter the state is vapor, while all other

isochores are for liquid values.) These data exhibit general agreement with the equation of state, although the isochoric plots indicate a systematic deviation with a maximum discrepancy of -2.4 percent for the 9.47 moles/liter vapor isochore and systematic trends are evident for the 11.2 and 16.0 moles/liter isochores. The data of [36] appear to be more precise than the other liquid data available for nitrogen.

High Pressure Data

The equation of state fits the data of Saurel [24] (shown in Figure 5 for several isotherms from 423.2 K to 1073.6 K), and that of Robertson and Babb [23] (illustrated in Figure 5 for several isotherms from 308.1 K to 673.1 K) which were judged to be most accurate and thus used to define this region. The data of [17], [18], [27], and [28] exhibit large systematic deviations from the equation of state, and are not in accord among the several experimenters.

6. EXTRAPOLATION OF THE EQUATION OF STATE

The P- ρ -T data for the saturated liquid and the freezing line were excluded in the determination of the coefficients of the equation of state (3). Extrapolations of the equation of state to the saturated liquid line have been made and are compared with the experimental data available for these conditions in Figure 7. The P- ρ -T values calculated for these comparisons were determined using the vapor pressure equation (4) to calculate the pressure corresponding to the data temperature.

Extrapolation of the equation of state to the melting curve was made with pressures on the melting curve determined from the Simon melting curve equation (5) as reported by Grilly and Mills [39] with appropriate temperature corrections.

$$P = a + bT^c \quad (5)$$

where $a = 1579.08$, $b = 0.926302$, and $c = 1.795$, with pressures in atmospheres and temperatures in degrees K. Densities at the melting curve calculated from the equation of state are compared with the measured values of Grilly and Mills [39] in Figure 8.

In addition to the extrapolation of the equation of state in the liquid range it is also desirable to extrapolate the vapor data to higher and lower temperatures. At both high and low temperatures, the dominant terms in the equation of state are $\rho RT + \rho^2(N_1T + N_2T^{1/2} + N_3 + N_4/T + N_5/T^2)$. With equation (3) expanded as a power series (i.e., a virial equation), the second virial coefficient becomes,

$$B(T) = (N_1T + N_2T^{1/2} + N_3 + N_4/T + N_5/T^2)RT, \quad (6)$$

where the N_i are the coefficients from Table 3, and T is the temperature in degrees K. Hence, the dominant terms are the contributions from first and second virial terms.

The contribution for the ideal gas and second virial terms taken from equation (3) is as follows:

$$\text{Percent } P = (P/P_{\text{eqn}}) \times 100 \quad (7)$$

where P is the contribution to the calculated pressure attributed to the sum of the ideal gas and second virial term [$P = \rho RT + B(T)\rho^2/RT$] and P_{eqn} is the pressure calculated from equation (3) at the specified temperature T , and density ρ . Figures 9 and 10 illustrate Percent P as the contribution of these terms. Figure 11 is a similar comparison showing the percentage contribution of the ideal gas term alone for the low temperature vapor. The contribution here is determined from equation (7) with $P = RT$.

Examination of Figures 9, 10, and 11 indicates that the extrapolation of the equation of state for the vapor at high and low temperatures is reasonable, and for higher temperatures is limited by the accuracy of the second virial coefficient as predicted by equation (6). Figure 12 is a comparison of values from equation (6) with the experimental virial coefficients from the references cited. The accuracy of the second virial coefficient from equation (3), as illustrated in Figure 12, indicates that the extrapolation of the equation of state from 1000 K to 2000 K for pressures to 300 atmospheres is reasonable. Figure 11 indicates that equation (3) may also be extrapolated to lower temperatures for the gas to the saturated vapor line.

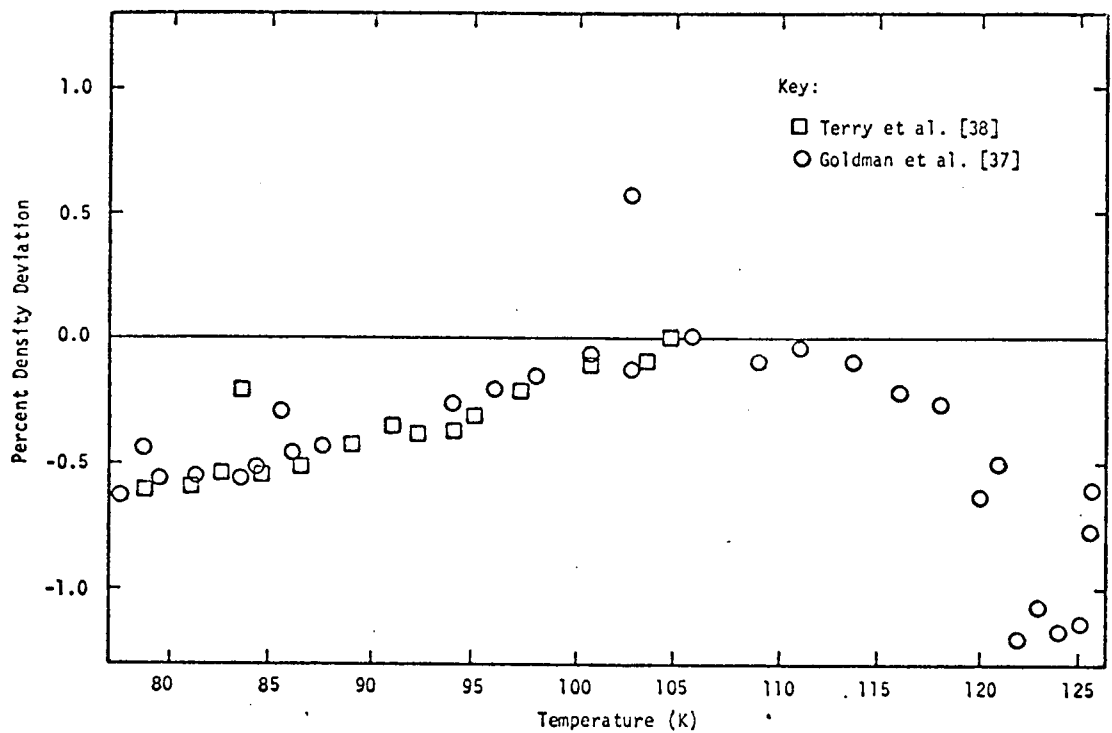


Figure 7. -- Deviations of equation (3) from Liquid P-o-T Data at the Vapor Pressure.

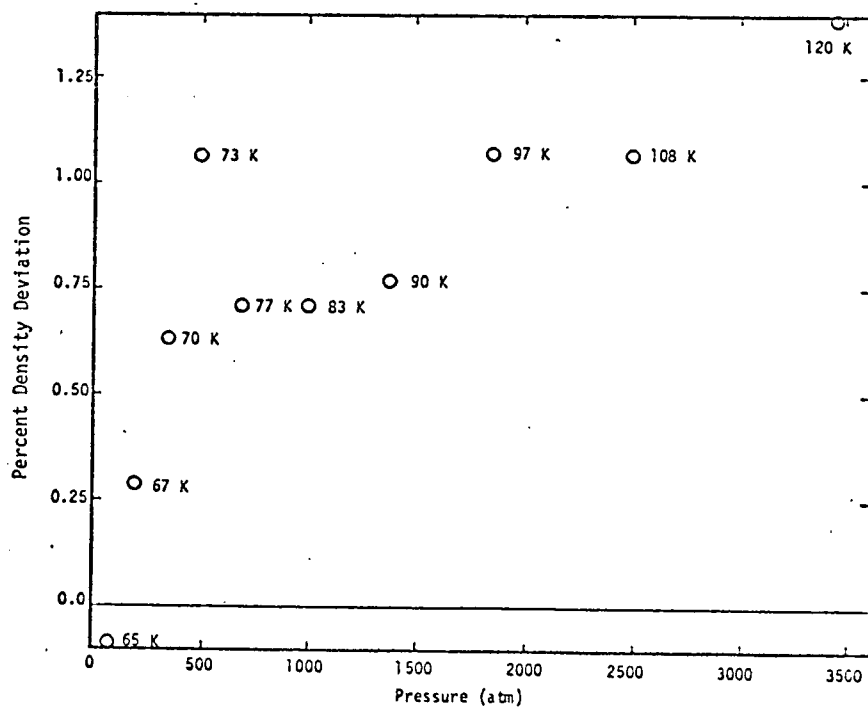


Figure 8.---Deviations of Equation (3) from Liquid P-o-T Data on the Freezing Line from [39]. (Nominal temperatures are given beside each point).

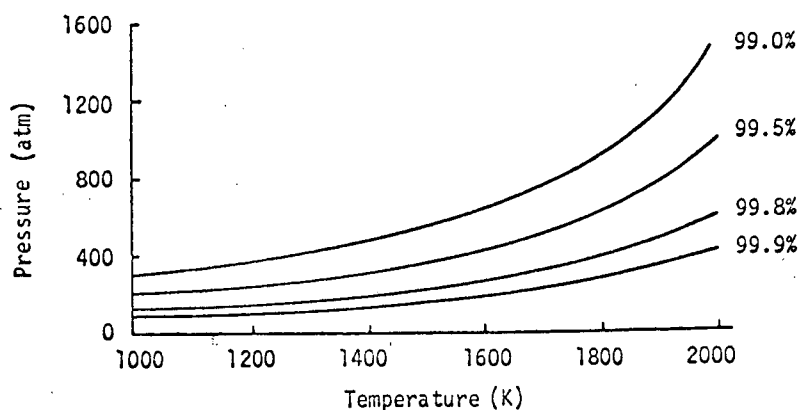


Figure 9.--Percentage Contribution of First and Second Virial Terms to Pressure from Equation (3) at High Temperature.

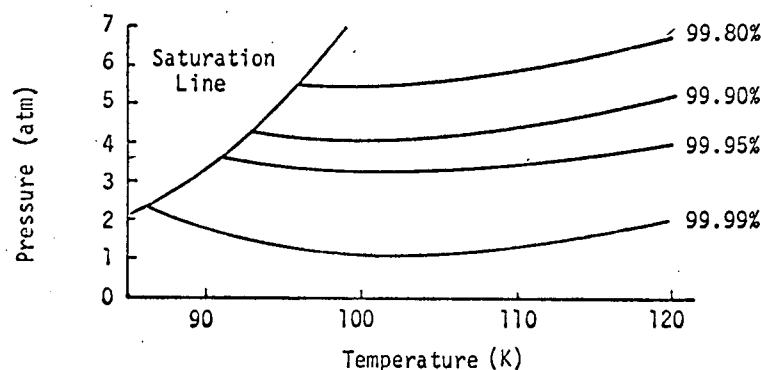


Figure 10.--Percentage Contribution of First and Second Virial Terms to Pressure from Equation (3) at Low Temperature

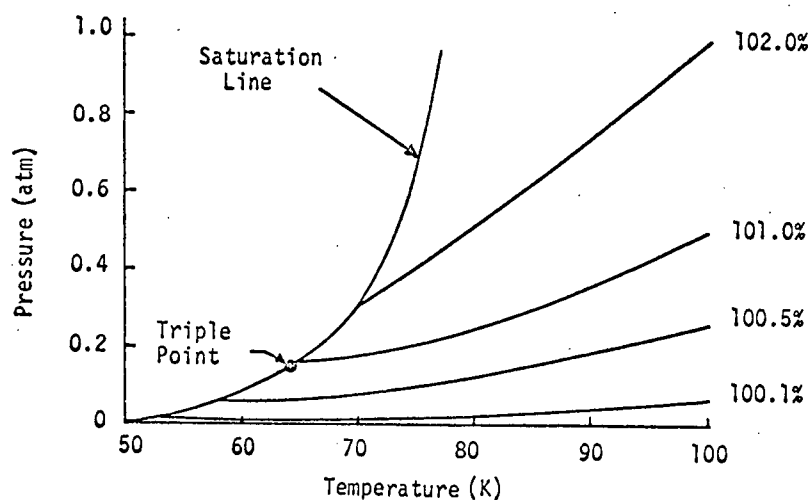


Figure 11.--Percentage Contribution of First Virial (ideal gas) Term to Pressure from Equation (3) at Low Temperature.

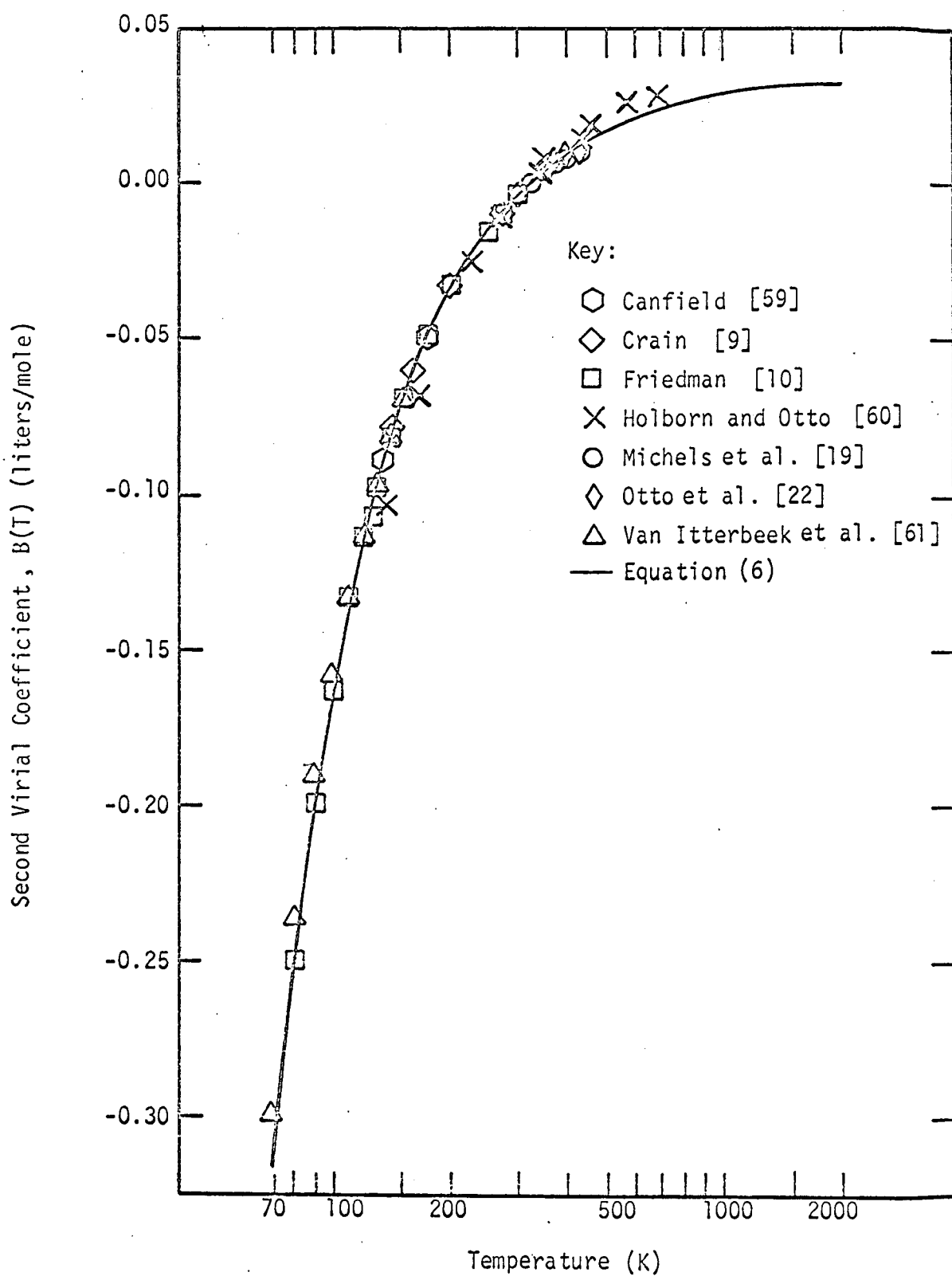


Figure 12.--Comparison of Second Virial Coefficient from Equation (6) to Experimental Values from References Cited.

7. THE IDEAL GAS HEAT CAPACITY

The values for ideal gas heat capacity used in the calculation of the thermodynamic property tables are from [84] and [85]. These values appear to be the most accurate to date.

The equation suggested by Barieau [86], and Barieau and Tully [87], has been fitted to the data from [84]. This equation is

$$C_p^0/R = N_1/T^3 + N_2/T^2 + N_3/T + N_4 + N_5T + N_6T^2 + N_7T^3 + N_8u^2e^u/(e^u - 1)^2 \quad (8)$$

where C_p^0 is the ideal gas heat capacity, T the temperature, and $u = N_9/T$. The coefficients for equation (8) with values of T in degrees Kelvin are given in Table 7.

TABLE 7
COEFFICIENTS FOR THE IDEAL GAS HEAT CAPACITY EQUATION (8)
FOR NITROGEN

Coefficients	Numerical Value	Coefficients	Numerical Value
N_1	$-0.7352104012 \times 10^{-3}$	N_6	$0.1746508498 \times 10^{-7}$
N_2	$0.3422399804 \times 10^{-2}$	N_7	$-0.3568920335 \times 10^{-11}$
N_3	-0.5576482846	N_8	$0.1005387228 \times 10^{-1}$
N_4	$0.3504042283 \times 10^{-1}$	N_9	3353.4061
N_5	$-0.1733901851 \times 10^{-4}$		

Table 8 is a listing of the ideal gas heat capacity values (C_p^0/R) as a function of temperature as reported in [84]. A comparison between these

values from [84] and values calculated from equation (8) indicates exact agreement within the number of figures reported, except above 1200 K. Above 1200 K the differences between the values from equation (8) and from [84] is no more than $\pm .0001$.

TABLE 8

VALUES OF IDEAL GAS HEAT CAPACITY, C_p^0/R ,
FROM BAEHR, ET AL. [84]

Temperature (K)	C_p^0/R	Temperature (K)	C_p^0/R
50.0	3.4999	450.0	3.5308
60.0	3.4998	460.0	3.5349
70.0	3.4998	470.0	3.5392
80.0	3.4997	480.0	3.5438
90.0	3.4997	490.0	3.5487
100.0	3.4996	500.0	3.5538
110.0	3.4996	510.0	3.5591
120.0	3.4995	520.0	3.5647
130.0	3.4995	530.0	3.5705
140.0	3.4994	540.0	3.5765
150.0	3.4994	550.0	3.5828
160.0	3.4994	560.0	3.5892
170.0	3.4993	570.0	3.5958
180.0	3.4993	580.0	3.6026
190.0	3.4992	590.0	3.6095
200.0	3.4992	600.0	3.6166
210.0	3.4992	610.0	3.6239
220.0	3.4992	620.0	3.6312
230.0	3.4992	630.0	3.6387
240.0	3.4992	640.0	3.6463
250.0	3.4993	650.0	3.6539
260.0	3.4994	660.0	3.6617
270.0	3.4995	670.0	3.6695
280.0	3.4998	680.0	3.6774
290.0	3.5001	690.0	3.6854
300.0	3.5006	700.0	3.6934
310.0	3.5011	710.0	3.7014
320.0	3.5018	720.0	3.7095
330.0	3.5027	730.0	3.7176
340.0	3.5038	740.0	3.7257
350.0	3.5050	750.0	3.7338
360.0	3.5065	760.0	3.7419
370.0	3.5081	770.0	3.7500
380.0	3.5101	780.0	3.7581
390.0	3.5122	790.0	3.7662
400.0	3.5147	800.0	3.7742
410.0	3.5174	810.0	3.7822
420.0	3.5203	820.0	3.7902
430.0	3.5235	830.0	3.7982
440.0	3.5270	840.0	3.8061

TABLE 8 --continued

Temperature (K)	C_p^0/R	Temperature (K)	C_p^0/R
850.0	3.8139	1250.0	4.0724
860.0	3.8217	1300.0	4.0966
870.0	3.8295	1350.0	4.1192
880.0	3.8372	1400.0	4.1404
890.0	3.8448	1450.0	4.1601
900.0	3.8524	1500.0	4.1786
910.0	3.8599	1550.0	4.1959
920.0	3.8674	1600.0	4.2120
930.0	3.8748	1650.0	4.2271
940.0	3.8821	1700.0	4.2413
950.0	3.8894	1750.0	4.2546
960.0	3.8966	1800.0	4.2671
970.0	3.9037	1850.0	4.2789
980.0	3.9107	1900.0	4.2899
990.0	3.9177	1950.0	4.3003
1000.0	3.9246	2000.0	4.3101
1050.0	3.9579		
1100.0	3.9893		
1150.0	4.0188		
1200.0	4.0465		

8. DERIVED THERMODYNAMIC PROPERTIES

The values of entropy, enthalpy, internal energy, the isotherm derivative, the isochore derivative, C_v , C_p , and the velocity of sound at various state points are calculated from the equation of state (3), and the ideal gas heat capacity equation (8). The vapor pressure equation (4) and the Simon melting curve equation (5) were used to identify the temperature of the phase changes from vapor to liquid, and solid to vapor, respectively, for each isobar. The integral representations for the properties are continuously integrated through the two-phase region to calculate properties in the liquid range. This is made possible by the fitting procedures employed in the development of the equation of state as described in Section 3 in which the conditions for two-phase equilibrium were included in the least squares determination of the coefficients for the equation of state (3). The thermodynamic formulations for the calculation of the thermodynamic property tables were taken from [93]. These relations are summarized in the following paragraphs. Functions for the integrals and derivatives of the equation of state required to perform these calculations are given in Appendix A.

The entropy of any thermodynamic state was calculated from

$$S(T, \rho) = S_{T_0}^0 + \int_{T_0}^T (C_p^0/T) dT - R \ln(RT\rho) + \int_0^\rho [R/\rho - (1/\rho^2)(\partial P/\partial T)_\rho]_T d\rho \quad (9)$$

The ideal gas specific heat, C_p^0 , is from equation (8). The reference entropy of the ideal gas at $T_0 = 298.15$ K and $P_0 = 1$ atmosphere, $S_{T_0}^0 = 191.502 \pm 0.025$ joules/mol-K is taken from [92].

The enthalpy of any state may be calculated from

$$H(T, \rho) = H_{T_0}^0 + T \int_0^\rho \left[(P/T\rho^2) - (1/\rho^2)(\partial P/\partial T)_\rho \right]_T d\rho \\ + (P - \rho RT)/\rho + \int_{T_0}^T C_p^0 dT. \quad (10)$$

However, it is convenient to replace the first integral term in (10) as follows:

$$T \int_0^\rho \left[(P/T\rho^2) - (1/\rho^2)(\partial P/\partial T)_\rho \right]_T d\rho \\ \equiv T \int_0^\rho \left[(R/\rho) - (1/\rho^2)(\partial P/\partial T)_\rho \right] d\rho \\ + \int_0^\rho \left[(P/\rho^2) - (RT/\rho) \right]_T d\rho \quad (11)$$

By substitution of the identity of (11) in equation (10), the expression for enthalpy is given as

$$H(T, \rho) = H_{T_0}^0 + T \int_0^\rho \left[(R/\rho) - (1/\rho^2)(\partial P/\partial T)_\rho \right]_T d\rho \\ + \int_0^\rho \left[(P/\rho^2) - (RT/\rho) \right]_T d\rho + (P - \rho RT)/\rho \\ + \int_{T_0}^T C_p^0 dT. \quad (12)$$

The reference enthalpy of the ideal gas at $T_0 = 298.15$ K of $H_{T_0}^0 = 8669 \pm 3$ joules/mole was taken from the value of $(H^0 - H_0^0)$ in [92] with $H_0^0 = 0.0$. The internal energy of a fluid state was calculated from

$$U(T, \rho) = H(T, \rho) - P/\rho. \quad (13)$$

The specific heat at constant volume, C_v , of liquid and gas phase points was calculated using the relation

$$C_v(T, \rho) = (C_p^0 - R) - \int_0^{\rho} (T/\rho^2) [(\partial^2 P / \partial T^2)_\rho]_T d\rho \quad (14)$$

where C_p^0 at temperature, T , is calculated from equation (8). The specific heat at constant pressure, C_p , is given by

$$C_p(T, \rho) = C_v(T, \rho) + [(T/\rho^2)(\partial P / \partial T)_\rho^2 / (\partial P / \partial \rho)_T] \quad (15)$$

It is notable that the calculation of properties from the equation developed in this work is considerably simplified from the prior methods of [93] by the continuous integration along isotherms through the two phase region due to the imposing of the requirements for phase equilibrium in the determination of the equation of state as suggested in [90]. Difference between values of the thermodynamic properties for the liquid for values calculated by continuous integration along isotherms through the vapor-liquid phase change, and calculated by use of the Clapeyron equation for the phase change are given in Table 9. The differences in liquid properties indicated in Table 9 are generally within the uncertainty of the property values.

A sample table of thermodynamic properties of nitrogen illustrating the results of the property calculations outlined above is included in this report. A table of properties of the saturated liquid and vapor states is also included.

TABLE 9

COMPARISON BETWEEN LIQUID THERMODYNAMIC PROPERTY VALUES
 CALCULATED BY CONTINUOUS INTEGRATION ALONG ISOTHERMS
 AND THE CLAPEYRON EQUATION FOR THE VAPOR-LIQUID PHASE CHANGE
 (Subscript c refers to Clapeyron Calculation, b to Continuous Integration)

Temp (K)	$H_c - H_b$ (J/mol)	$S_c - S_b$ (J/mol-K)	$C_{V_c} - C_{V_b}$ (J/mol-K)	$W_c - W_b$ (m/sec)
65	+ 1	.08	-4.45	52
70	-12	-.08	- .71	5
75	-13	-.11	- .29	2
80	-15	-.14	- .66	5
85	-19	-.18	- .59	4
90	-21	-.20	- .05	0
100	-18	-.16	+ .39	-2
110	-16	-.15	+ .55	-3
120	+14	+.11	+4.94	-26
126.20	0	0	0	0

9. COMPARISONS OF THE EQUATION OF STATE WITH RELATED THERMODYNAMIC DATA

Experimental measurements of properties of nitrogen in addition to the P- ρ -T data are available for comparison to values calculated using the equation of state developed in this work. Comparisons between measured and calculated values of the heat capacities, latent heats of vaporization, enthalpies, and sonic velocities are reported here. The thermodynamic property formulations used in the calculation of various properties from the equation of state are presented in the preceding section.

Calculated Heat Capacity Values

Values of C_p and C_v for nitrogen calculated by integration along isotherms using equation (3) with coefficients from Table 3 are illustrated in Figures 13 and 14 for isobars of 1, 10, 50, 100, and 400 atmospheres. The behavior of the calculated values of C_v below 75 K as indicated in Figure 14 is questionable.

Comparisons of the Specific Heat Data

Comparisons of isobaric heat capacity values, C_p , calculated from the equation of state (3) and the ideal gas heat capacity equation (8) to measured values from [54] and [55] are given in Table 10. The data reported by [53] also includes the values from [51] and [55]. The isobaric heat capacities, C_p , listed in Table 10 from [54] and [55] agree with the values calculated from the equation of state generally within 0.6 percent, except for five values of Mage et al [55] in the region of the critical point where the calculated C_p values reflects the imprecision of the experimental data and the fitting problems in the critical region.

Comparisons of isochoric heat capacity values, C_v , calculated from the equation of state (3) and the ideal gas heat capacity equation (8) to measured values along the critical isochore published by Vornel et al [56] are also given in Table 10. (The value of the critical density determined in this work is 11.21 moles/liter while that of [56] is 11.1 moles/liter.) The

calculated values of C_v do not exhibit the large increase in value near the critical point that is evident in the data of [56], and no attempt was made to introduce this behavior into the equation of state. Although experiments have shown that C_v does behave in the manner indicated by [56], the few measurements of the properties of nitrogen near the critical point now available are insufficient to provide for the correct characteristics of second derivatives of an equation of state determined by a least squares fit.

Much of the data reported in [56] are for temperatures below 126.20 K (i.e., for the two phase fluid). These two-phase data points are not included in the comparison in Table 10.

Comparisons of Latent Heat Data

Furukawa and McCoskey [52] have published measured latent heats of vaporization at low temperatures (67 K - 78 K), and Jones [53] has presented five measurements of the latent heat of vaporization for the range from 119 K to 124 K. The comparisons of calculated values from equations (3), (4), and (8) to these measured values are given in Table 11.

Comparison of Experimental Enthalpy Values

Wiener [57] has reported measurements of the enthalpy of nitrogen made prior to measuring hydrocarbon enthalpy values. A comparison of the measured enthalpy values by Wiener to values calculated from the equation of state (3) is presented in Table 12. The values of [57] have been adjusted to the ideal gas reference enthalpy of 8669 joules/mole at 298.15 K from the published datum of 0.0 Btu/lb_m at 75 F and 14.7 psia. Wiener has estimated the accuracy of the measured values of [57] as ± 130 joules/mole. The calculated values of enthalpy at the experimental temperature and pressure are well within this uncertainty with the exception of two points which are indicated in [57] to be in doubt.

Comparisons of the Entropy of the Saturated Liquid

The vapor pressure equation (4) was tested using calculations employing the saturated liquid heat capacity data of Clusius [50] and Weibe and Brevoort [58]. The results are summarized in Table 13 which compares values of saturated liquid entropy S_c'' and S_σ'' . S_c'' was calculated using the

datum value for entropy of the ideal gas at 298.15 K, the equation of state, (3), the ideal gas heat capacity equation (8), and the vapor pressure equation (4) for values of the slope (dP/dT) as required by the Clapeyron equation. S_{σ}'' was determined by the calculation of differences in the saturated liquid entropy along the saturated liquid line, from an equation for saturated liquid heat capacity data determined by a least squares fit to the data reported in [50] and [58]. The datum state in the calculation of S_{σ}'' was the value of the saturated liquid entropy S_c'' at 100 K.

Comparison of Selected Velocity of Sound Data

The velocity of sound data from references [62] through [83] have been reviewed, and the data from [73], [74], [75], and [83] have been selected for comparison in Table 14 with sonic velocities calculated from the equation of state. The values given in Table 14 include data for the liquid, the vapor to high pressures, and values for the saturated liquid and the saturated vapor. A large proportion of the data not included in these comparisons is for pressures of 1 atmosphere or less.

The calculated values of the velocity of sound for the vapor phase including the saturated vapor and the high pressure region above the critical temperature are generally within 1 percent of the measured values. However, deviations for the calculated sonic velocities in the low temperature liquid region are as large as 12 percent, while the saturated liquid values indicate differences of nearly 30 percent at pressures below 0.5 atmosphere and near the critical point.

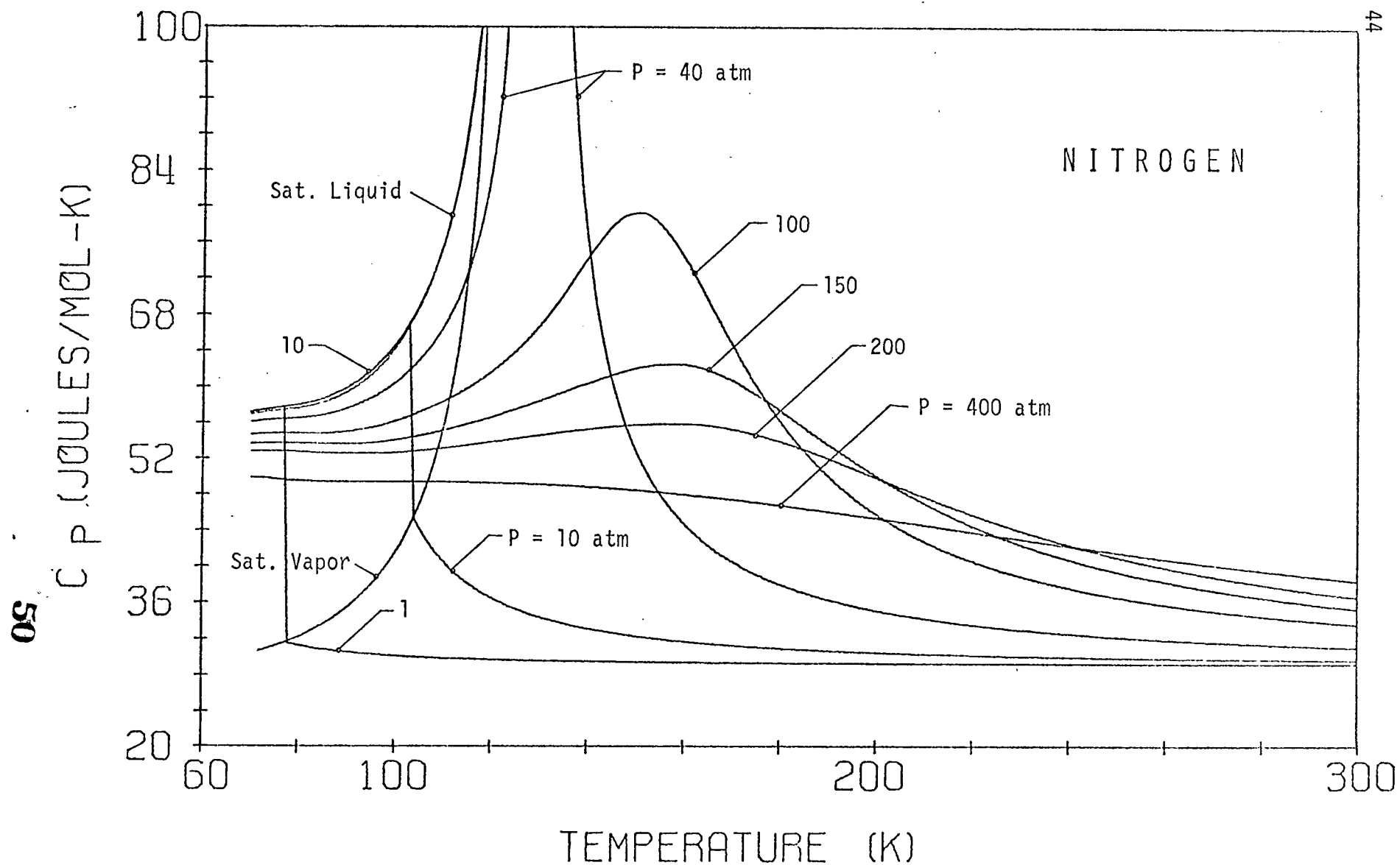


Figure 13. Constant Pressure Heat Capacity (C_p) of Nitrogen Calculated from Equation of State (3) with Coefficients of Table 3.

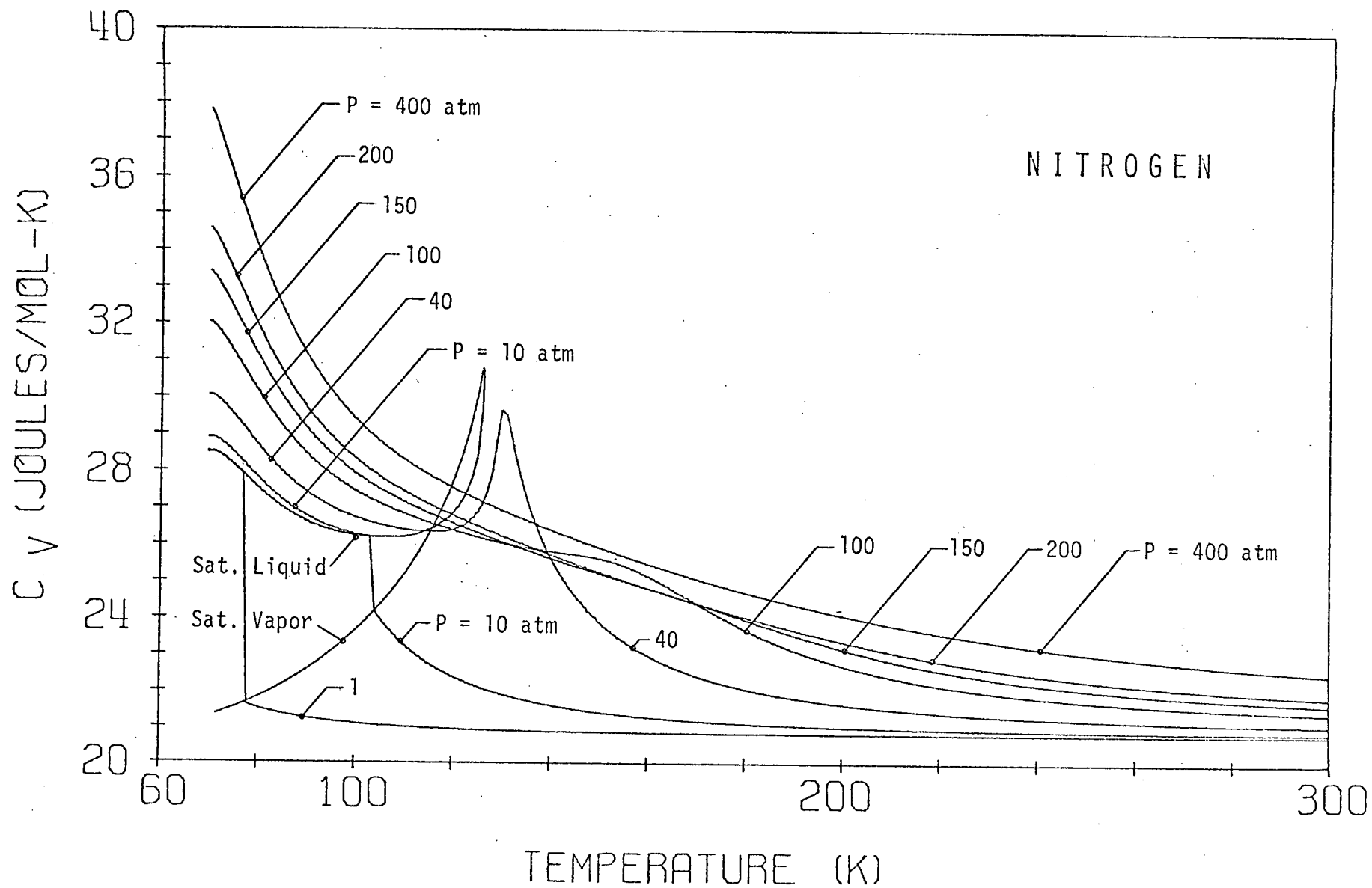


Figure 14. Constant Volume Heat Capacity (C_v) of Nitrogen Calculated from Equation of State (3) with Coefficients of Table 3.

TABLE 10

COMPARISONS OF HEAT CAPACITY MEASUREMENTS WITH VALUES CALCULATED FROM THE EQUATION OF STATE (3)
AND THE IDEAL GAS HEAT CAPACITY EQUATION (8)

C_p data of Krase and Mackey [54]				C_p data of Mage et al [55]				C_v data of Voronel [56]		
Temp (K)	Press (atm)	C_p [54] (J/mol-K)	ΔC_p^* (J/mol-K)	Temp Range (K)	Press (atm)	C_p [55] (J/mol-K)	ΔC_p^{**} (J/mol-K)	Temp (K)	C_v [56] (J/mol-K)	$C_{v,calc}$ (J/mol-K)
303.1	1	28.94	-0.22	268.3 - 279.6	10.0	29.58	-0.09	126.21	95.7	30.7
303.1	50	31.03	-0.31	222.7 - 233.9	10.0	29.87	-0.13	126.22	94.8	30.7
303.1	100	33.17	-0.20	194.3 - 205.0	10.0	30.23	-0.17	126.23	85.6	30.7
303.1	200	36.18	-0.10	166.6 - 177.7	10.0	31.02	-0.06	126.23	87.9	30.7
303.1	300	37.44	-0.22	267.7 - 279.0	20.0	30.19	-0.07	126.23	79.5	30.7
303.1	400	37.98	-0.13	222.7 - 233.9	20.0	30.85	-0.11	126.25	79.7	30.7
303.1	500	38.19	0.02	194.3 - 205.3	20.0	31.62	-0.20	126.25	84.2	30.7
303.1	600	38.27	0.17	166.6 - 177.6	20.0	33.53	0.05	126.26	76.6	30.7
303.1	700	38.36	0.35	116.5 - 119.2	27.2	94.76	2.48	126.27	77.8	30.7
323.1	1	28.98	-0.18	122.5 - 124.7	33.6	166.32	25.25	126.29	75.7	30.7
323.1	100	32.33	-0.40	122.5 - 125.6	33.6	265.07	99.49	126.29	71.0	30.7
323.1	200	34.84	-0.41	122.5 - 125.7	33.6	496.48	323.99	126.33	65.3	30.7
323.1	300	36.43	-0.16	122.5 - 128.0	33.6	409.22	-1.38	126.34	67.9	30.7
323.1	400	36.89	-0.26	122.5 - 153.0	33.6	128.31	-0.35	126.34	65.6	30.7
323.1	500	37.06	-0.28	267.8 - 279.0	40.0	31.35	-0.09	126.38	65.0	30.7
323.1	600	37.10	-0.27	222.7 - 234.0	40.0	32.86	-0.19	126.38	61.5	30.7
323.1	700	37.19	-0.15	194.3 - 205.3	40.0	34.98	-0.08	126.45	58.8	30.6
323.1	800	37.23	-0.05	166.6 - 177.7	40.0	39.85	-0.04	126.40	58.8	30.7
373.2	1	29.06	-0.14	119.3 - 125.1	40.0	96.50	0.81	126.47	56.6	30.6
373.2	50	30.19	-0.32	267.8 - 279.2	80.0	33.67	-0.04	126.57	54.7	30.6
373.2	100	31.32	-0.38	222.8 - 234.1	80.0	37.19	0.07	126.73	50.5	30.6
373.2	200	33.17	-0.38	194.3 - 205.3	80.0	42.32	-0.15	126.87	49.2	30.5
373.2	300	34.46	-0.23	166.6 - 177.7	80.0	57.19	-0.72	126.97	47.1	30.5
373.2	400	34.97	-0.38	119.3 - 125.0	80.0	66.63	-0.23	127.06	45.8	30.5
373.2	500	35.13	-0.56	267.8 - 279.0	136.1	36.48	0.06	127.35	43.8	30.4
373.2	600	35.30	-0.57	222.9 - 234.2	136.1	41.78	-0.06	127.91	40.4	30.2
373.2	700	35.39	-0.57	194.3 - 205.4	136.1	49.36	-0.16	128.75	37.6	30.0
398.2	1	29.10	-0.14	166.6 - 177.6	136.1	61.38	-0.13	129.79	35.7	29.8
398.2	50	30.15	-0.22	146.0 - 148.0	136.1	64.90	0.35	130.87	34.0	29.5
398.2	100	30.99	-0.40	146.0 - 150.3	136.1	65.17	0.40	131.97	32.8	29.2
398.2	200	32.50	-0.49	146.0 - 154.6	136.1	65.58	0.49	133.10	31.8	29.0
398.2	300	33.54	-0.50	146.0 - 156.4	136.1	65.51	0.41	135.36	29.9	28.5
398.2	400	34.21	-0.47	126.9 - 129.1	136.1	59.82	0.27	136.34	30.0	28.3
398.2	500	34.59	-0.47	126.9 - 131.3	136.1	60.23	0.41	142.18	28.1	27.3
398.2	600	34.76	-0.52	126.9 - 135.4	136.1	60.85	0.51	143.05	27.8	27.1
398.2	700	34.97	-0.44	119.3 - 125.1	136.1	58.01	-0.20	155.66	26.4	25.6
423.2	1	29.15	-0.15					156.72	26.1	25.5
423.2	50	30.11	-0.16					167.04	26.1	24.6
423.2	100	30.82	-0.34							
423.2	200	32.08	-0.49							
423.2	300	33.04	-0.48							
423.2	400	33.58	-0.56							
423.2	500	34.04	-0.50							
423.2	600	34.34	-0.45							
423.2	700	34.55	-0.39							

$$^*\Delta C_p = C_p[54] - C_{p,calc}$$

$$^{**}\Delta C_p = C_p[55] - C_{p,calc}$$

TABLE 11

COMPARISON OF LATENT HEATS OF EVAPORATION FROM
[52] AND [53] WITH VALUES CALCULATED
FROM EQUATIONS (3), (4), and (8).

Comparison to Data of Furukawa and McCoskey [52]			
Temperature (K)	Pressure (atm)	Latent Heat [52] (joules/mole)	$\frac{L[52] - L_{calc}}{L[52]} \times 100$ (percent)
67.96	0.28	5901.6	0.29
67.96	0.28	5899.0	0.24
73.09	0.59	5739.1	0.40
73.09	0.59	5732.1	0.28
78.02	1.08	5579.4	0.70
78.01	1.08	5563.1	0.41
Comparison to Data of Jones [53]			
Temperature (K)	Pressure (atm)	Latent Heat [53] (joules/mole)	$\frac{L[53] - L_{calc}}{L[53]} \times 100$ (percent)
119.20	23.80	2702.3	-1.10
119.16	23.80	2678.2	-2.04
119.19	27.18	2220.4	-2.33
121.89	30.61	1681.3	0.56
124.29	23.80	2714.7	-0.82

TABLE 12

COMPARISON OF ENTHALPY DATA BY WEINER [57] WITH VALUES
CALCULATED FROM THE EQUATION OF STATE (3) AND THE
IDEAL GAS HEAT CAPACITY EQUATION (8)

Temperature (K)	Pressure (atm)	H[57] (joules/mole)	H[57] - H _{calc} (joules/mole)
138.71	67.37	621	-248
142.59	52.06	1988	-107
142.04	29.26	3551	323
145.93	28.58	3421	- 10
143.15	21.78	3551	8
142.04	17.69	3616	- 16
158.71	28.92	3877	- 69
159.26	28.58	4072	96
199.82	51.72	5049	- 22
202.04	28.99	5505	33
207.59	65.32	5179	- 1
310.93	34.02	8826	- 24
322.59	27.90	9151	- 85
359.26	40.83	10258	- 33
421.48	47.63	12146	- 10
422.04	40.83	12146	- 41
449.26	47.63	12993	- 3

TABLE 13

COMPARISON OF SATURATED LIQUID ENTROPY CALCULATED FROM
(1) EQUATION OF STATE AND IDEAL GAS HEAT CAPACITY
EQUATION, AND (2) SATURATED LIQUID HEAT
CAPACITY DATA OF CLUSIUS [50] AND
WIEBE AND BREVOORT [58]

Temperature (K)	Pressure (atm)	(1) S_c'' (joules/mole-K)	(2) S_σ'' (joules/mole-K)
70	0.38	73.80	73.68
71	0.44	74.61	74.49
72	0.51	75.41	75.28
73	0.58	76.20	76.07
74	0.66	76.98	76.85
75	0.75	77.75	77.62
76	0.85	78.51	78.38
77	0.96	79.27	79.13
78	1.08	80.01	79.87
79	1.21	80.74	80.61
80	1.35	81.47	81.34
81	1.51	82.19	82.06
82	1.67	82.90	82.77
83	1.86	83.60	83.48
84	2.05	84.30	84.18
85	2.26	84.99	84.87
86	2.49	85.67	85.56
87	2.73	86.34	86.24
88	2.99	87.01	86.92
89	3.27	87.68	87.59
90	3.56	88.34	88.26
91	3.88	88.99	88.92
92	4.21	89.64	89.58
93	4.51	90.29	90.24
94	4.94	90.93	90.89
95	5.34	91.57	91.53
96	5.76	92.21	92.18
97	6.21	92.84	92.82
98	6.68	93.47	93.46
99	7.17	94.10	94.09
100	7.69	94.73	94.73
101	8.24	95.35	95.36
102	8.81	95.98	95.99
103	9.41	96.60	96.62
104	10.04	97.23	97.25
105	10.70	97.85	97.88
106	11.39	98.48	98.51
107	12.11	99.10	99.14
108	12.87	99.73	99.77
109	13.66	100.36	100.40
110	14.48	101.00	101.03
111	15.34	101.63	101.67
112	16.23	102.28	102.31
113	17.16	102.93	102.95
114	18.13	103.58	103.60
115	19.14	104.25	104.25

NOTE:

T - Temperature of comparison.

P - Vapor pressure from vapor pressure equation at temperature T.

S_c'' - Entropy of saturated liquid from equation of state, vapor pressure equation, and ideal gas heat capacity equation using Clapeyron equation with the derivative of the vapor pressure equation.

S_σ'' - Entropy of saturated liquid from a fit to saturated liquid heat capacity data

$$S_\sigma'' = S_0 + \int_{T_0}^T (C_\sigma/T) dT$$

where $T_0 = 100$ K and $S_0 = S''$ at 100 K.

TABLE 14

COMPARISONS OF SELECTED MEASURED VALUES OF VELOCITY OF SOUND FOR NITROGEN TO CALCULATED VALUES

Pressure (atm)	Temperature (K)	Experimental Velocity of Sound (meters/sec)	$\frac{W_{data} - W_{calc}}{W_{data}} \times 100$ (percent)	Pressure (atm)	Temperature (K)	Experimental Velocity of Sound (meters/sec)	$\frac{W_{data} - W_{calc}}{W_{data}} \times 100$ (percent)
Low Temperature Liquid Data of [73]							
84.3	113.6	589	0.22	0.68	74.2	881	-13.17
68.3	109.2	617	2.02	0.85	76.0	864	-11.44
104.7	113.4	634	2.15	1.26	79.3	831	- 8.99
104.7	113.6	631	1.95	1.29	79.6	829	- 8.77
42.2	104.8	614	0.66	1.39	80.3	822	- 8.31
43.6	105.0	616	1.00	1.81	82.7	796	- 6.95
57.1	105.9	629	1.25	1.89	83.2	791	- 6.70
94.8	110.2	646	1.81	2.25	84.9	772	- 5.85
126.8	113.8	659	1.82	2.66	86.7	755	- 4.93
104.7	109.5	666	1.84	2.70	86.9	753	- 4.79
8.5	90.6	725	- 2.38	2.82	87.4	748	- 4.54
8.5	90.6	726	- 2.24	3.05	88.2	739	- 4.26
46.9	85.5	819	- 2.89	3.96	91.3	705	- 3.27
86.0	87.6	836	- 1.17	4.61	93.1	685	- 2.72
136.9	91.0	850	0.16	6.39	97.4	636	- 1.74
38.4	84.3	822	- 3.72	7.38	99.4	612	- 1.47
84.3	87.7	834	- 1.12	8.34	101.2	590	- 1.36
134.3	90.6	853	0.30	9.86	103.7	559	- 1.22
8.2	81.0	826	- 6.76	13.4	108.7	493	- 1.50
1.6	77.6	851	- 9.89	14.7	110.2	472	- 1.73
8.1	75.3	883	-10.87	17.1	112.9	434	- 2.32
52.0	77.5	897	- 6.64	19.1	115.0	403	- 3.05
116.6	81.0	917	- 2.39	21.4	117.1	369	- 4.22
61.5	77.6	902	- 6.30	23.9	119.3	329	- 6.31
121.9	80.9	920	- 2.47	24.1	119.4	327	- 6.12
1.7	73.6	896	-12.82	25.0	120.2	313	- 6.92
112.6	75.0	959	- 5.97	26.4	121.2	290	- 9.09
111.5	75.0	959	- 5.93	28.0	122.4	265	-10.49
120.0	73.8	975	- 6.35	30.6	124.3	220	-14.77
Saturated Liquid Data of [74]				30.7	124.3	219	-14.79
0.18	65.4	968	-27.17	31.9	125.1	191	-20.16
0.22	66.4	959	-24.61	32.4	125.5	183	-19.51
0.29	68.1	942	-21.37	Saturated Vapor Data of [75]			
0.38	70.0	924	-18.21	1.24	79.2	177	0.46
0.50	71.9	905	-15.64	1.13	78.4	177	0.78
				1.07	78.0	176	0.39
				0.50	71.9	171	0.45

TABLE 14-- continued

Pressure (atm)	Temperature (K)	Experimental Velocity of Sound (meters/sec)	$\frac{W_{data} - W_{calc}}{W_{data}} \times 100$ (percent)	Pressure (atm)	Temperature (K)	Experimental Velocity of Sound (meters/sec)	$\frac{W_{data} - W_{calc}}{W_{data}} \times 100$ (percent)
High Pressure Data of [83]				600	423.17	658	0.86
600	298.14	655	- 0.90	1000	423.17	810	0.43
1000	298.14	844	- 0.36	1500	423.17	972	0.41
1500	298.14	1030	0.35	2200	423.17	1107	- 4.12
2000	298.14	1170	- 0.03	2500	423.17	1223	0.15
2500	298.14	1296	0.39	3000	423.17	1330	0.39
3000	298.14	1398	0.23	3500	423.17	1420	0.16
3250	298.14	1445	0.23	4000	423.17	1480	- 1.47
3500	298.14	1500	0.94	200	448.18	500	0.92
3750	298.14	1545	1.11	600	448.18	660	0.68
200	323.14	440	0.37	1000	448.18	810	0.69
600	323.14	650	- 0.59	1500	448.18	960	- 0.25
1000	323.14	830	- 0.38	2200	448.18	1098	- 4.23
1500	323.14	1010	0.08	2500	448.18	1216	0.29
2000	323.14	1160	0.69	3000	448.18	1325	0.72
2500	323.14	1280	0.59	3500	448.18	1410	0.13
3000	323.14	1380	0.23	4000	448.18	1435	- 4.00
3500	323.14	1480	0.75				
600	348.14	655	0.73				
1000	348.14	825	0.26				
1500	348.14	1000	0.46				
2000	348.14	1140	0.30				
2500	348.14	1262	0.42				
3000	348.14	1370	0.64				
3500	348.14	1463	0.63				
200	373.15	462	0.02				
600	373.15	648	- 0.19				
1000	373.15	820	0.57				
1500	373.15	985	0.08				
2200	373.15	1130	- 3.90				
2500	373.15	1248	0.40				
3000	373.15	1354	0.48				
3500	373.15	1442	0.12				
200	398.16	476	0.55				
600	398.16	654	0.60				
1000	398.16	818	0.98				
1500	398.16	978	0.29				
2200	398.16	1115	- 4.20				
2500	398.16	1232	0.05				
3000	398.16	1338	0.19				
200	423.17	486	0.30				

10. CONCLUSIONS AND RECOMMENDATIONS

The results of this study are summarized below:

1. The equation of state (3) developed in this work represents the experimental P - ρ - T data in the liquid and vapor phases for pressures from 0 to 10,000 atmospheres and for temperatures of 65 to 1073 K. The equation may be extrapolated to 2000 K at pressures below 300 atmospheres with an accuracy of at least ± 1 percent. The equation may also be extrapolated to lower temperatures for the vapor with an accuracy of at least ± 0.2 percent down to 20 K at very low pressures. It is estimated that the accuracy of the equation of state is within 0.5 percent in the liquid region, except in the vicinity of the critical point. The uncertainty of the equation of state for the liquid for pressures above 500 atm (and to the melting line) must be regarded as ± 2 percent until further measurements are available to confirm this extrapolation. At temperatures above the critical temperature for pressures up to 1000 atmospheres, the accuracy is generally within 0.1 percent except in the region near the critical point between temperatures of 126.2 K and 150 K and at pressures between 30 and 150 atmospheres where the density deviations from experimental data are as large as 0.7 percent. In the range from 1000 to 10,000 atmospheres the accuracy is estimated to be within 0.3 percent.
2. The vapor pressure equation (4) represents the selected data used in the formulation of the equation generally within an accuracy of ± 0.01 K between the triple point and the critical point.
3. The equation for the ideal gas specific heat (8) has been used to represent the recent values of C_p^0/R from [55] with an accuracy of $\pm .00005$ for values to 1200 K, and within ± 0.0001 above 1200 K.
4. Values of the heat capacity, enthalpy, and latent heats of vaporization are presented with comparisons to available measured calorimetric data. Although the paucity of these measurements make it difficult to define the accuracy of the equation of state (3) for the calculation of heat

capacity values, these comparisons further indicate that the behavior of the isobaric calculated values is thermodynamically correct.

5. The least squares techniques used in the formulation presented here include the simultaneous fitting of P - ρ - T data, C_v data, and the criteria for phase equilibrium to allow for continuous integration along isotherms through the two-phase region. It is recommended that the derived properties, for the liquid phase, be calculated by this method in preference to the use of Clapeyron equation for the difference in entropy or enthalpy for the phase change.

Suggestions for further research are presented below:

1. The work reported here is essentially complete within the limits imposed by the availability of experimental data to describe the thermodynamic properties of nitrogen. However, the lack of agreement of the various P - ρ - T data in the liquid region suggests the need for further measurement of the properties of the liquid.
2. The use of a single equation of state for the P - ρ - T surface appears to be accompanied by fitting problems near the critical point which propagate to temperatures above the critical value. It is suggested that new methods of accommodating the requirements of the P - ρ - T surface in this region for the least squares determination of the equation of state be explored.
3. The consistency of the vapor pressure equation, melting equation, and equation of state in the region of the triple point should be investigated.
4. A detailed study of the sonic velocity data should be made to complete the analysis of this data and to identify the cause of the large deviations of calculated velocity of sound values from experimental measurements in the liquid region.
5. Comparison of the oxygen and nitrogen equations of state by the Principle of Corresponding States should be made with the objective of confirming the selection of the liquid P - ρ - T data.

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APPENDIX A

FUNCTIONS FOR THE CALCULATION OF THERMODYNAMIC
PROPERTIES FROM THE EQUATION OF STATE (3)The Equation of State

Equation (3) may be written in the form:

$$P = \rho RT + \sum_{i=1}^{32} N_i X_i$$

where the N_i are listed in Table 3 and the X_i are as follows:

$X_1 = \rho^2 T$	$X_{12} = \rho^4 / T$	$X_{23} = \rho^5 F / T^4$
$X_2 = \rho^2 T^{1/2}$	$X_{13} = \rho^5$	$X_{24} = \rho^7 F / T^2$
$X_3 = \rho^2$	$X_{14} = \rho^6 / T$	$X_{25} = \rho^7 F / T^3$
$X_4 = \rho^2 / T$	$X_{15} = \rho^6 / T^2$	$X_{26} = \rho^9 F / T^2$
$X_5 = \rho^2 / T^2$	$X_{16} = \rho^7 / T$	$X_{27} = \rho^9 F / T^4$
$X_6 = \rho^3 T$	$X_{17} = \rho^8 / T$	$X_{28} = \rho^{11} F / T^2$
$X_7 = \rho^3$	$X_{18} = \rho^8 / T^2$	$X_{29} = \rho^{11} F / T^3$
$X_8 = \rho^3 / T$	$X_{19} = \rho^9 / T^2$	$X_{30} = \rho^{13} F / T^2$
$X_9 = \rho^3 / T^2$	$X_{20} = \rho^3 F / T^2$	$X_{31} = \rho^{13} F / T^3$
$X_{10} = \rho^4 T$	$X_{21} = \rho^3 F / T^3$	$X_{32} = \rho^{13} F / T^4$
$X_{11} = \rho^4$	$X_{22} = \rho^5 F / T^2$	

$$F = \exp(-0.0056 \rho^2)$$

The Isotherm Derivative

The isotherm derivative of the equation of state (3) may be represented as:

$$(\partial P / \partial \rho)_T = RT + \sum_{i=1}^{32} N_i X_i$$

where the N_i are given in Table 3 and the X_i are as follows:

$X_1 = 2\rho T$	$X_{12} = 4\rho^3 / T$	$X_{23} = F_{22} / T^4$
$X_2 = 2\rho T^{1/2}$	$X_{13} = 5\rho^4$	$X_{24} = F_{23} / T^2$
$X_3 = 2\rho$	$X_{14} = 6\rho^5 / T$	$X_{25} = F_{23} / T^3$
$X_4 = 2\rho / T$	$X_{15} = 6\rho^5 / T^2$	$X_{26} = F_{24} / T^2$
$X_5 = 2\rho / T^2$	$X_{16} = 7\rho^6 / T$	$X_{27} = F_{24} / T^4$
$X_6 = 3\rho^2 T$	$X_{17} = 8\rho^7 / T$	$X_{28} = F_{25} / T^2$
$X_7 = 3\rho^2$	$X_{18} = 8\rho^7 / T^2$	$X_{29} = F_{25} / T^3$
$X_8 = 3\rho^2 / T$	$X_{19} = 9\rho^8 / T^2$	$X_{30} = F_{26} / T^2$
$X_9 = 3\rho^2 / T^2$	$X_{20} = F_{21} / T^2$	$X_{31} = F_{26} / T^3$
$X_{10} = 4\rho^3 T$	$X_{21} = F_{21} / T^3$	$X_{32} = F_{26} / T^4$
$X_{11} = 4\rho^3$	$X_{22} = F_{22} / T^2$	

$$F = \exp(-0.0056 \rho^2)$$

$$F_1 = 2F\rho(-0.0056)$$

$$F_{21} = 3F\rho^2 + F_1\rho^3$$

$$F_{22} = 5F\rho^4 + F_1\rho^5$$

$$F_{23} = 7F\rho^6 + F_1\rho^7$$

$$F_{24} = 9F\rho^8 + F_1\rho^9$$

$$F_{25} = 11F\rho^{10} + F_1\rho^{11}$$

$$F_{26} = 13F\rho^{12} + F_1\rho^{13}$$

The Isochore Derivative

The isochore derivative of the equation of state (3) may be written as:

$$(\partial P / \partial T)_\rho = \rho R + \sum_{i=1}^{32} N_i X_i$$

where the N_i are given in Table 3 and the X_i are as follows:

$X_1 = \rho^2$	$X_{12} = -\rho^4/T^2$	$X_{23} = -4\rho^5 F/T^5$
$X_2 = \rho^2/(2T^{1/2})$	$X_{13} = 0.0$	$X_{24} = -2\rho^7 F/T^3$
$X_3 = 0.0$	$X_{14} = -\rho^6/T^2$	$X_{25} = -3\rho^7 F/T^4$
$X_4 = -\rho^2/T^2$	$X_{15} = -2\rho^6/T^3$	$X_{26} = -2\rho^9 F/T^3$
$X_5 = -2\rho^2/T^3$	$X_{16} = -\rho^7/T^2$	$X_{27} = -4\rho^9 F/T^5$
$X_6 = \rho^3$	$X_{17} = -\rho^8/T^2$	$X_{28} = -2\rho^{11} F/T^3$
$X_7 = 0.0$	$X_{18} = -2\rho^8/T^3$	$X_{29} = -3\rho^{11} F/T^4$
$X_8 = -\rho^3/T^2$	$X_{19} = -2\rho^9/T^3$	$X_{30} = -2\rho^{13} F/T^3$
$X_9 = -2\rho^3/T^3$	$X_{20} = -2\rho^3 F/T^3$	$X_{31} = -3\rho^{13} F/T^4$
$X_{10} = \rho^4$	$X_{21} = -3\rho^3 F/T^4$	$X_{32} = -4\rho^{13} F/T^5$
$X_{11} = 0.0$	$X_{22} = -2\rho^5 F/T^3$	

$$F = \exp(-0.0056 \rho^2)$$

The Evaluation of Integrals

The integral, $\int [R/\rho - (1/\rho^2)(\partial P / \partial T)_\rho]_T d\rho$ may be written as:

$$\sum_{i=1}^{32} N_i Y_i$$

where the N_i are listed in Table 3 and the Y_i are listed below:

$Y_1 = -\rho$	$Y_{12} = \rho^3/(3T^2)$	$Y_{23} = 4G_2/T^5$
$Y_2 = -\rho/(2T^{1/2})$	$Y_{13} = 0.0$	$Y_{24} = 2G_3/T^3$
$Y_3 = 0.0$	$Y_{14} = \rho^5/(5T^2)$	$Y_{25} = 3G_3/T^4$
$Y_4 = \rho/T^2$	$Y_{15} = 2\rho^5/(5T^3)$	$Y_{26} = 2G_4/T^3$
$Y_5 = 2\rho/T^3$	$Y_{16} = \rho^6/(6T^2)$	$Y_{27} = 4G_4/T^5$
$Y_6 = -\rho^2/2$	$Y_{17} = \rho^7/(7T^2)$	$Y_{28} = 2G_5/T^3$
$Y_7 = 0.0$	$Y_{18} = 2\rho^7/(7T^3)$	$Y_{29} = 3G_5/T^4$
$Y_8 = \rho^2/(2T^2)$	$Y_{19} = \rho^8/(4T^3)$	$Y_{30} = 2G_6/T^3$
$Y_9 = \rho^2/T^3$	$Y_{20} = 2G_1/T^3$	$Y_{31} = 3G_6/T^4$
$Y_{10} = -\rho^3/3$	$Y_{21} = 3G_1/T^4$	$Y_{32} = 4G_6/T^5$
$Y_{11} = 0.0$	$Y_{22} = 2G_2/T^3$	

where the G_i and F are listed in Table 15.

The integral $\int [(P/\rho^2) - (RT/\rho)]_T d\rho$ may be written as:

$$\sum_{i=1}^{32} N_i Y_i$$

where the N_i are listed in Table 3 and the Y_i are listed below:

$Y_1 = \rho T$	$Y_{12} = \rho^3/(3T)$	$Y_{23} = G_2/T^4$
$Y_2 = \rho T^{1/2}$	$Y_{13} = \rho^4/4$	$Y_{24} = G_3/T^2$
$Y_3 = \rho$	$Y_{14} = \rho^5/(5T)$	$Y_{25} = G_3/T^3$
$Y_4 = \rho/T$	$Y_{15} = \rho^5/(5T^2)$	$Y_{26} = G_4/T^2$
$Y_5 = \rho/T^2$	$Y_{16} = \rho^6/(6T)$	$Y_{27} = G_4/T^4$
$Y_6 = \rho^2 T/2$	$Y_{17} = \rho^7/(7T)$	$Y_{28} = G_5/T^2$
$Y_7 = \rho^2/2$	$Y_{18} = \rho^7/(7T^2)$	$Y_{29} = G_5/T^3$
$Y_8 = \rho^2/(2T)$	$Y_{19} = \rho^8/(8T^2)$	$Y_{30} = G_6/T^2$
$Y_9 = \rho^2/(2T^2)$	$Y_{20} = G_1/T^2$	$Y_{31} = G_6/T^3$
$Y_{10} = \rho^3/3$	$Y_{21} = G_1/T^3$	$Y_{32} = G_6/T^4$
$Y_{11} = \rho^3/3$	$Y_{22} = G_2/T^2$	

where the G_i and F are listed in Table 15.

The integral, $\int [(T/\rho^2)(\partial^2 P/\partial T^2)]_T d\rho$ may be written as:

$$\sum_{i=1}^{32} N_i Y_i$$

where the N_i are listed in Table 3 and the Y_i are listed below:

$Y_1 = 0.0$	$Y_{12} = (2\rho^3)/(3T^2)$	$Y_{23} = 20G_2/T^5$
$Y_2 = \rho/(4T^3)$	$Y_{13} = 0.0$	$Y_{24} = 6G_3/T^3$
$Y_3 = 0.0$	$Y_{14} = (2\rho^5)/(5T^2)$	$Y_{25} = 12G_3/T^4$
$Y_4 = 2\rho/T^2$	$Y_{15} = (6\rho^5)/(5T^3)$	$Y_{26} = 6G_4/T^3$
$Y_5 = 6\rho/T^3$	$Y_{16} = \rho^6/(3T^2)$	$Y_{27} = 20G_4/T^5$
$Y_6 = 0.0$	$Y_{17} = (2\rho^7)/(7T^2)$	$Y_{28} = 6G_5/T^3$
$Y_7 = 0.0$	$Y_{18} = (6\rho^7)/(7T^3)$	$Y_{29} = 12G_5/T^4$
$Y_8 = \rho^2/T^2$	$Y_{19} = (3\rho^8)/(4T^3)$	$Y_{30} = 6G_6/T^3$
$Y_9 = 3\rho^2/T^3$	$Y_{20} = 6G_1/T^3$	$Y_{31} = 12G_6/T^4$
$Y_{10} = 0.0$	$Y_{21} = 12G_1/T^4$	$Y_{32} = 20G_6/T^5$
$Y_{11} = 0.0$	$Y_{22} = 6G_2/T^3$	

where the G_i and F are listed in Table 15.

TABLE 15
FUNCTIONS FOR DERIVATIVES OF THE
EQUATION OF STATE.

$F = \exp(-0.0056\rho^2)$
$G_1 = F/[2(-0.0056)]$
$G_2 = (F\rho^2 - 2G_1)/[2(-0.0056)]$
$G_3 = (F\rho^4 - 4G_2)/[2(-0.0056)]$
$G_4 = (F\rho^6 - 6G_3)/[2(-0.0056)]$
$G_5 = (F\rho^8 - 8G_4)/[2(-0.0056)]$
$G_6 = (F\rho^{10} - 10G_5)/[2(-0.0056)]$

The integral $\int C_p^0 dT$ may be written as:

$$\sum_{i=1}^8 N_i Y_i$$

where the N_i are listed in Table 7

$$Y_1 = -1/(2T^2)$$

$$Y_2 = -1/T$$

$$Y_3 = \ln(T)$$

$$Y_4 = T$$

$$Y_5 = T^2/2$$

$$Y_6 = T^3/3$$

$$Y_7 = T^4/4$$

$$Y_8 = UT/[\exp(U)-1]$$

$$U = N_9/T \text{ (} N_9 \text{ from Table 7)}$$

The integral $\int (C_p^0/T) dT$ may be written as:

$$\sum_{i=1}^8 N_i Y_i$$

where the N_i are listed in Table 7 and the Y_i are given below:

$$Y_1 = -1/(3T^3)$$

$$Y_2 = -1/(2T^2)$$

$$Y_3 = -1/T$$

$$Y_4 = \ln(T)$$

$$Y_5 = T$$

$$Y_6 = T^2/2$$

$$Y_7 = T^3/3$$

$$Y_8 = U/(EU-1) - \ln[1-(1/EU)]$$

$$U = N_9/T \text{ (} N_9 \text{ from Table 7)}$$

$$EU = \exp(U)$$

APPENDIX B

TABLE OF THERMODYNAMIC PROPERTIES OF NITROGEN IN BRITISH UNITS

(The number of significant figures given in the table is not justified on the basis of the uncertainty of the data, but is presented to maintain internal consistency.)

THERMODYNAMIC PROPERTIES OF SATURATED NITROGEN

TEMPERATURE	PRESSURE	DENSITY	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG R	PSIA	LB/CU FT	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB - R		FT/SEC
113.666	1.818	54.174 0.04214	1993.95 42.72	257.681 0.0163	-64.690 19.908	-64.684 27.895	0.58022 1.39546	0.228 0.179	0.467 0.253	4351. 529.
114	1.880	54.131 0.04347	1972.51 42.83	255.727 0.0168	-64.534 19.963	-64.528 27.972	0.58158 1.39375	0.229 0.179	0.468 0.253	4322. 529.
116	2.294	53.869 0.05220	1850.85 43.44	244.573 0.0202	-63.593 20.290	-63.585 28.427	0.58977 1.38375	0.234 0.179	0.474 0.254	4163. 533.
118	2.778	53.603 0.06226	1739.94 44.04	234.289 0.0242	-62.642 20.614	-62.632 28.876	0.59790 1.37417	0.238 0.180	0.478 0.254	4023. 537.
120	3.341	53.331 0.07377	1638.61 44.61	224.760 0.0287	-61.683 20.933	-61.671 29.320	0.60556 1.36499	0.241 0.180	0.482 0.255	3897. 541.
122	3.992	53.055 0.08689	1545.78 45.16	215.892 0.0338	-60.717 21.249	-60.702 29.758	0.61394 1.35618	0.242 0.180	0.484 0.256	3784. 545.
124	4.740	52.773 0.1017	1460.52 45.69	207.604 0.0397	-59.748 21.561	-59.731 30.189	0.62182 1.34772	0.243 0.181	0.486 0.257	3680. 549.
126	5.595	52.487 0.1185	1382.00 46.19	199.828 0.0464	-58.774 21.868	-58.755 30.614	0.62961 1.33959	0.243 0.181	0.488 0.258	3584. 553.
128	6.567	52.196 0.1372	1309.48 46.66	192.506 0.0538	-57.799 22.170	-57.775 31.031	0.63729 1.33178	0.243 0.181	0.489 0.260	3495. 556.
130	7.665	51.901 0.1582	1242.30 47.10	185.590 0.0622	-56.821 22.468	-56.794 31.440	0.64487 1.32426	0.242 0.182	0.490 0.261	3412. 560.
132	8.902	51.601 0.1815	1179.88 47.52	179.040 0.0716	-55.842 22.760	-55.810 31.842	0.65235 1.31702	0.241 0.182	0.491 0.262	3334. 563.
134	10.287	51.296 0.2073	1121.70 47.90	172.818 0.0820	-54.862 23.047	-54.825 32.235	0.65972 1.31004	0.240 0.183	0.491 0.264	3260. 566.
136	11.834	50.987 0.2359	1067.30 48.25	166.896 0.0936	-53.881 23.327	-53.838 32.619	0.66699 1.30330	0.239 0.183	0.492 0.265	3189. 569.
138	13.553	50.674 0.2672	1016.29 48.56	161.248 0.1064	-52.899 23.602	-52.849 32.994	0.67416 1.29678	0.238 0.184	0.493 0.267	3121. 572.
139.224	14.696	50.480 0.2879	986.57 48.74	157.914 0.1149	-52.297 23.767	-52.243 33.218	0.67850 1.29290	0.237 0.184	0.493 0.268	3081. 574.
140	15.457	50.356 0.3017	968.30 48.84	155.849 0.1205	-51.916 23.871	-51.859 33.359	0.68123 1.29048	0.237 0.184	0.493 0.269	3057. 575.
142	17.558	50.034 0.3393	923.02 49.08	150.681 0.1361	-50.933 24.132	-50.868 33.714	0.68821 1.28438	0.236 0.185	0.494 0.271	2994. 577.
144	19.869	49.708 0.3805	880.18 49.28	145.725 0.1532	-49.948 24.387	-49.874 34.058	0.69509 1.27846	0.235 0.186	0.495 0.273	2933. 580.
146	22.403	49.377 0.4252	839.53 49.45	140.967 0.1719	-48.962 24.635	-48.878 34.391	0.70190 1.27272	0.233 0.186	0.496 0.276	2875. 582.
148	25.174	49.043 0.4738	800.86 49.57	136.391 0.1924	-47.975 24.875	-47.880 34.713	0.70862 1.26714	0.232 0.187	0.497 0.278	2817. 585.
150	28.194	48.703 0.5265	763.99 49.64	131.985 0.2147	-46.987 25.107	-46.879 35.023	0.71526 1.26171	0.231 0.187	0.498 0.281	2761. 587.
152	31.477	48.360 0.5835	728.75 49.68	127.738 0.2391	-45.996 25.330	-45.875 35.320	0.72182 1.25642	0.230 0.188	0.500 0.283	2706. 589.
154	35.037	48.012 0.6450	695.01 49.66	123.639 0.2657	-45.003 25.546	-44.868 35.605	0.72832 1.25126	0.230 0.189	0.502 0.286	2653. 591.
156	38.888	47.659 0.7113	662.65 49.60	119.678 0.2945	-44.007 25.752	-43.856 35.876	0.73475 1.24621	0.229 0.190	0.504 0.290	2600. 592.
158	43.045	47.301 0.7827	631.55 49.49	115.846 0.3259	-43.009 25.949	-42.840 36.133	0.74112 1.24128	0.228 0.190	0.506 0.293	2548. 594.
160	47.520	46.939 0.8594	601.63 49.33	112.136 0.3598	-42.007 26.136	-41.819 36.376	0.74743 1.23646	0.227 0.191	0.508 0.297	2497. 595.

THERMODYNAMIC PROPERTIES OF SATURATED NITROGEN

TEMPERATURE DEG R	PRESSURE PSIA	DENSITY LB/CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
162	52.328	46.571 0.9417	572.80 49.12	108.539 0.3967	-41.001 26.313	-40.793 36.603	0.75368 1.23172	0.227 0.192	0.511 0.300	2446. 597.
164	57.484	46.198 1.030	545.00 48.86	105.049 0.4366	-39.991 26.479	-39.761 36.815	0.75989 1.22708	0.226 0.193	0.514 0.305	2396. 598.
166	63.002	45.819 1.124	518.16 48.54	101.659 0.4797	-38.977 26.635	-38.722 37.010	0.76605 1.22251	0.226 0.194	0.518 0.309	2347. 599.
168	68.897	45.435 1.226	492.23 48.16	98.363 0.5264	-37.957 26.779	-37.677 37.189	0.77217 1.21801	0.225 0.195	0.521 0.314	2298. 600.
170	75.182	45.045 1.334	467.16 47.73	95.155 0.5769	-36.932 26.910	-36.623 37.349	0.77825 1.21358	0.225 0.196	0.526 0.319	2249. 600.
172	81.873	44.648 1.449	442.91 47.24	92.030 0.6314	-35.902 27.029	-35.562 37.492	0.78429 1.20920	0.224 0.197	0.530 0.325	2201. 601.
174	88.984	44.245 1.572	419.45 46.69	88.983 0.6903	-34.864 27.135	-34.492 37.614	0.79031 1.20487	0.224 0.198	0.535 0.331	2153. 601.
176	96.530	43.834 1.704	396.72 46.08	86.010 0.7540	-33.820 27.226	-33.412 37.717	0.79630 1.20058	0.224 0.199	0.540 0.337	2106. 602.
178	104.527	43.416 1.844	374.71 45.41	83.106 0.8228	-32.768 27.303	-32.322 37.798	0.80226 1.19632	0.224 0.200	0.546 0.345	2059. 602.
180	112.990	42.991 1.994	353.38 44.67	80.268 0.8972	-31.708 27.364	-31.222 37.857	0.80821 1.19208	0.223 0.201	0.552 0.352	2012. 602.
182	121.934	42.557 2.154	332.70 43.86	77.490 0.9777	-30.640 27.409	-30.109 37.893	0.81414 1.18786	0.223 0.202	0.559 0.361	1965. 602.
184	131.376	42.114 2.324	312.65 42.98	74.769 1.065	-29.562 27.436	-28.984 37.903	0.82006 1.18365	0.223 0.204	0.567 0.370	1918. 601.
186	141.331	41.662 2.506	293.19 42.04	72.102 1.159	-28.474 27.445	-27.846 37.888	0.82598 1.17944	0.223 0.205	0.575 0.380	1871. 601.
188	151.816	41.200 2.700	274.31 41.01	69.485 1.261	-27.375 27.433	-26.693 37.844	0.83189 1.17521	0.223 0.206	0.584 0.392	1824. 600.
190	162.849	40.727 2.908	255.97 39.92	66.915 1.372	-26.264 27.400	-25.524 37.770	0.83781 1.17096	0.223 0.208	0.594 0.404	1777. 600.
192	174.447	40.242 3.130	238.16 38.74	64.387 1.493	-25.141 27.343	-24.338 37.664	0.84374 1.16668	0.223 0.209	0.605 0.418	1730. 599.
194	186.628	39.745 3.368	220.84 37.48	61.899 1.624	-24.003 27.262	-23.134 37.523	0.84969 1.16235	0.223 0.211	0.618 0.434	1683. 598.
196	199.410	39.234 3.623	204.00 36.14	59.446 1.768	-22.850 27.153	-21.909 37.345	0.85567 1.15797	0.223 0.213	0.632 0.452	1635. 596.
198	212.811	38.707 3.897	187.62 34.71	57.024 1.925	-21.680 27.014	-20.662 37.126	0.86167 1.15350	0.224 0.214	0.648 0.472	1587. 595.
200	226.851	38.164 4.192	171.67 33.19	54.628 2.097	-20.491 26.842	-19.390 36.863	0.86772 1.14895	0.224 0.216	0.666 0.495	1538. 594.
202	241.549	37.601 4.511	156.14 31.57	52.255 2.286	-19.280 26.634	-18.090 36.550	0.87383 1.14428	0.224 0.218	0.687 0.522	1489. 592.
204	256.925	37.017 4.856	141.02 29.85	49.899 2.495	-18.045 26.385	-16.759 36.182	0.88001 1.13947	0.225 0.220	0.711 0.554	1439. 590.
206	272.998	36.407 5.231	126.28 28.02	47.553 2.727	-16.781 26.090	-15.393 35.753	0.88623 1.13449	0.225 0.222	0.740 0.592	1388. 588.
208	289.788	35.769 5.641	111.93 26.09	45.209 2.986	-15.485 25.742	-13.985 35.254	0.89267 1.12932	0.226 0.225	0.775 0.638	1335. 586.
210	307.316	35.096 6.091	97.96 24.04	42.860 3.275	-14.150 25.333	-12.529 34.676	0.89920 1.12350	0.226 0.227	0.818 0.695	1281. 584.

THERMODYNAMIC PROPERTIES OF SATURATED NITROGEN

TEMPERATURE	PRESSURE	DENSITY	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOC OF SOUND
DEG R	PSIA	LB/CU FT	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB - R	- R	FT/S
212	325.602	34.382 6.589	84.38 21.86	40.494 3.603	-12.768 24.852	-11.014 34.004	0.90591 1.11818	0.227 0.230	0.872 0.767	1226 581
214	344.671	33.615 7.144	71.19 19.56	38.095 3.977	-11.327 24.285	-9.428 33.220	0.91287 1.11209	0.228 0.233	0.943 0.861	1168 579
216	364.548	32.782 7.772	58.42 17.11	35.644 4.409	-9.811 23.612	-7.751 32.298	0.92015 1.10550	0.229 0.236	1.039 0.988	1108 576
218	385.264	31.860 8.494	46.10 14.52	33.111 4.918	-8.193 22.800	-5.954 31.200	0.92739 1.09827	0.231 0.239	1.176 1.172	1044 574
220	406.863	30.811 9.346	34.30 11.75	30.448 5.532	-6.432 21.800	-3.986 29.862	0.93629 1.09010	0.233 0.243	1.393 1.458	975 571
222	429.410	29.563 10.396	23.13 8.79	27.571 6.306	-4.446 20.516	-1.756 28.165	0.94576 1.08051	0.235 0.248	1.781 1.969	900 569
224	453.013	27.952 11.801	12.79 5.59	24.295 7.363	-2.048 18.731	0.953 25.840	0.95722 1.06831	0.240 0.253	2.690 3.140	816 567
226	477.892	25.368 14.141	3.78 2.10	19.982 9.153	1.460 15.661	4.949 21.919	0.97421 1.04930	0.247 0.260	7.123 8.595	710 568
227.160	493.123	19.604	-0.00	13.528	8.589	13.247	1.01026	0.262		595

THERMODYNAMIC PROPERTIES OF NITROGEN

0.10 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*113.668	0.00230	43.50	0.001	20.054	28.113	1.60247	0.177	0.249	531.
115	0.00227	44.01	0.001	20.291	28.445	1.60537	0.177	0.249	534.
120	0.00218	45.93	0.001	21.178	29.687	1.61595	0.177	0.248	546.
125	0.00209	47.85	0.001	22.066	30.929	1.62609	0.177	0.248	557.
130	0.00201	49.77	0.001	22.953	32.171	1.63583	0.177	0.248	568.
135	0.00193	51.68	0.001	23.840	33.413	1.64521	0.177	0.248	579.
140	0.00187	53.60	0.001	24.727	34.655	1.65424	0.177	0.248	590.
145	0.00180	55.52	0.001	25.614	35.897	1.66296	0.177	0.248	600.
150	0.00174	57.43	0.001	26.501	37.139	1.67138	0.177	0.248	610.
155	0.00168	59.35	0.001	27.388	38.381	1.67952	0.177	0.248	621.
160	0.00163	61.27	0.001	28.275	39.622	1.68740	0.177	0.248	630.
165	0.00158	63.19	0.001	29.161	40.864	1.69504	0.177	0.248	640.
170	0.00154	65.10	0.001	30.048	42.106	1.70246	0.177	0.248	650.
175	0.00149	67.02	0.001	30.935	43.347	1.70966	0.177	0.248	659.
180	0.00145	68.93	0.001	31.822	44.589	1.71665	0.177	0.248	669.
185	0.00141	70.85	0.001	32.708	45.830	1.72345	0.177	0.248	678.
190	0.00137	72.77	0.001	33.595	47.072	1.73008	0.177	0.248	687.
195	0.00134	74.68	0.001	34.482	48.313	1.73653	0.177	0.248	696.
200	0.00131	76.60	0.001	35.368	49.555	1.74281	0.177	0.248	705.
205	0.00127	78.52	0.000	36.255	50.796	1.74894	0.177	0.248	714.
210	0.00124	80.43	0.000	37.142	52.038	1.75493	0.177	0.248	722.
215	0.00121	82.35	0.000	38.028	53.280	1.76077	0.177	0.248	731.
220	0.00119	84.26	0.000	38.915	54.522	1.76648	0.177	0.248	739.
225	0.00116	86.18	0.000	39.802	55.766	1.77207	0.177	0.248	748.
230	0.00113	88.09	0.000	40.688	57.003	1.77751	0.177	0.248	756.
235	0.00111	90.01	0.000	41.575	58.245	1.78285	0.177	0.248	764.
240	0.00109	91.93	0.000	42.461	59.486	1.78808	0.177	0.248	772.
245	0.00107	93.84	0.000	43.348	60.727	1.79320	0.177	0.248	780.
250	0.00104	95.76	0.000	44.234	61.969	1.79821	0.177	0.248	788.
260	0.00100	99.59	0.000	46.008	64.451	1.80795	0.177	0.248	804.
270	0.00097	103.42	0.000	47.781	66.934	1.81732	0.177	0.248	819.
280	0.00093	107.25	0.000	49.554	69.416	1.82635	0.177	0.248	834.
290	0.00090	111.08	0.000	51.327	71.898	1.83506	0.177	0.248	849.
300	0.00087	114.91	0.000	53.100	74.381	1.84347	0.177	0.248	863.
320	0.00082	122.58	0.000	56.646	79.346	1.85949	0.177	0.248	892.
340	0.00077	130.24	0.000	60.192	84.310	1.87454	0.177	0.248	919.
360	0.00073	137.90	0.000	63.738	89.275	1.88873	0.177	0.248	946.
380	0.00069	145.56	0.000	67.283	94.239	1.90215	0.177	0.248	972.
400	0.00065	153.23	0.000	70.829	99.204	1.91488	0.177	0.248	997.
420	0.00062	160.89	0.000	74.375	104.168	1.92699	0.177	0.248	1022.
440	0.00059	168.55	0.000	77.921	109.133	1.93854	0.177	0.248	1046.
460	0.00057	176.21	0.000	81.467	114.097	1.94958	0.177	0.248	1069.
480	0.00054	183.87	0.000	85.013	119.062	1.96014	0.177	0.248	1092.
500	0.00052	191.53	0.000	88.559	124.027	1.97028	0.177	0.248	1115.
520	0.00050	199.20	0.000	92.106	128.993	1.98001	0.177	0.248	1137.
540	0.00048	206.86	0.000	95.653	133.959	1.98938	0.177	0.248	1158.
560	0.00047	214.52	0.000	99.201	138.926	1.99842	0.177	0.248	1180.
580	0.00045	222.18	0.000	102.750	143.893	2.00713	0.177	0.248	1200.
600	0.00044	229.84	0.000	106.301	148.863	2.01555	0.178	0.248	1221.
650	0.00040	249.00	0.000	115.184	161.293	2.03545	0.178	0.249	1270.
700	0.00037	268.15	0.000	124.084	173.740	2.05390	0.178	0.249	1318.
750	0.00035	287.30	0.000	133.006	186.208	2.07111	0.179	0.250	1364.
800	0.00033	306.46	0.000	141.957	198.707	2.08724	0.179	0.250	1408.
850	0.00031	325.61	0.000	150.946	211.242	2.10244	0.180	0.251	1450.
900	0.00029	344.77	0.000	159.979	223.822	2.11682	0.181	0.252	1491.
950	0.00027	363.92	0.000	169.064	236.453	2.13048	0.182	0.253	1530.
1000	0.00026	383.07	0.000	178.206	249.143	2.14349	0.183	0.254	1569.
1100	0.00024	421.38	0.000	196.685	274.716	2.16787	0.186	0.257	1642.
1200	0.00022	459.69	0.000	215.452	300.576	2.19037	0.189	0.260	1711.
1300	0.00020	498.00	0.000	234.527	326.745	2.21131	0.192	0.263	1777.
1400	0.00019	536.30	0.000	253.920	353.231	2.23094	0.196	0.266	1840.
1500	0.00017	574.61	0.000	273.631	380.036	2.24943	0.199	0.270	1901.
2000	0.00013	766.15	0.000	376.593	518.466	2.32898	0.213	0.283	2176.
2500	0.00010	957.68	0.000	485.486	662.828	2.39337	0.222	0.293	2419.
3000	0.00009	1149.22	0.000	598.518	811.328	2.44750	0.229	0.300	2640.
3500	0.00007	1340.75	0.000	714.412	962.691	2.49415	0.234	0.305	2845.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

0.50 PSIA ISORAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.669	0.01151	43.32	0.004	20.021	28.063	1.48801	0.178	0.250	531.
115	0.01138	43.83	0.004	20.258	28.395	1.49092	0.178	0.249	534.
120	0.01090	45.77	0.004	21.148	29.642	1.50153	0.178	0.249	545.
125	0.01046	47.70	0.004	22.038	30.888	1.51170	0.178	0.249	557.
130	0.01006	49.63	0.004	22.928	32.134	1.52147	0.178	0.249	568.
135	0.00968	51.56	0.004	23.817	33.379	1.53087	0.178	0.249	579.
140	0.00934	53.48	0.004	24.706	34.623	1.53992	0.178	0.249	589.
145	0.00901	55.41	0.003	25.594	35.867	1.54865	0.178	0.249	600.
150	0.00871	57.33	0.003	26.482	37.111	1.55709	0.177	0.249	610.
155	0.00843	59.25	0.003	27.371	38.355	1.56524	0.177	0.249	620.
160	0.00817	61.18	0.003	28.258	39.598	1.57314	0.177	0.249	630.
165	0.00792	63.10	0.003	29.146	40.841	1.58079	0.177	0.249	640.
170	0.00768	65.02	0.003	30.034	42.084	1.58821	0.177	0.249	650.
175	0.00746	66.94	0.003	30.921	43.327	1.59541	0.177	0.249	659.
180	0.00726	68.86	0.003	31.809	44.570	1.60241	0.177	0.249	669.
185	0.00706	70.78	0.003	32.696	45.812	1.60922	0.177	0.248	678.
190	0.00697	72.70	0.003	33.583	47.055	1.61585	0.177	0.248	687.
195	0.00670	74.62	0.003	34.471	48.298	1.62231	0.177	0.248	696.
200	0.00653	76.54	0.003	35.358	49.541	1.62860	0.177	0.248	705.
205	0.00637	78.46	0.002	36.245	50.784	1.63474	0.177	0.248	714.
210	0.00622	80.38	0.002	37.132	52.022	1.64071	0.177	0.248	722.
215	0.00607	82.30	0.002	38.019	53.264	1.64655	0.177	0.248	731.
220	0.00594	84.21	0.002	38.906	54.506	1.65226	0.177	0.248	739.
225	0.00580	86.13	0.002	39.793	55.748	1.65785	0.177	0.248	748.
230	0.00568	88.05	0.002	40.680	56.995	1.66332	0.177	0.248	756.
235	0.00555	89.97	0.002	41.567	58.236	1.66866	0.177	0.248	764.
240	0.00544	91.88	0.002	42.454	59.478	1.67389	0.177	0.248	772.
245	0.00533	93.80	0.002	43.340	60.719	1.67901	0.177	0.248	780.
250	0.00522	95.72	0.002	44.227	61.961	1.68403	0.177	0.248	788.
260	0.00502	99.55	0.002	46.001	64.444	1.69377	0.177	0.248	804.
270	0.00493	103.39	0.002	47.774	66.927	1.70314	0.177	0.248	819.
280	0.00466	107.22	0.002	49.548	69.410	1.71216	0.177	0.248	834.
290	0.00450	111.06	0.002	51.321	71.892	1.72088	0.177	0.248	849.
300	0.00435	114.89	0.002	53.094	74.375	1.72929	0.177	0.248	863.
320	0.00408	122.55	0.002	56.641	79.340	1.74532	0.177	0.248	892.
340	0.00384	130.22	0.001	60.187	84.305	1.76037	0.177	0.248	919.
360	0.00363	137.89	0.001	63.733	89.270	1.77455	0.177	0.248	946.
380	0.00343	145.55	0.001	67.279	94.235	1.78798	0.177	0.248	972.
400	0.00326	153.21	0.001	70.826	99.200	1.80071	0.177	0.248	997.
420	0.00311	160.88	0.001	74.372	104.165	1.81282	0.177	0.248	1022.
440	0.00297	168.54	0.001	77.918	109.130	1.82437	0.177	0.248	1046.
460	0.00284	176.20	0.001	81.464	114.094	1.83540	0.177	0.248	1069.
480	0.00272	183.87	0.001	85.010	119.059	1.84597	0.177	0.248	1092.
500	0.00261	191.53	0.001	88.556	124.025	1.85610	0.177	0.248	1115.
520	0.00251	199.19	0.001	92.103	128.990	1.86584	0.177	0.248	1137.
540	0.00242	206.86	0.001	95.651	133.956	1.87521	0.177	0.248	1158.
560	0.00233	214.52	0.001	99.199	138.923	1.88424	0.177	0.248	1180.
580	0.00225	222.18	0.001	102.748	143.891	1.89296	0.177	0.248	1200.
600	0.00218	229.84	0.001	106.298	148.861	1.90138	0.178	0.249	1221.
650	0.00201	249.00	0.001	115.183	161.292	1.92128	0.178	0.249	1270.
700	0.00186	268.15	0.001	124.082	173.738	1.93973	0.178	0.249	1318.
750	0.00174	287.31	0.001	133.004	186.207	1.95694	0.179	0.250	1364.
800	0.00163	306.46	0.001	141.956	198.706	1.97307	0.179	0.250	1408.
850	0.00154	325.62	0.001	150.945	211.241	1.98827	0.180	0.251	1450.
900	0.00145	344.77	0.001	159.978	223.821	2.00265	0.181	0.252	1491.
950	0.00137	363.93	0.001	169.062	236.453	2.01631	0.182	0.253	1531.
1000	0.00131	383.08	0.001	178.205	249.142	2.02932	0.183	0.254	1569.
1100	0.00119	421.39	0.000	196.685	274.715	2.05370	0.186	0.257	1642.
1200	0.00109	459.70	0.000	215.451	300.576	2.07620	0.189	0.260	1711.
1300	0.00100	498.01	0.000	234.526	326.744	2.09714	0.192	0.263	1777.
1400	0.00093	536.31	0.000	253.919	353.231	2.11677	0.196	0.266	1840.
1500	0.00087	574.62	0.000	273.630	380.036	2.13526	0.199	0.270	1901.
2000	0.00065	766.16	0.000	376.592	518.467	2.21481	0.213	0.283	2176.
2500	0.00052	957.70	0.000	485.486	662.829	2.27920	0.222	0.293	2419.
3000	0.00044	1149.23	0.000	598.518	811.329	2.33333	0.229	0.300	2640.
3500	0.00037	1340.77	0.000	714.412	962.692	2.37998	0.234	0.305	2845.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*113.670	0.02308	43.09	0.009	19.979	28.000	1.43847	0.178	0.251	530.
115	0.02281	43.61	0.009	20.217	28.334	1.44139	0.178	0.251	533.
120	0.02185	45.57	0.008	21.111	29.586	1.45205	0.178	0.250	545.
125	0.02096	47.51	0.008	22.004	30.837	1.46226	0.178	0.250	556.
130	0.02015	49.46	0.008	22.897	32.087	1.47206	0.178	0.250	567.
135	0.01940	51.40	0.007	23.788	33.335	1.48149	0.178	0.250	578.
140	0.01870	53.33	0.007	24.679	34.583	1.49056	0.178	0.249	589.
145	0.01805	55.27	0.007	25.570	35.830	1.49931	0.178	0.249	599.
150	0.01744	57.20	0.007	26.459	37.076	1.50776	0.178	0.249	610.
155	0.01698	59.13	0.006	27.349	38.322	1.51593	0.178	0.249	620.
160	0.01635	61.06	0.006	28.238	39.567	1.52384	0.178	0.249	630.
165	0.01585	62.99	0.006	29.127	40.812	1.53150	0.178	0.249	640.
170	0.01538	64.92	0.006	30.016	42.057	1.53893	0.178	0.249	649.
175	0.01494	66.84	0.006	30.904	43.302	1.54615	0.177	0.249	659.
180	0.01452	68.77	0.006	31.793	44.546	1.55316	0.177	0.249	668.
185	0.01413	70.69	0.005	32.681	45.788	1.55997	0.177	0.249	678.
190	0.01376	72.62	0.005	33.569	47.031	1.56660	0.177	0.249	687.
195	0.01340	74.54	0.005	34.457	48.275	1.57306	0.177	0.249	696.
200	0.01307	76.46	0.005	35.344	49.518	1.57935	0.177	0.249	705.
205	0.01275	78.39	0.005	36.232	50.761	1.58549	0.177	0.249	713.
210	0.01244	80.31	0.005	37.120	52.004	1.59148	0.177	0.249	722.
215	0.01215	82.23	0.005	38.007	53.246	1.59733	0.177	0.249	731.
220	0.01187	84.15	0.005	38.895	54.489	1.60304	0.177	0.249	739.
225	0.01161	86.07	0.004	39.782	55.732	1.60863	0.177	0.248	747.
230	0.01136	87.99	0.004	40.669	56.974	1.61409	0.177	0.248	756.
235	0.01112	89.91	0.004	41.557	58.216	1.61943	0.177	0.248	764.
240	0.01098	91.83	0.004	42.444	59.459	1.62466	0.177	0.248	772.
245	0.01066	93.75	0.004	43.331	60.701	1.62979	0.177	0.248	780.
250	0.01045	95.67	0.004	44.218	61.943	1.63481	0.177	0.248	788.
260	0.01004	99.51	0.004	45.992	64.427	1.64455	0.177	0.248	804.
270	0.00967	103.35	0.004	47.766	66.911	1.65392	0.177	0.248	819.
280	0.00933	107.18	0.004	49.540	69.395	1.66296	0.177	0.248	834.
290	0.00900	111.02	0.003	51.314	71.879	1.67167	0.177	0.248	849.
300	0.00870	114.86	0.003	53.087	74.362	1.68009	0.177	0.248	863.
320	0.00816	122.53	0.003	56.634	79.329	1.69612	0.177	0.248	892.
340	0.00768	130.20	0.003	60.181	84.295	1.71117	0.177	0.248	919.
360	0.00725	137.86	0.003	63.728	89.265	1.72537	0.177	0.248	946.
380	0.00687	145.53	0.003	67.275	94.230	1.73880	0.177	0.248	972.
400	0.00653	153.20	0.003	70.821	99.195	1.75153	0.177	0.248	997.
420	0.00622	160.86	0.002	74.367	104.161	1.76364	0.177	0.248	1022.
440	0.00593	168.53	0.002	77.913	109.126	1.77519	0.177	0.249	1046.
460	0.00567	176.20	0.002	81.460	114.091	1.78623	0.177	0.248	1069.
480	0.00544	183.86	0.002	85.006	119.056	1.79679	0.177	0.248	1092.
500	0.00522	191.53	0.002	88.553	124.021	1.80693	0.177	0.248	1115.
520	0.00502	199.19	0.002	92.100	128.987	1.81667	0.177	0.248	1137.
540	0.00483	206.85	0.002	95.647	133.953	1.82604	0.177	0.248	1158.
560	0.00466	214.52	0.002	99.196	138.921	1.83507	0.177	0.248	1180.
580	0.00450	222.18	0.002	102.745	143.889	1.84379	0.177	0.248	1200.
600	0.00435	229.84	0.002	106.296	148.858	1.85221	0.178	0.249	1221.
650	0.00402	249.00	0.002	115.180	161.289	1.87211	0.178	0.249	1270.
700	0.00373	268.16	0.001	124.080	173.736	1.89056	0.178	0.249	1318.
750	0.00348	287.32	0.001	133.002	186.205	1.90776	0.179	0.250	1364.
800	0.00326	306.47	0.001	141.954	198.704	1.92390	0.179	0.250	1408.
850	0.00307	325.63	0.001	150.943	211.240	1.93910	0.180	0.251	1450.
900	0.00290	344.78	0.001	159.976	223.820	1.95348	0.181	0.252	1491.
950	0.00275	363.94	0.001	169.061	236.452	1.96714	0.182	0.253	1531.
1000	0.00261	383.09	0.001	178.204	249.141	1.98015	0.183	0.254	1569.
1100	0.00237	421.40	0.001	196.683	274.714	2.00452	0.186	0.257	1642.
1200	0.00218	459.71	0.001	215.450	300.575	2.02702	0.189	0.260	1711.
1300	0.00201	498.02	0.001	234.526	326.744	2.04797	0.192	0.263	1777.
1400	0.00186	536.33	0.001	253.919	353.231	2.06760	0.196	0.266	1840.
1500	0.00174	574.64	0.001	273.630	380.035	2.08609	0.199	0.270	1901.
2000	0.00131	766.18	0.001	376.592	518.468	2.16564	0.213	0.293	2176.
2500	0.00104	957.71	0.000	485.486	662.830	2.23003	0.222	0.293	2419.
3000	0.00087	1149.25	0.000	598.518	811.331	2.28416	0.229	0.300	2640.
3500	0.00075	1340.78	0.000	714.412	962.693	2.33082	0.234	0.305	2845.

* INDICATES TWO PHASE BOUNDARY

5 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY HTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.681	54.17365	1993.61	257.6	-64.686	-64.669	0.58025	0.228	0.467	4349.
115	54.00216	1910.81	250.0	-64.068	-64.051	0.58566	0.232	0.471	4240.
120	53.33224	1638.92	224.8	-61.684	-61.667	0.60594	0.241	0.482	3897.
*124.636	52.68304	1434.87	205.1	-59.439	-59.421	0.62431	0.243	0.487	3648.
*124.636	0.10604	45.85	0.042	21.659	30.325	1.34510	0.181	0.258	550.
125	0.10651	46.00	0.042	21.726	30.419	1.34585	0.181	0.258	551.
130	0.10219	48.06	0.040	22.642	31.703	1.35593	0.180	0.256	563.
135	0.09821	50.10	0.039	23.555	32.982	1.36558	0.180	0.255	574.
140	0.09455	52.13	0.037	24.464	34.256	1.37485	0.179	0.254	585.
145	0.09116	54.15	0.035	25.370	35.526	1.38376	0.179	0.254	596.
150	0.08802	56.15	0.034	26.273	36.793	1.39235	0.179	0.253	607.
155	0.08509	58.15	0.033	27.175	38.057	1.40064	0.179	0.253	617.
160	0.08235	60.14	0.032	28.075	39.318	1.40865	0.179	0.252	627.
165	0.07979	62.12	0.031	28.974	40.578	1.41640	0.178	0.252	637.
170	0.07739	64.09	0.030	29.871	41.835	1.42391	0.178	0.251	647.
175	0.07513	66.07	0.029	30.768	43.092	1.43119	0.178	0.251	657.
180	0.07300	68.03	0.028	31.663	44.346	1.43826	0.178	0.251	666.
185	0.07099	69.99	0.027	32.558	45.600	1.44513	0.178	0.251	676.
190	0.06909	71.95	0.027	33.452	46.853	1.45181	0.178	0.250	685.
195	0.06729	73.91	0.026	34.345	48.104	1.45832	0.178	0.250	694.
200	0.06558	75.86	0.025	35.238	49.355	1.46465	0.178	0.250	703.
205	0.06396	77.81	0.025	36.130	50.605	1.47082	0.178	0.250	712.
210	0.06242	79.76	0.024	37.022	51.855	1.47684	0.178	0.250	721.
215	0.06095	81.71	0.023	37.913	53.104	1.48272	0.178	0.250	729.
220	0.05955	83.65	0.023	38.804	54.352	1.48846	0.178	0.250	738.
225	0.05821	85.59	0.022	39.695	55.600	1.49407	0.178	0.250	746.
230	0.05693	87.53	0.022	40.585	56.848	1.49955	0.178	0.249	755.
235	0.05571	89.47	0.021	41.475	58.095	1.50492	0.178	0.249	763.
240	0.05454	91.41	0.021	42.365	59.341	1.51017	0.178	0.249	771.
245	0.05342	93.35	0.021	43.255	60.588	1.51531	0.178	0.249	779.
250	0.05234	95.28	0.020	44.144	61.834	1.52034	0.178	0.249	787.
260	0.05031	99.15	0.019	45.923	64.325	1.53011	0.177	0.249	803.
270	0.04844	103.02	0.019	47.701	66.816	1.53951	0.177	0.249	818.
280	0.04670	106.88	0.018	49.478	69.305	1.54857	0.177	0.249	833.
290	0.04508	110.74	0.017	51.255	71.794	1.55730	0.177	0.249	848.
300	0.04357	114.60	0.017	53.032	74.283	1.56574	0.177	0.249	863.
320	0.04084	122.30	0.016	56.584	79.258	1.58179	0.177	0.249	891.
340	0.03842	130.01	0.015	60.135	84.231	1.59687	0.177	0.249	919.
360	0.03628	137.70	0.014	63.685	89.203	1.61108	0.177	0.249	946.
380	0.03437	145.39	0.013	67.235	94.175	1.62452	0.177	0.249	972.
400	0.03265	153.08	0.013	70.784	99.145	1.63726	0.177	0.248	997.
420	0.03109	160.77	0.012	74.333	104.114	1.64939	0.177	0.248	1022.
440	0.02967	168.45	0.011	77.881	109.084	1.66095	0.177	0.248	1046.
460	0.02838	176.13	0.011	81.429	114.052	1.67199	0.177	0.248	1069.
480	0.02720	183.81	0.010	84.977	119.021	1.68256	0.177	0.248	1092.
500	0.02611	191.48	0.010	88.526	123.989	1.69270	0.177	0.248	1115.
520	0.02510	199.16	0.010	92.074	128.958	1.70245	0.177	0.248	1137.
540	0.02417	206.83	0.009	95.623	133.926	1.71182	0.177	0.248	1158.
560	0.02331	214.51	0.009	99.172	138.896	1.72086	0.177	0.248	1180.
580	0.02250	222.18	0.009	102.723	143.866	1.72958	0.178	0.249	1201.
600	0.02175	229.85	0.008	106.275	148.838	1.73801	0.178	0.249	1221.
650	0.02008	249.03	0.008	115.161	161.272	1.75791	0.178	0.249	1271.
700	0.01864	268.20	0.007	124.063	173.723	1.77637	0.178	0.249	1318.
750	0.01740	287.37	0.007	132.987	186.195	1.79358	0.179	0.250	1364.
800	0.01631	306.53	0.006	141.940	198.696	1.80971	0.179	0.250	1408.
850	0.01535	325.70	0.006	150.930	211.234	1.82491	0.180	0.251	1450.
900	0.01450	344.86	0.006	159.964	223.816	1.83930	0.181	0.252	1491.
950	0.01374	364.02	0.005	169.050	236.449	1.85296	0.182	0.253	1531.
1000	0.01305	383.18	0.005	178.193	249.140	1.86598	0.183	0.254	1569.
1100	0.01186	421.50	0.005	196.675	274.716	1.89035	0.186	0.257	1642.
1200	0.01088	459.82	0.004	215.443	300.579	1.91285	0.189	0.260	1712.
1300	0.01004	498.13	0.004	234.519	326.750	1.93380	0.192	0.263	1777.
1400	0.00932	536.45	0.004	253.913	353.238	1.95343	0.196	0.266	1840.
1500	0.00870	574.76	0.003	273.625	380.044	1.97192	0.199	0.270	1901.
2000	0.00653	766.31	0.003	376.589	518.476	2.05147	0.213	0.283	2176.
2500	0.00522	957.85	0.002	485.484	662.840	2.11586	0.222	0.293	2419.
3000	0.00435	1149.39	0.002	598.518	811.342	2.16999	0.229	0.300	2641.
3500	0.00373	1340.93	0.001	714.412	962.705	2.21665	0.234	0.305	2845.

* INDICATES TWO PHASE BOUNDARY

10 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY HTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*113.695	54.17440	1993.69	257.5	-64.684	-64.650	0.58026	0.228	0.467	4347.
115	54.00478	1911.77	250.0	-64.073	-64.038	0.58561	0.232	0.471	4239.
120	53.33529	1639.85	224.7	-61.690	-61.655	0.60590	0.241	0.491	3897.
125	52.63442	1421.36	203.6	-59.267	-59.232	0.62568	0.243	0.487	3631.
130	51.90279	1242.72	185.6	-56.924	-56.788	0.64485	0.242	0.490	3412.
*133.603	51.35700	1132.93	174.0	-55.056	-55.020	0.65826	0.241	0.491	3274.
*133.603	0.20200	47.83	0.080	22.990	32.157	1.31140	0.183	0.254	565.
135	0.19970	48.43	0.079	23.252	32.525	1.31414	0.182	0.263	569.
140	0.19191	50.59	0.075	24.186	33.835	1.32367	0.182	0.261	580.
145	0.18475	52.71	0.072	25.113	35.136	1.33280	0.181	0.260	591.
150	0.17814	54.81	0.070	26.035	36.430	1.34158	0.181	0.258	603.
155	0.17201	56.90	0.067	26.953	37.719	1.35002	0.180	0.257	613.
160	0.16632	58.96	0.065	27.868	39.002	1.35817	0.180	0.256	624.
165	0.16101	61.01	0.063	28.779	40.280	1.36604	0.180	0.255	634.
170	0.15604	63.05	0.061	29.688	41.555	1.37365	0.179	0.255	644.
175	0.15138	65.08	0.059	30.594	42.827	1.38103	0.179	0.254	654.
180	0.14700	67.10	0.057	31.499	44.096	1.38818	0.179	0.254	664.
185	0.14288	69.11	0.055	32.402	45.363	1.39512	0.179	0.253	673.
190	0.13899	71.12	0.054	33.303	46.627	1.40186	0.179	0.253	683.
195	0.13531	73.11	0.052	34.204	47.889	1.40842	0.178	0.252	692.
200	0.13182	75.11	0.051	35.103	49.150	1.41480	0.178	0.252	701.
205	0.12852	77.09	0.050	36.001	50.410	1.42102	0.178	0.252	710.
210	0.12538	79.07	0.048	36.898	51.667	1.42709	0.178	0.251	719.
215	0.12239	81.05	0.047	37.794	52.924	1.43300	0.178	0.251	728.
220	0.11955	83.02	0.046	38.690	54.180	1.43877	0.178	0.251	737.
225	0.11683	84.99	0.045	39.585	55.435	1.44441	0.178	0.251	745.
230	0.11424	86.96	0.044	40.479	56.689	1.44992	0.178	0.251	754.
235	0.11177	88.92	0.043	41.373	57.942	1.45531	0.178	0.251	762.
240	0.10940	90.89	0.042	42.267	59.194	1.46059	0.178	0.250	770.
245	0.10713	92.84	0.041	43.160	60.446	1.46575	0.178	0.250	778.
250	0.10495	94.80	0.040	44.052	61.697	1.47080	0.178	0.250	786.
260	0.10085	98.71	0.039	45.836	64.197	1.48061	0.178	0.250	802.
270	0.09707	102.61	0.037	47.619	66.696	1.49004	0.178	0.250	818.
280	0.09356	106.50	0.036	49.401	69.193	1.49912	0.178	0.250	833.
290	0.09030	110.39	0.035	51.182	71.688	1.50788	0.178	0.249	848.
300	0.08726	114.27	0.034	52.962	74.183	1.51634	0.178	0.249	862.
320	0.08176	122.03	0.031	56.520	79.168	1.53242	0.177	0.249	891.
340	0.07692	129.77	0.030	60.077	84.151	1.54753	0.177	0.249	919.
360	0.07262	137.50	0.028	63.632	89.131	1.56176	0.177	0.249	945.
380	0.06878	145.22	0.026	67.185	94.109	1.57522	0.177	0.249	972.
400	0.06533	152.93	0.025	70.738	99.085	1.58798	0.177	0.249	997.
420	0.06220	160.64	0.024	74.289	104.060	1.60011	0.177	0.249	1022.
440	0.05937	168.34	0.023	77.840	109.033	1.61168	0.177	0.249	1046.
460	0.05678	176.04	0.022	81.391	114.006	1.62274	0.177	0.249	1069.
480	0.05441	183.74	0.021	84.941	118.978	1.63332	0.177	0.249	1092.
500	0.05222	191.43	0.020	88.492	123.950	1.64346	0.177	0.249	1115.
520	0.05021	199.12	0.019	92.042	128.922	1.65321	0.177	0.249	1137.
540	0.04835	206.81	0.019	95.592	133.893	1.66260	0.177	0.249	1159.
560	0.04662	214.49	0.018	99.143	138.865	1.67164	0.177	0.249	1180.
580	0.04501	222.18	0.017	102.695	143.838	1.68036	0.178	0.249	1201.
600	0.04351	229.86	0.017	106.248	148.811	1.68879	0.178	0.249	1221.
650	0.04016	249.05	0.015	115.137	161.251	1.70871	0.178	0.249	1271.
700	0.03729	268.24	0.014	124.042	173.706	1.72717	0.178	0.249	1318.
750	0.03480	287.43	0.013	132.967	186.181	1.74438	0.179	0.250	1364.
800	0.03262	306.61	0.013	141.922	198.685	1.76052	0.179	0.250	1408.
850	0.03070	325.78	0.012	150.914	211.226	1.77572	0.180	0.251	1451.
900	0.02900	344.96	0.011	159.950	223.810	1.79011	0.181	0.252	1492.
950	0.02747	364.13	0.011	169.036	236.445	1.80377	0.182	0.253	1531.
1000	0.02610	383.29	0.010	178.181	249.138	1.81679	0.183	0.254	1569.
1100	0.02372	421.63	0.009	196.664	274.717	1.84117	0.186	0.257	1643.
1200	0.02175	459.95	0.008	215.433	300.582	1.86367	0.189	0.260	1712.
1300	0.02007	498.27	0.008	234.511	326.754	1.88462	0.192	0.263	1778.
1400	0.01864	536.59	0.007	253.906	353.244	1.90425	0.196	0.266	1841.
1500	0.01740	574.91	0.007	273.618	380.051	1.92275	0.199	0.270	1901.
2000	0.01305	766.48	0.005	376.586	518.490	2.00230	0.213	0.293	2176.
2500	0.01044	958.03	0.004	485.482	662.856	2.06669	0.222	0.293	2420.
3000	0.00870	1149.57	0.003	598.517	811.359	2.12082	0.229	0.300	2641.
3500	0.00746	1361.10	0.003	714.412	962.723	2.16748	0.234	0.305	2846.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

14.696 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.707 115	54.17510 54.00724	1993.76 1912.67	257.3 249.9	-64.683 -64.077	-64.632 -64.027	0.58028 0.58558	0.228 0.232	0.467 0.471	4345. 4239.
120	53.33815	1640.73	224.7	-61.695	-61.644	0.60586	0.241	0.491	3897.
125	52.63773	1422.22	203.6	-59.273	-59.221	0.62564	0.243	0.487	3631.
130	51.90657	1243.57	185.6	-56.830	-56.778	0.64480	0.242	0.490	3412.
135	51.14556	1094.71	169.8	-54.377	-54.324	0.66333	0.240	0.492	3224.
*139.225	50.47976	986.57	157.9	-52.297	-52.243	0.67850	0.237	0.493	3081.
*139.225	0.28795	48.74	0.115	23.767	33.218	1.29290	0.184	0.268	574.
140	0.28613	49.09	0.114	23.915	33.426	1.29439	0.184	0.263	575.
145	0.27502	51.33	0.109	24.864	34.759	1.30375	0.183	0.265	587.
150	0.26493	53.53	0.105	25.805	36.081	1.31271	0.182	0.263	599.
155	0.25543	55.70	0.101	26.740	37.394	1.32132	0.182	0.262	610.
160	0.24673	57.84	0.097	27.668	38.698	1.32960	0.181	0.260	620.
165	0.23864	59.96	0.094	28.592	39.996	1.33759	0.181	0.259	631.
170	0.23110	62.06	0.090	29.512	41.288	1.34530	0.180	0.258	641.
175	0.22406	64.15	0.089	30.429	42.575	1.35276	0.180	0.257	652.
180	0.21745	66.22	0.085	31.343	43.858	1.35999	0.180	0.256	661.
185	0.21124	68.28	0.082	32.254	45.137	1.36700	0.179	0.255	671.
190	0.20539	70.32	0.080	33.163	46.413	1.37381	0.179	0.255	681.
195	0.19987	72.36	0.078	34.070	47.686	1.38042	0.179	0.254	690.
200	0.19465	74.39	0.076	34.975	48.956	1.38685	0.179	0.254	699.
205	0.18970	76.41	0.074	35.879	50.224	1.39311	0.179	0.253	709.
210	0.18501	78.42	0.072	36.781	51.490	1.39922	0.179	0.253	718.
215	0.18055	80.43	0.070	37.682	52.755	1.40517	0.178	0.253	726.
220	0.17631	82.43	0.068	38.582	54.017	1.41097	0.178	0.252	735.
225	0.17227	84.43	0.067	39.481	55.278	1.41664	0.178	0.252	744.
230	0.16841	86.42	0.065	40.379	56.538	1.42218	0.178	0.252	752.
235	0.16473	88.41	0.064	41.277	57.797	1.42759	0.178	0.252	761.
240	0.16121	90.39	0.062	42.173	59.055	1.43289	0.178	0.251	769.
245	0.15783	92.37	0.061	43.070	60.311	1.43807	0.178	0.251	777.
250	0.15460	94.35	0.060	43.965	61.567	1.44314	0.178	0.251	785.
260	0.14853	98.29	0.057	45.754	64.076	1.45299	0.178	0.251	801.
270	0.14292	102.22	0.055	47.542	66.583	1.46245	0.178	0.251	817.
280	0.13773	106.14	0.053	49.328	69.087	1.47155	0.178	0.250	832.
290	0.13291	110.06	0.051	51.113	71.589	1.48033	0.178	0.250	847.
300	0.12841	113.97	0.049	52.896	74.089	1.48881	0.178	0.250	862.
320	0.12029	121.76	0.046	56.461	79.085	1.50493	0.178	0.250	891.
340	0.11314	129.54	0.044	60.022	84.076	1.52006	0.178	0.249	918.
360	0.10680	137.31	0.041	63.581	89.063	1.53431	0.177	0.249	945.
380	0.10114	145.06	0.039	67.139	94.047	1.54778	0.177	0.249	971.
400	0.09605	152.79	0.037	70.694	99.029	1.56056	0.177	0.249	997.
420	0.09145	160.52	0.035	74.249	104.008	1.57271	0.177	0.249	1022.
440	0.08727	168.25	0.034	77.802	108.986	1.58429	0.177	0.249	1046.
460	0.08346	175.97	0.032	81.355	113.963	1.59535	0.177	0.249	1069.
480	0.07997	183.68	0.031	84.908	118.939	1.60594	0.177	0.249	1092.
500	0.07676	191.38	0.029	88.460	123.914	1.61609	0.177	0.249	1115.
520	0.07380	199.09	0.028	92.011	128.888	1.62585	0.177	0.249	1137.
540	0.07106	206.78	0.027	95.563	133.862	1.63523	0.177	0.249	1159.
560	0.06851	214.48	0.026	99.116	138.837	1.64428	0.177	0.249	1180.
580	0.06615	222.17	0.025	102.669	143.812	1.65301	0.178	0.249	1201.
600	0.06394	229.86	0.025	106.223	148.787	1.66144	0.178	0.249	1221.
650	0.05901	249.08	0.023	115.115	161.232	1.68136	0.178	0.249	1271.
700	0.05479	268.29	0.021	124.021	173.690	1.69983	0.178	0.249	1319.
750	0.05114	287.49	0.020	132.949	186.168	1.71705	0.179	0.250	1364.
800	0.04794	306.68	0.018	141.906	198.675	1.73319	0.179	0.250	1408.
850	0.04512	325.86	0.017	150.899	211.218	1.74840	0.180	0.251	1451.
900	0.04261	345.05	0.016	159.935	223.805	1.76278	0.181	0.252	1492.
950	0.04037	364.22	0.015	169.023	236.442	1.77645	0.182	0.253	1531.
1000	0.03835	383.40	0.015	178.169	249.136	1.78947	0.183	0.254	1570.
1100	0.03486	421.74	0.013	196.653	274.717	1.81385	0.186	0.257	1643.
1200	0.03196	460.08	0.012	215.424	300.585	1.83636	0.189	0.260	1712.
1300	0.02950	498.41	0.011	234.503	326.759	1.85731	0.192	0.263	1778.
1400	0.02739	536.73	0.010	253.899	353.250	1.87694	0.196	0.267	1841.
1500	0.02557	575.05	0.010	273.612	380.058	1.89543	0.199	0.270	1902.
2000	0.01918	766.63	0.007	376.583	518.501	1.97499	0.213	0.293	2177.
2500	0.01534	958.19	0.006	485.481	662.869	2.07938	0.222	0.293	2420.
3000	0.01278	1149.73	0.005	598.516	811.374	2.09351	0.229	0.300	2641.
3500	0.01096	1341.27	0.004	714.412	962.738	2.14017	0.234	0.305	2846.

* INDICATES TWO PHASE BOUNDARY.

THERMODYNAMIC PROPERTIES OF NITROGEN

15 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.708	54.17515	1993.77	257.3	-64.682	-64.631	0.58028	0.228	0.467	4345.
115	54.00739	1912.72	249.9	-64.077	-64.026	0.58557	0.232	0.471	4239.
120	53.33834	1640.79	224.7	-61.695	-61.643	0.60585	0.241	0.431	3897.
125	52.63794	1422.28	203.6	-59.273	-59.220	0.62563	0.243	0.437	3631.
130	51.90682	1243.63	185.6	-56.831	-56.777	0.64480	0.242	0.450	3412.
135	51.14583	1094.77	169.8	-54.377	-54.323	0.66332	0.240	0.452	3224.
*139.538	50.42985	979.13	157.1	-52.143	-52.088	0.67960	0.237	0.453	3071.
*139.538	0.29344	48.78	0.117	23.809	33.275	1.29192	0.184	0.269	574.
140	0.29233	48.99	0.117	23.897	33.399	1.29281	0.184	0.268	575.
145	0.28095	51.23	0.112	24.848	34.735	1.30218	0.183	0.256	587.
150	0.27051	53.44	0.107	25.790	36.058	1.31116	0.182	0.264	598.
155	0.26089	55.62	0.103	26.726	37.372	1.31977	0.182	0.262	609.
160	0.25199	57.77	0.099	27.655	38.678	1.32807	0.181	0.260	620.
165	0.24372	59.89	0.096	28.580	39.977	1.33606	0.181	0.259	631.
170	0.23601	62.00	0.092	29.501	41.271	1.34378	0.180	0.258	641.
175	0.22890	64.09	0.089	30.418	42.559	1.35125	0.180	0.257	651.
180	0.22204	66.16	0.087	31.333	43.842	1.35848	0.180	0.256	661.
185	0.21569	68.22	0.084	32.244	45.122	1.36550	0.179	0.256	671.
190	0.20971	70.27	0.082	33.154	46.399	1.37230	0.179	0.255	681.
195	0.20407	72.31	0.079	34.061	47.672	1.37892	0.179	0.254	690.
200	0.19874	74.34	0.077	34.967	48.943	1.38536	0.179	0.254	699.
205	0.19368	76.37	0.075	35.871	50.212	1.39162	0.179	0.254	709.
210	0.18889	78.38	0.073	36.773	51.479	1.39773	0.179	0.253	718.
215	0.18433	80.39	0.071	37.675	52.743	1.40368	0.178	0.253	726.
220	0.18000	82.39	0.070	38.575	54.007	1.40949	0.178	0.252	735.
225	0.17587	84.39	0.068	39.474	55.268	1.41516	0.178	0.252	744.
230	0.17193	86.39	0.066	40.373	56.529	1.42070	0.178	0.252	752.
235	0.16817	88.37	0.065	41.271	57.788	1.42611	0.178	0.252	761.
240	0.16457	90.36	0.064	42.167	59.046	1.43141	0.178	0.251	769.
245	0.16113	92.34	0.062	43.064	60.303	1.43659	0.178	0.251	777.
250	0.15783	94.32	0.061	43.959	61.559	1.44167	0.178	0.251	785.
260	0.15162	98.26	0.059	45.749	64.069	1.45151	0.178	0.251	801.
270	0.14590	102.20	0.056	47.537	66.575	1.46097	0.178	0.251	817.
280	0.14060	106.12	0.054	49.323	69.080	1.47008	0.178	0.250	832.
290	0.13567	110.04	0.052	51.108	71.582	1.47886	0.178	0.250	847.
300	0.13108	113.95	0.050	52.892	74.083	1.48734	0.178	0.250	862.
320	0.12279	121.75	0.047	56.457	79.079	1.50346	0.178	0.250	891.
340	0.11549	129.53	0.044	60.019	84.071	1.51859	0.178	0.249	918.
360	0.10901	137.29	0.042	63.578	89.058	1.53285	0.177	0.249	945.
380	0.10323	145.04	0.040	67.136	94.043	1.54632	0.177	0.249	971.
400	0.09804	152.79	0.038	70.691	99.025	1.55910	0.177	0.249	997.
420	0.09334	160.52	0.036	74.246	104.005	1.57125	0.177	0.249	1022.
440	0.08908	168.24	0.034	77.800	108.983	1.58283	0.177	0.249	1046.
460	0.08519	175.96	0.033	81.353	113.960	1.59389	0.177	0.249	1069.
480	0.08162	183.67	0.031	84.905	118.936	1.60448	0.177	0.249	1092.
500	0.07835	191.38	0.030	88.457	123.911	1.61463	0.177	0.249	1115.
520	0.07532	199.08	0.029	92.010	128.886	1.62439	0.177	0.249	1137.
540	0.07253	206.78	0.028	95.562	133.860	1.63378	0.177	0.249	1159.
560	0.06993	214.48	0.027	99.114	138.835	1.64282	0.177	0.249	1180.
580	0.06751	222.17	0.026	102.667	143.810	1.65155	0.178	0.249	1201.
600	0.06526	229.86	0.025	106.222	148.786	1.65999	0.178	0.249	1221.
650	0.06023	249.08	0.023	115.114	161.230	1.67991	0.178	0.249	1271.
700	0.05592	268.29	0.021	124.020	173.689	1.69837	0.178	0.249	1319.
750	0.05219	287.49	0.020	132.949	186.168	1.71559	0.179	0.250	1364.
800	0.04893	306.68	0.019	141.905	198.675	1.73174	0.179	0.250	1408.
850	0.04605	325.87	0.018	150.898	211.218	1.74694	0.180	0.251	1451.
900	0.04349	345.05	0.017	159.935	223.804	1.76133	0.181	0.252	1492.
950	0.04120	364.23	0.016	169.023	236.441	1.77500	0.182	0.253	1531.
1000	0.03914	383.41	0.015	178.168	249.136	1.78802	0.183	0.254	1570.
1100	0.03558	421.75	0.014	196.653	274.717	1.81240	0.186	0.257	1643.
1200	0.03262	460.09	0.013	215.424	300.585	1.83490	0.189	0.260	1712.
1300	0.03011	498.42	0.012	234.502	326.759	1.85585	0.192	0.263	1778.
1400	0.02796	536.74	0.011	253.898	353.250	1.87548	0.196	0.267	1841.
1500	0.02609	575.06	0.010	273.612	380.059	1.89398	0.199	0.270	1902.
2000	0.01957	766.64	0.008	376.582	518.502	1.97354	0.213	0.283	2177.
2500	0.01566	958.20	0.006	485.481	662.870	2.03793	0.222	0.293	2420.
3000	0.01305	1149.74	0.005	598.516	811.375	2.09206	0.229	0.300	2641.
3500	0.01119	1341.28	0.004	714.412	962.739	2.13872	0.234	0.305	2846.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

20 PSIA ISOBAK

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.722	54.17589	1993.85	257.2	-64.681	-64.612	0.58029	0.228	0.466	4344.
115	54.01001	1913.68	249.9	-64.082	-64.014	0.58553	0.232	0.471	4238.
120	53.34138	1641.72	224.7	-61.700	-61.631	0.60581	0.241	0.481	3896.
125	52.64146	1423.19	203.6	-59.279	-59.209	0.62558	0.244	0.487	3631.
130	51.91083	1244.84	185.6	-56.837	-56.766	0.64475	0.243	0.490	3412.
135	51.15040	1095.67	169.8	-54.385	-54.312	0.66327	0.240	0.492	3224.
140	50.36076	969.12	155.9	-51.924	-51.850	0.68118	0.237	0.493	3057.
*144.108	49.69015	877.93	145.5	-49.895	-49.820	0.69546	0.235	0.495	2930.
*144.108	0.38278	49.29	0.154	24.401	34.076	1.27815	0.186	0.273	580.
145	0.38001	49.71	0.153	24.574	34.320	1.27984	0.185	0.273	582.
150	0.36532	52.03	0.146	25.538	35.676	1.23903	0.184	0.270	594.
155	0.35186	54.31	0.140	26.492	37.017	1.29783	0.183	0.267	606.
160	0.33947	56.54	0.135	27.438	38.348	1.30628	0.183	0.265	617.
165	0.32800	58.75	0.130	28.377	39.668	1.31440	0.182	0.263	628.
170	0.31736	60.92	0.125	29.311	40.981	1.32224	0.181	0.262	638.
175	0.30744	63.08	0.121	30.239	42.286	1.32981	0.181	0.260	649.
180	0.29816	65.21	0.117	31.164	43.585	1.33713	0.181	0.259	659.
185	0.28947	67.32	0.113	32.084	44.879	1.34422	0.180	0.258	669.
190	0.28130	69.42	0.110	33.002	46.168	1.35109	0.180	0.257	678.
195	0.27360	71.50	0.107	33.917	47.453	1.35777	0.180	0.257	688.
200	0.26634	73.58	0.104	34.829	48.734	1.36426	0.179	0.256	697.
205	0.25947	75.64	0.101	35.739	50.013	1.37057	0.179	0.255	707.
210	0.25296	77.69	0.098	36.648	51.288	1.37672	0.179	0.255	716.
215	0.24679	79.73	0.096	37.554	52.561	1.38271	0.179	0.254	725.
220	0.24092	81.76	0.094	38.459	53.832	1.38855	0.179	0.254	734.
225	0.23533	83.79	0.091	39.363	55.101	1.39425	0.179	0.254	742.
230	0.23000	85.81	0.089	40.266	56.368	1.39982	0.178	0.253	751.
235	0.22492	87.82	0.087	41.167	57.633	1.40527	0.178	0.253	760.
240	0.22007	89.83	0.085	42.068	58.897	1.41059	0.178	0.253	768.
245	0.21542	91.83	0.083	42.967	60.159	1.41579	0.178	0.252	776.
250	0.21098	93.83	0.082	43.866	61.421	1.42089	0.178	0.252	784.
260	0.20262	97.81	0.078	45.662	63.940	1.43077	0.178	0.252	800.
270	0.19492	101.78	0.075	47.455	66.455	1.44026	0.178	0.251	816.
280	0.18780	105.74	0.073	49.245	68.967	1.44940	0.178	0.251	832.
290	0.18118	109.69	0.070	51.035	71.476	1.45820	0.178	0.251	847.
300	0.17502	113.62	0.068	52.822	73.982	1.46670	0.178	0.251	861.
320	0.16390	121.47	0.063	56.393	78.990	1.48286	0.178	0.250	890.
340	0.15412	129.29	0.059	59.960	83.990	1.49802	0.178	0.250	918.
360	0.14546	137.09	0.056	63.524	88.986	1.51229	0.178	0.250	945.
380	0.13772	144.87	0.053	67.086	93.977	1.52579	0.177	0.249	971.
400	0.13078	152.64	0.050	70.645	98.965	1.53858	0.177	0.249	997.
420	0.12450	160.39	0.048	74.203	103.950	1.55074	0.177	0.249	1022.
440	0.11880	168.14	0.046	77.759	108.933	1.56233	0.177	0.249	1046.
460	0.11361	175.88	0.044	81.315	113.914	1.57340	0.177	0.249	1069.
480	0.10885	183.61	0.042	84.869	118.894	1.58400	0.177	0.249	1093.
500	0.10448	191.33	0.040	88.423	123.873	1.59416	0.177	0.249	1115.
520	0.10044	199.05	0.039	91.977	128.850	1.60392	0.177	0.249	1137.
540	0.09671	206.76	0.037	95.531	133.827	1.61331	0.177	0.249	1159.
560	0.09324	214.47	0.036	99.085	138.805	1.62236	0.178	0.249	1180.
580	0.09002	222.17	0.035	102.640	143.782	1.63110	0.178	0.249	1201.
600	0.08701	229.87	0.033	106.195	148.760	1.63953	0.178	0.249	1222.
650	0.08030	249.11	0.031	115.090	161.209	1.65946	0.178	0.249	1271.
700	0.07456	268.34	0.029	123.999	173.672	1.67794	0.178	0.249	1319.
750	0.06958	287.55	0.027	132.929	186.154	1.69516	0.179	0.250	1365.
800	0.06523	306.76	0.025	141.887	198.664	1.71131	0.179	0.251	1409.
850	0.06139	325.96	0.024	150.881	211.209	1.72652	0.180	0.251	1451.
900	0.05798	345.15	0.022	159.920	223.798	1.74091	0.181	0.252	1492.
950	0.05493	364.33	0.021	169.009	236.437	1.75457	0.182	0.253	1532.
1000	0.05218	383.52	0.020	178.155	249.133	1.76760	0.183	0.255	1570.
1100	0.04744	421.87	0.018	196.642	274.718	1.79198	0.186	0.257	1643.
1200	0.04348	460.22	0.017	215.414	300.588	1.81449	0.189	0.260	1712.
1300	0.04014	498.56	0.015	234.494	326.764	1.83544	0.192	0.263	1778.
1400	0.03727	536.89	0.014	253.891	353.257	1.85507	0.196	0.267	1841.
1500	0.03479	575.22	0.013	273.605	380.067	1.87357	0.199	0.270	1902.
2000	0.02609	766.81	0.010	376.579	518.514	1.95313	0.213	0.293	2177.
2500	0.02088	958.37	0.008	485.479	662.885	2.01752	0.222	0.293	2420.
3000	0.01740	1149.92	0.007	598.515	811.390	2.07165	0.229	0.300	2641.
3500	0.01491	1341.46	0.006	714.412	962.755	2.11831	0.234	0.305	2846.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

25 PSIA ISORAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.736	54.17664	1293.93	257.1	-64.679	-64.594	0.58031	0.229	0.466	4342.
115	54.01262	1214.64	249.9	-64.087	-64.001	0.58549	0.232	0.470	4237.
120	53.34443	1642.66	224.7	-61.706	-61.619	0.60577	0.241	0.431	3896.
125	52.64497	1424.11	203.6	-59.285	-59.197	0.62554	0.244	0.437	3631.
130	51.91485	1245.44	185.6	-56.844	-56.755	0.64469	0.243	0.440	3413.
135	51.15426	1096.57	169.9	-54.392	-54.302	0.66321	0.240	0.442	3225.
140	50.36592	970.03	155.9	-51.932	-51.840	0.68112	0.237	0.443	3057.
145	49.54766	860.30	143.3	-49.463	-49.369	0.69846	0.234	0.445	2904.
*147.880	49.06279	803.13	136.7	-48.035	-47.940	0.70821	0.232	0.447	2821.
*147.880	0.47078	49.56	0.191	24.860	34.694	1.26747	0.187	0.278	584.
150	0.46277	50.59	0.187	25.277	35.281	1.27141	0.186	0.276	590.
155	0.44508	52.97	0.179	26.252	36.653	1.28041	0.185	0.273	602.
160	0.42888	55.30	0.172	27.215	38.010	1.28902	0.184	0.270	613.
165	0.41396	57.59	0.165	28.170	39.353	1.29729	0.183	0.268	624.
170	0.40017	59.84	0.159	29.117	40.685	1.30525	0.182	0.266	635.
175	0.38735	62.05	0.153	30.057	42.009	1.31292	0.182	0.264	646.
180	0.37541	64.25	0.148	30.992	43.324	1.32033	0.181	0.262	656.
185	0.36424	66.41	0.144	31.922	44.632	1.32750	0.181	0.261	666.
190	0.35377	68.56	0.139	32.848	45.934	1.33444	0.181	0.260	676.
195	0.34393	70.69	0.135	33.771	47.231	1.34118	0.180	0.259	686.
200	0.33466	72.80	0.131	34.690	48.523	1.34773	0.180	0.258	696.
205	0.32590	74.90	0.128	35.607	49.812	1.35409	0.180	0.257	705.
210	0.31761	76.99	0.124	36.521	51.096	1.36028	0.179	0.257	714.
215	0.30976	79.06	0.121	37.433	52.378	1.36631	0.179	0.256	723.
220	0.30231	81.13	0.118	38.343	53.657	1.37219	0.179	0.255	732.
225	0.29522	83.18	0.115	39.251	54.933	1.37792	0.179	0.255	741.
230	0.28847	85.23	0.112	40.158	56.206	1.38352	0.179	0.255	750.
235	0.28204	87.27	0.110	41.063	57.478	1.38899	0.179	0.254	758.
240	0.27589	89.30	0.107	41.968	58.748	1.39434	0.179	0.254	767.
245	0.27002	91.33	0.105	42.871	60.015	1.39957	0.178	0.253	775.
250	0.26440	93.34	0.103	43.773	61.282	1.40468	0.178	0.253	783.
260	0.25386	97.37	0.098	45.574	63.810	1.41460	0.178	0.253	800.
270	0.24415	101.37	0.095	47.372	66.334	1.42413	0.178	0.252	815.
280	0.23517	105.36	0.091	49.167	68.853	1.43329	0.178	0.252	831.
290	0.22684	109.34	0.088	50.961	71.369	1.44212	0.178	0.251	846.
300	0.21909	113.30	0.085	52.752	73.882	1.45064	0.178	0.251	861.
320	0.20511	121.19	0.079	56.330	78.900	1.46683	0.178	0.251	890.
340	0.19293	129.05	0.074	59.902	83.910	1.48202	0.178	0.250	918.
360	0.18196	136.89	0.070	63.471	88.913	1.49631	0.178	0.250	945.
380	0.17226	144.70	0.066	67.036	93.911	1.50993	0.178	0.250	971.
400	0.16355	152.49	0.063	70.599	98.905	1.52263	0.178	0.250	997.
420	0.15569	160.27	0.060	74.160	103.896	1.53481	0.177	0.249	1022.
440	0.14855	168.04	0.057	77.719	108.883	1.54641	0.177	0.249	1046.
460	0.14204	175.79	0.055	81.277	113.868	1.55749	0.177	0.249	1070.
480	0.13609	183.54	0.052	84.833	118.852	1.56809	0.177	0.249	1093.
500	0.13061	191.28	0.050	88.389	123.834	1.57826	0.177	0.249	1115.
520	0.12556	199.01	0.048	91.945	128.814	1.58803	0.177	0.249	1137.
540	0.12099	206.73	0.046	95.500	133.795	1.59743	0.177	0.249	1159.
560	0.11656	214.45	0.045	99.056	138.774	1.60648	0.178	0.249	1180.
580	0.11252	222.17	0.043	102.612	143.754	1.61522	0.178	0.249	1201.
600	0.10876	229.88	0.042	106.168	148.734	1.62366	0.178	0.249	1222.
650	0.10037	249.14	0.039	115.066	161.188	1.64360	0.178	0.249	1272.
700	0.09319	268.39	0.036	123.977	173.655	1.66208	0.178	0.249	1319.
750	0.08697	287.62	0.033	132.909	186.140	1.67930	0.179	0.250	1365.
800	0.08153	306.83	0.031	141.869	198.653	1.69545	0.179	0.251	1409.
850	0.07673	326.04	0.029	150.865	211.201	1.71067	0.180	0.251	1451.
900	0.07246	345.24	0.028	159.905	223.792	1.72506	0.181	0.252	1492.
950	0.06865	364.44	0.026	168.995	236.433	1.73873	0.182	0.253	1532.
1000	0.06521	383.63	0.025	178.143	249.131	1.75176	0.183	0.255	1570.
1100	0.05929	422.00	0.023	196.631	274.718	1.77614	0.186	0.257	1643.
1200	0.05435	460.35	0.021	215.405	300.590	1.79865	0.189	0.260	1713.
1300	0.05017	498.70	0.019	234.486	326.769	1.81960	0.192	0.263	1779.
1400	0.04658	537.04	0.018	253.884	353.263	1.83924	0.196	0.267	1842.
1500	0.04348	575.37	0.017	273.599	380.074	1.85773	0.199	0.270	1902.
2000	0.03261	766.9	0.013	376.575	518.526	1.93730	0.213	0.283	2177.
2500	0.02609	958.55	0.010	485.477	662.899	2.00169	0.222	0.293	2420.
3000	0.02175	1150.10	0.008	598.514	811.406	2.05582	0.229	0.300	2641.
3500	0.01864	1341.64	0.007	714.412	962.772	2.10248	0.234	0.305	2846.

* INDICATES TWO PHASE BOUNDARY

30 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE	DENSITY	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	CV	CP	VELOCITY
DEG R	LB/ CU FT	DERIVATIVE CU FT-PSIA/LB	DERIVATIVE PSIA/R	ENERGY BTU/LB	BTU/LB	BTU/LB-R	BTU / LB - R		OF SOUND FT/SEC
*113.749	54.17739	1994.01	257.0	-64.677	-64.575	0.58033	0.229	0.466	4340.
115	54.01523	1915.59	249.8	-64.092	-63.989	0.58545	0.233	0.470	4237.
120	53.34747	1643.59	224.7	-61.711	-61.607	0.60572	0.241	0.481	3896.
125	52.64848	1425.03	203.6	-59.291	-59.186	0.62549	0.244	0.487	3631.
130	51.91886	1246.35	185.6	-56.851	-56.744	0.64464	0.243	0.490	3413.
135	51.15952	1097.48	169.9	-54.399	-54.291	0.66316	0.240	0.491	3225.
140	50.37107	970.93	155.9	-51.940	-51.830	0.68106	0.237	0.493	3058.
145	49.55347	861.22	143.4	-49.472	-49.360	0.69839	0.234	0.495	2905.
150	48.70568	764.32	132.0	-46.990	-46.876	0.71523	0.231	0.498	2761.
*151.121	48.51134	744.05	129.6	-46.432	-46.317	0.71894	0.231	0.499	2730.
*151.121	0.55797	49.67	0.228	25.233	35.191	1.25873	0.188	0.252	588.
155	0.54071	51.60	0.220	26.005	36.279	1.26583	0.187	0.279	597.
160	0.52035	54.03	0.210	26.987	37.663	1.27462	0.185	0.275	605.
165	0.50169	56.40	0.202	27.959	39.031	1.28304	0.184	0.272	621.
170	0.48451	58.73	0.194	28.919	40.385	1.29113	0.184	0.270	632.
175	0.46361	61.02	0.187	29.872	41.727	1.29891	0.183	0.267	643.
180	0.45383	63.27	0.180	30.818	43.059	1.30641	0.182	0.265	654.
185	0.44005	65.50	0.174	31.758	44.382	1.31366	0.182	0.264	664.
190	0.42716	67.69	0.169	32.692	45.698	1.32068	0.181	0.262	674.
195	0.41507	69.87	0.164	33.623	47.007	1.32748	0.181	0.261	684.
200	0.40370	72.02	0.159	34.549	48.310	1.33408	0.180	0.260	694.
205	0.39298	74.16	0.154	35.473	49.609	1.34049	0.180	0.259	703.
210	0.38286	76.29	0.150	36.393	50.903	1.34673	0.180	0.258	713.
215	0.37327	78.39	0.146	37.310	52.193	1.35280	0.180	0.258	722.
220	0.36418	80.49	0.143	38.225	53.480	1.35872	0.179	0.257	731.
225	0.35555	82.57	0.139	39.138	54.763	1.36449	0.179	0.256	740.
230	0.34734	84.65	0.136	40.050	56.044	1.37012	0.179	0.256	748.
235	0.33951	86.71	0.132	40.959	57.322	1.37561	0.179	0.255	757.
240	0.33205	88.77	0.129	41.867	58.597	1.38098	0.179	0.255	766.
245	0.32492	90.82	0.127	42.773	59.871	1.38624	0.179	0.255	774.
250	0.31811	92.86	0.124	43.679	61.142	1.39137	0.179	0.254	782.
260	0.30533	96.92	0.119	45.486	63.680	1.40133	0.178	0.253	799.
270	0.29357	100.96	0.114	47.289	66.213	1.41088	0.178	0.253	815.
280	0.28271	104.98	0.110	49.089	68.740	1.42008	0.178	0.252	830.
290	0.27264	108.98	0.106	50.887	71.262	1.42893	0.178	0.252	846.
300	0.26329	112.97	0.102	52.682	73.782	1.43747	0.178	0.252	860.
320	0.24641	120.91	0.095	56.266	78.810	1.45370	0.178	0.251	890.
340	0.23161	128.82	0.090	59.844	83.829	1.46891	0.178	0.251	918.
360	0.21851	136.68	0.084	63.417	88.841	1.48323	0.178	0.250	945.
380	0.20683	144.53	0.080	66.986	93.845	1.49676	0.178	0.250	971.
400	0.19635	152.35	0.076	70.553	98.845	1.50958	0.178	0.250	997.
420	0.18690	160.15	0.072	74.116	103.841	1.52177	0.178	0.250	1022.
440	0.17831	167.94	0.069	77.678	108.833	1.53338	0.177	0.250	1046.
460	0.17049	175.71	0.066	81.238	113.823	1.54447	0.177	0.249	1070.
480	0.16333	183.47	0.063	84.797	118.810	1.55509	0.177	0.249	1093.
500	0.15676	191.23	0.060	88.355	123.795	1.56526	0.177	0.249	1115.
520	0.15069	198.97	0.058	91.913	128.779	1.57503	0.177	0.249	1138.
540	0.14508	206.71	0.056	95.470	133.762	1.58444	0.178	0.249	1159.
560	0.13987	214.44	0.054	99.027	138.744	1.59350	0.178	0.249	1181.
580	0.13503	222.17	0.052	102.584	143.726	1.60224	0.178	0.249	1202.
600	0.13051	229.89	0.050	106.142	148.708	1.61068	0.178	0.249	1222.
650	0.12044	249.17	0.046	115.042	161.167	1.63063	0.178	0.249	1272.
700	0.11182	268.43	0.043	123.956	173.638	1.64911	0.178	0.250	1320.
750	0.10435	287.68	0.040	132.890	186.127	1.66634	0.179	0.250	1365.
800	0.09782	306.91	0.038	141.851	198.643	1.68250	0.179	0.251	1409.
850	0.09206	326.13	0.035	150.849	211.193	1.69772	0.180	0.251	1452.
900	0.08694	345.34	0.033	159.890	223.786	1.71211	0.181	0.252	1493.
950	0.08237	364.54	0.032	168.981	236.429	1.72578	0.182	0.253	1532.
1000	0.07825	383.74	0.030	178.130	249.128	1.73881	0.184	0.255	1571.
1100	0.07113	422.12	0.027	196.620	274.719	1.76320	0.186	0.257	1644.
1200	0.06521	460.49	0.025	215.395	300.533	1.78571	0.189	0.260	1713.
1300	0.06019	498.84	0.023	234.477	326.773	1.80666	0.192	0.263	1779.
1400	0.05589	537.18	0.021	253.876	353.269	1.82630	0.196	0.267	1842.
1500	0.05217	575.52	0.020	273.592	380.082	1.84480	0.199	0.270	1902.
2000	0.03913	767.15	0.015	376.572	518.538	1.92436	0.213	0.283	2177.
2500	0.03131	958.72	0.012	485.475	662.913	1.98876	0.222	0.293	2420.
3000	0.02609	1150.27	0.010	598.513	811.421	2.04289	0.229	0.300	2642.
3500	0.02237	1341.81	0.009	714.411	962.788	2.08955	0.234	0.305	2846.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

35 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*113.763	54.17814	1994.09	256.9	-64.676	-64.556	0.58034	0.229	0.466	4338.
115	54.01784	1916.55	249.8	-64.096	-63.976	0.58541	0.233	0.470	4236.
120	53.35051	1644.52	224.6	-61.716	-61.595	0.60568	0.242	0.481	3896.
125	52.65199	1425.95	203.6	-59.297	-59.174	0.62544	0.244	0.487	3631.
130	51.92287	1247.26	185.6	-56.857	-56.733	0.64459	0.243	0.490	3413.
135	51.16407	1098.38	169.9	-54.407	-54.280	0.66310	0.240	0.491	3225.
140	50.37622	971.84	155.9	-51.948	-51.820	0.68100	0.237	0.493	3058.
145	49.55927	862.13	143.4	-49.481	-49.350	0.69833	0.234	0.495	2905.
150	48.71222	765.25	132.0	-47.000	-46.867	0.71516	0.232	0.498	2762.
*153.980	48.01506	695.34	123.7	-45.013	-44.878	0.72925	0.230	0.502	2653.
*153.980	0.64435	49.66	0.265	25.543	35.602	1.25131	0.189	0.286	591.
155	0.63896	50.19	0.263	25.750	35.894	1.25319	0.189	0.285	593.
160	0.61402	52.73	0.251	26.753	37.308	1.26218	0.187	0.281	605.
165	0.59130	55.20	0.240	27.741	38.702	1.27075	0.186	0.277	617.
170	0.57047	57.60	0.230	28.717	40.078	1.27897	0.185	0.274	629.
175	0.55126	59.97	0.221	29.683	41.440	1.28687	0.184	0.271	640.
180	0.53348	62.28	0.213	30.640	42.739	1.29447	0.183	0.269	651.
185	0.51694	64.57	0.206	31.591	44.128	1.30181	0.182	0.267	661.
190	0.50151	66.82	0.199	32.535	45.458	1.30890	0.182	0.265	672.
195	0.48706	69.04	0.193	33.473	46.730	1.31577	0.181	0.264	682.
200	0.47350	71.24	0.187	34.407	48.095	1.32243	0.181	0.262	692.
205	0.46074	73.42	0.182	35.337	49.404	1.32889	0.181	0.261	701.
210	0.44371	75.58	0.177	36.264	50.708	1.33518	0.180	0.260	711.
215	0.43733	77.72	0.172	37.187	52.007	1.34129	0.180	0.259	720.
220	0.42655	79.85	0.168	38.107	53.302	1.34724	0.180	0.259	729.
225	0.41633	81.96	0.163	39.025	54.593	1.35304	0.180	0.258	738.
230	0.40661	84.06	0.159	39.940	55.880	1.35870	0.179	0.257	747.
235	0.39736	86.16	0.156	40.854	57.165	1.36423	0.179	0.257	756.
240	0.38855	88.24	0.152	41.766	58.446	1.36962	0.179	0.256	765.
245	0.38014	90.31	0.148	42.676	59.725	1.37490	0.179	0.256	773.
250	0.37210	92.37	0.145	43.584	61.002	1.38006	0.179	0.255	781.
260	0.35704	96.47	0.139	45.397	63.550	1.39005	0.179	0.254	798.
270	0.34320	100.55	0.134	47.206	66.091	1.39964	0.178	0.254	814.
280	0.33042	104.60	0.128	49.011	68.626	1.40886	0.178	0.253	830.
290	0.31860	108.63	0.124	50.812	71.155	1.41774	0.178	0.253	845.
300	0.30761	112.65	0.119	52.611	73.681	1.42630	0.178	0.252	860.
320	0.28791	120.64	0.112	56.202	78.721	1.44256	0.178	0.252	889.
340	0.27046	128.58	0.105	59.785	83.749	1.45780	0.178	0.251	917.
360	0.25512	136.48	0.099	63.363	88.768	1.47215	0.178	0.251	945.
380	0.24145	144.35	0.093	66.936	93.779	1.48570	0.178	0.250	971.
400	0.22919	152.20	0.089	70.506	98.785	1.49853	0.178	0.250	997.
420	0.21813	160.03	0.084	74.073	103.786	1.51073	0.178	0.250	1022.
440	0.20810	167.83	0.080	77.638	108.783	1.52236	0.178	0.250	1046.
460	0.19896	175.63	0.077	81.200	113.777	1.53346	0.178	0.250	1070.
480	0.19059	183.41	0.073	84.761	118.767	1.54408	0.177	0.249	1093.
500	0.18291	191.18	0.070	88.321	123.756	1.55426	0.177	0.249	1116.
520	0.17582	198.94	0.068	91.880	128.743	1.56404	0.178	0.249	1138.
540	0.16927	206.69	0.065	95.439	133.729	1.57345	0.178	0.249	1160.
560	0.16319	214.43	0.063	98.998	138.714	1.58251	0.178	0.249	1181.
580	0.15753	222.17	0.061	102.556	143.698	1.59126	0.178	0.249	1202.
600	0.15226	229.90	0.059	106.115	148.682	1.59970	0.178	0.249	1222.
650	0.14051	249.20	0.054	115.019	161.146	1.61966	0.178	0.249	1272.
700	0.13044	268.48	0.050	123.934	173.621	1.63815	0.178	0.250	1320.
750	0.12173	287.74	0.047	132.870	186.113	1.65538	0.179	0.250	1366.
800	0.11411	306.99	0.044	141.834	198.632	1.67154	0.179	0.251	1410.
850	0.10739	326.22	0.041	150.833	211.185	1.68676	0.180	0.251	1452.
900	0.10142	345.44	0.039	159.875	223.780	1.70116	0.181	0.252	1493.
950	0.09608	364.65	0.037	168.968	236.425	1.71483	0.182	0.253	1533.
1000	0.09127	383.85	0.035	178.117	249.126	1.72786	0.184	0.255	1571.
1100	0.08298	422.25	0.032	196.609	274.719	1.75225	0.186	0.257	1644.
1200	0.07606	460.62	0.029	215.386	300.596	1.77477	0.189	0.260	1713.
1300	0.07021	498.98	0.027	234.469	326.778	1.79572	0.192	0.263	1779.
1400	0.06520	537.33	0.025	253.869	353.276	1.81536	0.196	0.267	1842.
1500	0.06035	575.67	0.023	273.586	380.090	1.83386	0.199	0.270	1903.
2000	0.04565	767.32	0.018	376.568	518.550	1.91343	0.213	0.294	2178.
2500	0.03652	958.90	0.014	485.473	662.927	1.97782	0.222	0.293	2421.
3000	0.03044	1150.45	0.012	598.512	811.437	2.03195	0.229	0.300	2642.
3500	0.02609	1341.99	0.010	714.411	962.804	2.07861	0.234	0.305	2846.

* INDICATES TWO PHASE BOUNDARY

40 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.777	54.17889	1994.17	256.7	-64.674	-64.537	0.58036	0.229	0.466	4337.
115	54.02045	1917.50	249.8	-64.101	-63.964	0.58537	0.233	0.470	4236.
120	53.35355	1445.46	224.6	-61.722	-61.503	0.60563	0.242	0.451	3895.
125	52.65549	1426.86	203.6	-59.303	-59.162	0.62539	0.244	0.437	3631.
130	51.92688	1248.17	185.6	-56.864	-56.721	0.64454	0.243	0.439	3413.
135	51.16962	1099.28	169.9	-54.414	-54.269	0.66305	0.240	0.441	3226.
140	50.38136	972.74	156.0	-51.956	-51.809	0.68094	0.237	0.453	3059.
145	49.56507	863.04	143.4	-49.490	-49.340	0.69827	0.234	0.495	2906.
150	48.71875	766.17	132.1	-47.010	-46.858	0.71510	0.232	0.498	2763.
155	47.84025	679.24	121.7	-44.512	-44.358	0.73150	0.229	0.503	2627.
*156.550	47.56091	653.98	118.6	-43.733	-43.577	0.73651	0.229	0.504	2586.
*156.550	0.73041	49.57	0.303	25.807	35.948	1.24485	0.190	0.230	593.
160	0.71006	51.40	0.293	26.512	36.943	1.25114	0.189	0.237	601.
165	0.68291	53.96	0.280	27.518	38.365	1.25989	0.187	0.282	614.
170	0.65814	56.46	0.268	28.510	39.765	1.26825	0.186	0.278	626.
175	0.63539	59.90	0.257	29.490	41.148	1.27626	0.185	0.275	637.
180	0.61441	61.28	0.247	30.460	42.516	1.28397	0.184	0.272	648.
185	0.59495	63.63	0.239	31.421	43.871	1.29140	0.183	0.270	659.
190	0.57684	65.93	0.231	32.375	45.216	1.29857	0.183	0.268	669.
195	0.55993	68.21	0.223	33.322	46.551	1.30551	0.182	0.266	680.
200	0.54408	70.45	0.216	34.264	47.878	1.31223	0.182	0.265	690.
205	0.52919	72.67	0.210	35.201	49.198	1.31874	0.181	0.263	700.
210	0.51518	74.87	0.204	36.133	50.511	1.32507	0.181	0.262	709.
215	0.50194	77.05	0.198	37.062	51.819	1.33123	0.180	0.261	719.
220	0.48942	79.21	0.193	37.988	53.122	1.33722	0.180	0.260	728.
225	0.47756	81.35	0.188	38.911	54.421	1.34306	0.180	0.259	737.
230	0.46630	83.48	0.183	39.831	55.716	1.34875	0.180	0.259	746.
235	0.45555	85.60	0.179	40.748	57.007	1.35430	0.180	0.258	755.
240	0.44539	87.70	0.175	41.664	58.295	1.35973	0.179	0.257	763.
245	0.43566	89.80	0.171	42.577	59.580	1.36502	0.179	0.257	772.
250	0.42637	91.88	0.167	43.489	60.852	1.37021	0.179	0.256	781.
260	0.40899	96.02	0.160	45.309	63.419	1.38024	0.179	0.255	797.
270	0.39302	100.13	0.153	47.122	65.969	1.38986	0.179	0.255	813.
280	0.37831	104.22	0.147	48.932	68.512	1.39911	0.178	0.254	829.
290	0.36470	108.28	0.142	50.738	71.048	1.40801	0.178	0.253	844.
300	0.35206	112.33	0.137	52.540	73.580	1.41659	0.178	0.253	860.
320	0.32931	120.36	0.128	56.138	78.631	1.43289	0.178	0.252	889.
340	0.30939	128.34	0.120	59.727	83.668	1.44816	0.178	0.252	917.
360	0.29178	136.28	0.113	63.309	88.695	1.46253	0.178	0.251	944.
380	0.27411	144.18	0.107	66.887	93.714	1.47609	0.178	0.251	971.
400	0.26206	152.06	0.101	70.460	98.725	1.48895	0.178	0.250	997.
420	0.24938	159.91	0.096	74.030	103.731	1.50116	0.178	0.250	1022.
440	0.23790	167.73	0.092	77.597	108.733	1.51279	0.178	0.250	1046.
460	0.22743	175.55	0.088	81.162	113.731	1.52390	0.178	0.250	1070.
480	0.21786	183.34	0.084	84.725	118.725	1.53453	0.178	0.250	1093.
500	0.20906	191.13	0.081	88.287	123.717	1.54472	0.178	0.250	1116.
520	0.20096	198.90	0.077	91.848	128.707	1.55450	0.178	0.249	1138.
540	0.19346	206.66	0.075	95.408	133.696	1.56392	0.178	0.249	1160.
560	0.18651	214.42	0.072	98.968	138.683	1.57299	0.178	0.249	1181.
580	0.18004	222.17	0.069	102.528	143.670	1.58174	0.178	0.249	1202.
600	0.17401	229.91	0.067	106.089	148.657	1.59019	0.178	0.249	1223.
650	0.16057	249.23	0.062	114.995	161.125	1.61015	0.178	0.249	1272.
700	0.14907	268.53	0.057	123.913	173.604	1.62864	0.178	0.250	1320.
750	0.13910	287.81	0.053	132.851	186.100	1.64589	0.179	0.250	1366.
800	0.13040	307.06	0.050	141.816	198.621	1.66205	0.179	0.251	1410.
850	0.12272	326.30	0.047	150.817	211.177	1.67727	0.180	0.252	1452.
900	0.11589	345.53	0.045	159.860	223.774	1.69167	0.181	0.252	1493.
950	0.10979	364.75	0.042	168.954	236.421	1.70535	0.182	0.253	1533.
1000	0.10430	383.97	0.040	178.104	249.124	1.71838	0.184	0.255	1571.
1100	0.09482	422.37	0.036	196.598	274.720	1.74277	0.186	0.257	1644.
1200	0.08692	460.75	0.033	215.376	300.579	1.76529	0.189	0.260	1714.
1300	0.08023	499.12	0.031	234.461	326.783	1.78624	0.192	0.263	1779.
1400	0.07450	537.48	0.029	253.862	353.282	1.80588	0.196	0.267	1842.
1500	0.06954	575.83	0.027	273.580	380.097	1.82438	0.199	0.270	1903.
2000	0.05216	767.48	0.020	376.565	518.562	1.90395	0.213	0.284	2178.
2500	0.04174	959.07	0.016	485.471	662.941	1.96815	0.222	0.293	2421.
3000	0.03479	1150.63	0.013	598.512	811.452	2.02248	0.229	0.300	2642.
3500	0.02982	1342.17	0.011	714.411	962.821	2.06914	0.234	0.305	2847.

* INDICATES TWO PHASE BOUNDARY

45 PSIA ISODAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHEM DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*113.790	54.17965	1994.26	256.6	-64.672	-64.518	0.58037	0.229	0.466	4335.
115	54.02306	1918.46	249.7	-64.106	-63.952	0.58532	0.233	0.470	4235.
120	53.35659	1646.39	224.6	-61.727	-61.571	0.60559	0.242	0.481	3895.
125	52.65899	1427.78	203.6	-59.309	-59.151	0.62535	0.244	0.487	3631.
130	51.93049	1249.07	185.6	-56.871	-56.710	0.64449	0.243	0.489	3413.
135	51.17317	1100.19	169.9	-54.422	-54.259	0.66299	0.241	0.491	3226.
140	50.38650	973.65	156.0	-51.965	-51.799	0.68088	0.237	0.493	3059.
145	49.57086	863.96	143.5	-49.499	-49.331	0.69821	0.234	0.495	2907.
150	48.72527	767.10	132.1	-47.020	-46.849	0.71503	0.232	0.498	2764.
155	47.84760	680.19	121.7	-44.524	-44.349	0.73143	0.229	0.502	2628.
*158.892	47.14009	618.07	114.2	-42.562	-42.386	0.74394	0.228	0.507	2525.
*158.892	0.81620	49.43	0.341	26.033	36.243	1.23912	0.191	0.295	595.
160	0.80865	50.03	0.337	26.264	36.569	1.24116	0.190	0.293	597.
165	0.77666	52.71	0.321	27.290	38.020	1.25009	0.189	0.298	610.
170	0.74762	55.29	0.307	28.299	39.446	1.25861	0.187	0.293	622.
175	0.72108	57.81	0.294	29.294	40.850	1.26675	0.186	0.279	634.
180	0.69568	60.27	0.282	30.277	42.238	1.27457	0.185	0.276	645.
185	0.67412	62.68	0.272	31.249	43.610	1.28209	0.184	0.273	656.
190	0.65319	65.04	0.263	32.213	44.970	1.28934	0.183	0.271	667.
195	0.63369	67.36	0.254	33.169	46.319	1.29635	0.183	0.269	678.
200	0.61546	69.65	0.246	34.119	47.658	1.30313	0.182	0.267	688.
205	0.59836	71.92	0.238	35.063	48.989	1.30970	0.182	0.265	698.
210	0.58228	74.15	0.231	36.002	50.313	1.31608	0.181	0.264	707.
215	0.56713	76.37	0.225	36.937	51.630	1.32228	0.181	0.263	717.
220	0.55281	78.56	0.219	37.868	52.942	1.32831	0.181	0.262	726.
225	0.53926	80.73	0.213	38.795	54.248	1.33419	0.180	0.261	736.
230	0.52640	82.89	0.208	39.720	55.550	1.33991	0.180	0.260	745.
235	0.51419	85.04	0.203	40.642	56.848	1.34549	0.180	0.259	754.
240	0.50257	87.17	0.198	41.561	58.142	1.35094	0.180	0.258	762.
245	0.49150	89.28	0.193	42.479	59.433	1.35626	0.179	0.258	771.
250	0.48093	91.39	0.189	43.394	60.721	1.36147	0.179	0.257	780.
260	0.46118	95.57	0.181	45.219	63.288	1.37154	0.179	0.256	796.
270	0.44306	99.72	0.173	47.039	65.847	1.38119	0.179	0.255	812.
280	0.42537	103.84	0.166	48.853	68.397	1.39047	0.179	0.255	828.
290	0.41095	107.93	0.160	50.663	70.941	1.39939	0.178	0.254	844.
300	0.39664	112.00	0.154	52.470	73.479	1.40800	0.178	0.254	859.
320	0.37090	120.08	0.144	56.074	78.541	1.42433	0.178	0.253	888.
340	0.34838	128.11	0.135	59.668	83.588	1.43963	0.178	0.252	917.
360	0.32850	136.08	0.127	63.255	88.622	1.45402	0.178	0.251	944.
380	0.31081	144.01	0.120	66.837	93.648	1.46761	0.178	0.251	971.
400	0.29495	151.91	0.114	70.413	98.655	1.48048	0.178	0.251	997.
420	0.28067	159.78	0.109	73.986	103.677	1.49270	0.178	0.250	1022.
440	0.26771	167.63	0.103	77.556	108.683	1.50434	0.178	0.250	1046.
460	0.25592	175.46	0.099	81.124	113.685	1.51546	0.178	0.250	1070.
480	0.24513	183.28	0.095	84.689	118.683	1.52610	0.178	0.250	1093.
500	0.23523	191.08	0.091	88.253	123.679	1.53629	0.178	0.250	1116.
520	0.22610	198.87	0.087	91.816	128.672	1.54609	0.178	0.250	1138.
540	0.21766	206.64	0.084	95.378	133.663	1.55551	0.178	0.250	1160.
560	0.20993	214.41	0.081	98.939	138.653	1.56458	0.178	0.249	1181.
580	0.20255	222.17	0.078	102.501	143.642	1.57333	0.178	0.249	1202.
600	0.19576	229.92	0.075	106.062	148.631	1.58179	0.178	0.249	1223.
650	0.18063	249.26	0.070	114.971	161.104	1.60176	0.178	0.250	1273.
700	0.16768	268.58	0.065	123.892	173.587	1.62026	0.178	0.250	1320.
750	0.15648	287.87	0.060	132.831	186.036	1.63750	0.179	0.250	1366.
800	0.14668	307.14	0.056	141.798	198.610	1.65367	0.179	0.251	1410.
850	0.13804	326.39	0.053	150.800	211.169	1.66890	0.180	0.252	1453.
900	0.13036	345.63	0.050	159.845	223.768	1.68330	0.181	0.252	1494.
950	0.12349	364.86	0.047	168.940	236.417	1.69699	0.182	0.254	1533.
1000	0.11732	384.08	0.045	178.092	249.121	1.71001	0.184	0.255	1571.
1100	0.10665	422.49	0.041	196.587	274.721	1.73441	0.186	0.257	1645.
1200	0.09777	460.89	0.038	215.367	300.602	1.75692	0.189	0.260	1714.
1300	0.09025	499.26	0.035	234.453	326.788	1.77788	0.192	0.263	1780.
1400	0.08380	537.63	0.032	253.855	353.298	1.79752	0.196	0.267	1842.
1500	0.07822	575.98	0.030	273.573	380.105	1.81602	0.199	0.270	1903.
2000	0.05868	767.65	0.023	376.561	518.574	1.89560	0.213	0.284	2178.
2500	0.04695	959.24	0.018	485.469	662.956	1.95999	0.222	0.293	2421.
3000	0.03913	1150.80	0.015	598.511	811.468	2.01413	0.229	0.300	2642.
3500	0.03354	1342.35	0.013	714.411	962.837	2.06078	0.234	0.305	2847.

* INDICATES TWO PHASE BOUNDARY

50 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.804	54.18040	1994.34	256.5	-64.670	-64.499	0.58039	0.230	0.466	4333.
115	54.02566	1919.41	249.7	-64.111	-63.939	0.58528	0.233	0.470	4235.
120	53.35962	1647.33	224.6	-61.732	-61.559	0.60554	0.242	0.481	3895.
125	52.66249	1428.70	203.6	-59.315	-59.139	0.62530	0.244	0.486	3631.
130	51.93489	1249.98	185.6	-56.877	-56.699	0.64444	0.243	0.489	3413.
135	51.17771	1101.09	169.9	-54.429	-54.249	0.66274	0.241	0.491	3226.
140	50.39163	974.55	156.0	-51.973	-51.789	0.68082	0.238	0.493	3060.
145	49.57664	864.87	143.5	-49.508	-49.321	0.69814	0.235	0.495	2907.
150	48.73179	768.02	132.2	-47.030	-46.840	0.71496	0.232	0.498	2765.
155	47.85495	681.13	121.8	-44.535	-44.341	0.73135	0.229	0.502	2629.
160	46.94272	602.10	112.2	-42.013	-41.816	0.74739	0.227	0.508	2497.
*161.049	46.74637	586.37	110.2	-41.480	-41.232	0.75072	0.227	0.510	2470.
*161.049	0.90184	49.23	0.379	26.230	36.497	1.23396	0.192	0.239	596.
165	0.87270	51.42	0.364	27.056	37.666	1.24113	0.190	0.253	606.
170	0.83903	54.11	0.347	28.084	39.119	1.24981	0.188	0.288	619.
175	0.80940	56.71	0.332	29.094	40.547	1.25809	0.187	0.233	631.
180	0.78035	59.24	0.319	30.090	41.955	1.26602	0.186	0.230	643.
185	0.75452	61.71	0.306	31.074	43.345	1.27364	0.185	0.277	654.
190	0.73061	64.13	0.295	32.048	44.721	1.28098	0.184	0.274	665.
195	0.70839	66.51	0.285	33.014	46.084	1.28806	0.183	0.271	675.
200	0.68766	68.85	0.276	33.972	47.436	1.29491	0.183	0.269	686.
205	0.66825	71.16	0.267	34.923	48.779	1.30154	0.182	0.268	696.
210	0.65004	73.43	0.259	35.869	50.113	1.30797	0.182	0.256	706.
215	0.63289	75.68	0.252	36.810	51.440	1.31421	0.181	0.255	715.
220	0.61672	77.91	0.245	37.747	52.760	1.32028	0.181	0.253	725.
225	0.60143	80.12	0.238	38.679	54.074	1.32619	0.181	0.262	734.
230	0.58694	82.30	0.232	39.609	55.384	1.33195	0.180	0.261	743.
235	0.57319	84.47	0.226	40.535	56.688	1.33756	0.180	0.261	752.
240	0.56011	86.63	0.221	41.458	57.989	1.34303	0.180	0.260	761.
245	0.54766	88.77	0.216	42.379	59.286	1.34838	0.180	0.259	770.
250	0.53579	90.90	0.211	43.298	60.579	1.35361	0.179	0.258	779.
260	0.51362	95.12	0.202	45.130	63.157	1.36372	0.179	0.257	795.
270	0.49331	99.31	0.193	46.955	65.724	1.37341	0.179	0.256	812.
280	0.47461	103.46	0.186	48.774	68.292	1.38271	0.179	0.255	828.
290	0.45735	107.58	0.179	50.588	70.833	1.39166	0.179	0.255	843.
300	0.44134	111.68	0.172	52.399	73.378	1.40029	0.178	0.254	859.
320	0.41258	119.81	0.161	56.009	78.451	1.41666	0.178	0.253	889.
340	0.38745	127.87	0.151	59.609	83.507	1.43199	0.178	0.252	917.
360	0.36527	135.88	0.142	63.201	88.550	1.44640	0.178	0.252	944.
380	0.34555	143.84	0.134	66.787	93.582	1.46000	0.178	0.251	971.
400	0.32788	151.77	0.127	70.367	98.605	1.47289	0.178	0.251	997.
420	0.31197	159.66	0.121	73.943	103.622	1.48512	0.178	0.251	1022.
440	0.29755	167.53	0.115	77.516	108.633	1.49678	0.178	0.250	1046.
460	0.28442	175.38	0.110	81.086	113.639	1.50791	0.178	0.250	1070.
480	0.27242	183.21	0.105	84.653	118.641	1.51855	0.178	0.250	1093.
500	0.26140	191.03	0.101	88.219	123.640	1.52875	0.178	0.250	1116.
520	0.25124	198.83	0.097	91.784	128.636	1.53855	0.178	0.250	1138.
540	0.24185	206.62	0.093	95.347	133.630	1.54797	0.178	0.250	1160.
560	0.23315	214.40	0.090	98.910	138.623	1.55705	0.178	0.250	1181.
580	0.22505	222.17	0.087	102.473	143.614	1.56591	0.178	0.250	1202.
600	0.21750	229.93	0.084	106.036	148.605	1.57427	0.178	0.250	1223.
650	0.20069	249.30	0.077	114.947	161.084	1.59425	0.178	0.250	1273.
700	0.18630	268.63	0.072	123.870	173.570	1.61275	0.178	0.250	1321.
750	0.17384	287.93	0.067	132.812	186.072	1.63001	0.179	0.250	1366.
800	0.16295	307.21	0.063	141.781	198.600	1.64617	0.179	0.251	1410.
850	0.15335	326.48	0.059	150.784	211.160	1.66140	0.180	0.252	1453.
900	0.14482	345.73	0.056	159.830	223.762	1.67581	0.181	0.253	1494.
950	0.13720	364.96	0.053	168.926	236.413	1.68949	0.182	0.254	1533.
1000	0.13033	384.19	0.050	178.079	249.119	1.70252	0.184	0.255	1572.
1100	0.11848	422.52	0.046	196.576	274.721	1.72672	0.186	0.257	1645.
1200	0.10861	461.02	0.042	215.357	300.605	1.74944	0.189	0.260	1714.
1300	0.10026	499.41	0.038	234.444	326.792	1.77040	0.192	0.263	1780.
1400	0.09310	537.77	0.036	253.847	353.295	1.79004	0.196	0.267	1843.
1500	0.08690	576.13	0.033	273.567	380.113	1.80854	0.199	0.270	1904.
2000	0.06519	767.82	0.025	376.558	518.596	1.88812	0.213	0.284	2178.
2500	0.05216	959.42	0.020	485.467	662.970	1.95252	0.222	0.293	2421.
3000	0.04347	1150.98	0.017	598.510	811.443	2.00665	0.229	0.300	2642.
3500	0.03727	1342.52	0.014	714.411	962.853	2.05331	0.234	0.305	2847.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

60 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*113.831	54.18191	1994.51	256.3	-64.667	-64.462	0.58042	0.230	0.466	4330.
115	54.03087	1921.33	249.6	-64.120	-63.914	0.58520	0.233	0.470	4234.
120	53.36569	1649.19	226.5	-61.743	-61.535	0.60545	0.242	0.481	3874.
125	52.66949	1430.53	203.6	-59.327	-59.116	0.62520	0.245	0.486	3631.
130	51.96298	1251.70	185.6	-56.891	-56.677	0.64434	0.243	0.489	3413.
135	51.18679	1102.89	170.0	-54.444	-54.227	0.66283	0.241	0.491	3227.
140	50.40188	976.36	156.1	-51.989	-51.769	0.68071	0.238	0.492	3061.
145	49.58819	866.69	143.6	-49.526	-49.302	0.69802	0.235	0.494	2908.
150	48.74479	769.87	132.2	-47.051	-46.823	0.71483	0.232	0.497	2766.
155	47.86961	683.01	121.9	-44.557	-44.325	0.73121	0.230	0.502	2630.
160	46.95931	604.03	112.3	-42.038	-41.801	0.74723	0.228	0.508	2499.
*164.928	46.02295	532.42	103.5	-39.521	-39.280	0.76275	0.226	0.516	2373.
*164.928	1.07301	48.71	0.456	26.553	36.908	1.22495	0.193	0.307	598.
165	1.07235	48.76	0.456	26.568	36.930	1.22508	0.193	0.307	598.
170	1.02813	51.66	0.433	27.636	38.443	1.23412	0.191	0.299	612.
175	0.98833	54.45	0.412	28.681	39.923	1.24270	0.189	0.293	625.
180	0.95221	57.14	0.394	29.706	41.374	1.25088	0.188	0.288	637.
185	0.91918	59.75	0.378	30.716	42.803	1.25871	0.187	0.284	649.
190	0.88880	62.30	0.364	31.712	44.213	1.26622	0.186	0.280	660.
195	0.86072	64.78	0.350	32.697	45.606	1.27346	0.185	0.277	671.
200	0.83464	67.22	0.338	33.673	46.985	1.28044	0.184	0.274	682.
205	0.81033	69.62	0.327	34.640	48.351	1.28719	0.183	0.272	692.
210	0.78758	71.98	0.317	35.600	49.707	1.29373	0.183	0.270	702.
215	0.76624	74.30	0.307	36.553	51.054	1.30006	0.182	0.268	712.
220	0.74616	76.60	0.299	37.502	52.392	1.30622	0.182	0.257	722.
225	0.72722	78.87	0.290	38.445	53.723	1.31220	0.181	0.256	731.
230	0.70932	81.12	0.283	39.384	55.048	1.31802	0.181	0.264	741.
235	0.69236	83.34	0.275	40.319	56.367	1.32370	0.181	0.263	750.
240	0.67627	85.55	0.268	41.251	57.680	1.32923	0.180	0.262	759.
245	0.66097	87.74	0.262	42.179	58.989	1.33463	0.180	0.261	768.
250	0.64640	89.92	0.256	43.105	60.294	1.33990	0.180	0.261	777.
260	0.61925	94.22	0.244	44.950	62.892	1.35009	0.180	0.259	794.
270	0.59442	98.48	0.234	46.786	65.477	1.35984	0.179	0.258	810.
280	0.57163	102.70	0.225	48.615	68.052	1.36921	0.179	0.257	826.
290	0.55061	106.88	0.216	50.438	70.617	1.37821	0.179	0.256	842.
300	0.53115	111.03	0.208	52.256	73.175	1.38688	0.179	0.255	858.
320	0.49624	119.26	0.194	55.980	78.270	1.40332	0.178	0.254	887.
340	0.46579	127.40	0.182	59.492	83.345	1.41871	0.178	0.253	916.
360	0.43897	135.48	0.171	63.093	88.404	1.43316	0.178	0.253	944.
380	0.41515	143.50	0.161	66.687	93.450	1.44681	0.178	0.252	971.
400	0.39384	151.48	0.153	70.274	98.485	1.45972	0.178	0.252	996.
420	0.37465	159.42	0.145	73.856	103.513	1.47198	0.178	0.251	1022.
440	0.35728	167.34	0.138	77.434	108.533	1.48366	0.178	0.251	1046.
460	0.34147	175.22	0.132	81.009	113.547	1.49481	0.178	0.251	1070.
480	0.32702	183.09	0.127	84.581	118.557	1.50547	0.178	0.250	1093.
500	0.31376	190.93	0.121	88.151	123.563	1.51568	0.178	0.250	1116.
520	0.30155	198.76	0.117	91.719	128.565	1.52549	0.178	0.250	1139.
540	0.29026	206.57	0.112	95.286	133.565	1.53493	0.178	0.250	1160.
560	0.27979	214.38	0.108	98.852	138.562	1.54402	0.178	0.250	1182.
580	0.27006	222.17	0.104	102.417	143.559	1.55278	0.178	0.250	1203.
600	0.26099	229.95	0.101	105.983	148.554	1.56125	0.178	0.250	1223.
650	0.24080	249.36	0.093	114.900	161.042	1.58124	0.178	0.250	1273.
700	0.22352	268.73	0.086	123.828	173.536	1.59976	0.178	0.250	1321.
750	0.20857	288.06	0.080	132.773	186.045	1.61702	0.179	0.250	1367.
800	0.19550	307.37	0.075	141.745	198.579	1.63320	0.179	0.251	1411.
850	0.18398	326.65	0.071	150.752	211.144	1.64843	0.180	0.252	1454.
900	0.17374	345.92	0.067	159.801	223.750	1.66284	0.181	0.253	1494.
950	0.16459	365.18	0.063	168.899	236.405	1.67653	0.182	0.254	1534.
1000	0.15636	384.42	0.060	178.054	249.114	1.68957	0.184	0.255	1572.
1100	0.14214	422.87	0.055	196.554	274.722	1.71397	0.186	0.257	1646.
1200	0.13030	461.29	0.050	215.338	300.610	1.73649	0.189	0.260	1715.
1300	0.12028	499.69	0.046	234.428	326.802	1.75746	0.192	0.263	1781.
1400	0.11169	538.07	0.043	253.833	353.308	1.77710	0.196	0.267	1844.
1500	0.10425	576.44	0.040	273.554	380.128	1.79560	0.199	0.270	1904.
2000	0.07821	768.15	0.030	376.551	518.610	1.87518	0.213	0.284	2179.
2500	0.06258	959.77	0.024	485.464	662.998	1.93958	0.222	0.293	2422.
3000	0.05216	1151.33	0.020	598.508	811.514	1.99372	0.229	0.300	2643.
3500	0.04472	1342.88	0.017	714.410	962.886	2.04038	0.234	0.305	2847.

* INDICATES TWO PHASE BOUNDARY

70 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.858	54.18342	1994.67	256.0	-64.663	-64.424	0.58045	0.230	0.466	4326.
115	54.03607	1923.24	249.6	-64.130	-63.890	0.58512	0.234	0.470	4233.
120	53.37175	1651.06	224.5	-61.754	-61.511	0.60537	0.242	0.481	3894.
125	52.67648	1432.37	203.6	-59.339	-59.092	0.62511	0.245	0.486	3630.
130	51.95086	1253.60	185.7	-56.904	-56.654	0.64423	0.244	0.489	3414.
135	51.19585	1104.70	170.0	-54.458	-54.205	0.66272	0.241	0.491	3227.
140	50.41212	978.17	156.1	-52.005	-51.748	0.68059	0.238	0.492	3061.
145	49.59972	868.51	143.6	-49.544	-49.283	0.69789	0.235	0.494	2910.
150	48.75776	771.72	132.3	-47.071	-46.805	0.71470	0.232	0.497	2768.
155	47.88423	684.89	122.0	-44.579	-44.309	0.73106	0.230	0.502	2632.
160	46.97583	605.94	112.4	-42.063	-41.787	0.74708	0.228	0.507	2502.
165	46.02782	533.39	103.5	-39.512	-39.230	0.76281	0.226	0.515	2374.
*168.360	45.36523	487.65	97.8	-37.773	-37.487	0.77327	0.225	0.522	2289.
*168.360	1.24451	48.09	0.535	26.803	37.219	1.21721	0.195	0.315	600.
170	1.22461	49.10	0.525	27.165	37.733	1.22024	0.194	0.312	604.
175	1.17605	52.10	0.498	28.248	39.271	1.22916	0.192	0.304	618.
180	1.13061	54.97	0.475	29.307	40.772	1.23762	0.190	0.297	631.
185	1.08942	57.73	0.454	30.345	42.242	1.24568	0.189	0.292	643.
190	1.05179	60.42	0.435	31.365	43.690	1.25340	0.187	0.287	655.
195	1.01721	63.02	0.419	32.372	45.115	1.26080	0.186	0.283	666.
200	0.98525	65.57	0.403	33.366	46.523	1.26793	0.185	0.280	678.
205	0.95559	68.06	0.389	34.350	47.915	1.27481	0.184	0.277	688.
210	0.92795	70.51	0.377	35.325	49.294	1.28145	0.184	0.275	699.
215	0.90210	72.91	0.365	36.292	50.661	1.28789	0.183	0.272	709.
220	0.87785	75.28	0.354	37.252	52.019	1.29413	0.183	0.271	719.
225	0.85503	77.62	0.344	38.207	53.367	1.30019	0.182	0.269	729.
230	0.83351	79.92	0.334	39.156	54.708	1.30608	0.182	0.267	738.
235	0.81317	82.21	0.325	40.101	56.041	1.31182	0.181	0.266	748.
240	0.79390	84.47	0.317	41.041	57.368	1.31741	0.181	0.265	757.
245	0.77562	86.71	0.309	41.977	58.690	1.32286	0.181	0.264	766.
250	0.75823	88.93	0.302	42.910	60.006	1.32818	0.180	0.263	775.
260	0.72589	93.32	0.288	44.768	62.625	1.33945	0.180	0.261	792.
270	0.69640	97.65	0.275	46.616	65.229	1.34828	0.180	0.260	809.
280	0.66936	101.94	0.264	48.455	67.820	1.35770	0.179	0.259	825.
290	0.64448	106.18	0.254	50.287	70.400	1.36675	0.179	0.258	841.
300	0.62147	110.39	0.244	52.113	72.971	1.37547	0.179	0.257	857.
320	0.58029	118.71	0.227	55.751	78.089	1.39198	0.179	0.255	887.
340	0.54443	126.93	0.213	59.374	83.183	1.40743	0.178	0.254	916.
360	0.51290	135.08	0.200	62.985	88.258	1.42193	0.178	0.253	943.
380	0.48492	143.16	0.189	66.587	93.318	1.43561	0.178	0.253	970.
400	0.45992	151.19	0.179	70.181	98.366	1.44855	0.178	0.252	996.
420	0.43742	159.18	0.170	73.769	103.403	1.46084	0.178	0.252	1022.
440	0.41707	167.14	0.162	77.353	108.433	1.47254	0.178	0.251	1046.
460	0.39856	175.06	0.155	80.933	113.456	1.48371	0.178	0.251	1070.
480	0.38166	182.96	0.148	84.509	118.473	1.49438	0.178	0.251	1094.
500	0.36615	190.84	0.142	88.083	123.485	1.50461	0.178	0.251	1117.
520	0.35187	198.69	0.136	91.655	128.494	1.51444	0.178	0.250	1139.
540	0.33867	206.53	0.131	95.225	133.499	1.52388	0.178	0.250	1161.
560	0.32644	214.36	0.126	98.794	138.502	1.53298	0.178	0.250	1182.
580	0.31507	222.17	0.122	102.362	143.503	1.54175	0.178	0.250	1203.
600	0.30448	229.97	0.118	105.930	148.503	1.55023	0.178	0.250	1224.
650	0.28089	249.42	0.108	114.853	161.000	1.57023	0.178	0.250	1274.
700	0.26072	268.83	0.101	123.785	173.502	1.58876	0.178	0.250	1322.
750	0.24327	288.19	0.094	132.735	186.018	1.60603	0.179	0.251	1368.
800	0.22802	307.52	0.088	141.710	198.557	1.62222	0.180	0.251	1412.
850	0.21458	326.83	0.083	150.719	211.128	1.63746	0.180	0.252	1454.
900	0.20264	346.12	0.078	159.771	223.739	1.65188	0.181	0.253	1495.
950	0.19197	365.39	0.074	168.872	236.397	1.66556	0.182	0.254	1535.
1000	0.18216	384.64	0.070	178.028	249.110	1.67861	0.184	0.255	1573.
1100	0.16578	423.12	0.064	196.532	274.723	1.70372	0.186	0.257	1646.
1200	0.15197	461.56	0.058	215.319	300.616	1.72554	0.189	0.260	1715.
1300	0.14029	499.97	0.054	234.411	326.812	1.74651	0.192	0.264	1781.
1400	0.13027	538.37	0.050	253.818	353.320	1.76615	0.196	0.267	1844.
1500	0.12160	576.74	0.047	273.541	380.144	1.78466	0.199	0.270	1905.
2000	0.09123	768.49	0.035	376.544	518.634	1.86425	0.213	0.294	2179.
2500	0.07300	960.11	0.028	485.460	663.027	1.97864	0.222	0.293	2422.
3000	0.06085	1151.69	0.023	598.507	811.545	1.98278	0.229	0.300	2643.
3500	0.05216	1343.23	0.020	714.410	962.918	2.02944	0.234	0.305	2848.

* INDICATES TWO PHASE BOUNDARY

80 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*113.886	54.18474	1994.85	255.8	-64.660	-64.386	0.58048	0.231	0.456	4323.
115	54.04127	1925.15	249.5	-64.139	-63.865	0.58504	0.234	0.470	4232.
120	53.37780	1652.93	224.5	-61.764	-61.487	0.60528	0.243	0.490	3893.
125	52.68345	1434.20	203.6	-59.350	-59.059	0.62501	0.245	0.436	3630.
130	51.95884	1255.41	185.7	-56.917	-56.632	0.64413	0.244	0.439	3414.
135	51.20489	1106.50	170.0	-54.473	-54.184	0.66261	0.241	0.490	3228.
140	50.42233	979.97	156.2	-52.021	-51.728	0.68047	0.238	0.492	3062.
145	49.61122	870.33	143.7	-49.562	-49.263	0.69777	0.235	0.494	2911.
150	48.77071	773.57	132.4	-47.090	-46.787	0.71456	0.232	0.497	2769.
155	47.99881	686.77	122.0	-44.601	-44.292	0.73092	0.230	0.501	2634.
160	46.99231	607.86	112.5	-42.088	-41.772	0.74692	0.228	0.507	2504.
165	46.04653	535.35	103.6	-39.540	-39.218	0.76264	0.226	0.515	2376.
170	45.05506	468.13	95.2	-36.948	-36.619	0.77816	0.225	0.525	2251.
*171.453	44.75728	449.47	92.9	-36.184	-35.853	0.78264	0.225	0.529	2214.
*171.453	1.41674	47.38	0.616	26.998	37.455	1.21039	0.197	0.323	601.
175	1.37260	49.66	0.592	27.795	38.588	1.21693	0.195	0.316	611.
180	1.31633	52.73	0.561	28.890	40.145	1.22571	0.192	0.307	625.
185	1.26580	55.66	0.535	29.960	41.663	1.23403	0.191	0.300	638.
190	1.22000	58.49	0.511	31.007	43.150	1.24196	0.189	0.295	650.
195	1.17818	61.22	0.490	32.037	44.611	1.24955	0.188	0.290	662.
200	1.13976	63.88	0.471	33.052	46.049	1.25683	0.187	0.286	673.
205	1.10426	66.48	0.454	34.053	47.469	1.26384	0.186	0.282	684.
210	1.07130	69.01	0.439	35.044	48.873	1.27061	0.185	0.279	695.
215	1.04059	71.50	0.424	36.026	50.262	1.27715	0.184	0.277	706.
220	1.01188	73.94	0.411	36.999	51.640	1.28348	0.183	0.274	716.
225	0.98493	76.35	0.399	37.965	53.006	1.28962	0.183	0.272	726.
230	0.95958	78.72	0.387	38.925	54.363	1.29559	0.182	0.271	736.
235	0.93567	81.06	0.377	39.879	55.712	1.30139	0.182	0.269	745.
240	0.91306	83.38	0.367	40.828	57.053	1.30704	0.182	0.268	755.
245	0.89164	85.67	0.357	41.773	58.388	1.31254	0.181	0.266	764.
250	0.87132	87.94	0.349	42.714	59.716	1.31791	0.181	0.265	773.
260	0.83357	92.41	0.332	44.585	62.357	1.32827	0.180	0.263	790.
270	0.79924	96.82	0.318	46.444	64.980	1.33816	0.180	0.261	807.
280	0.76783	101.17	0.304	48.294	67.587	1.34765	0.180	0.260	824.
290	0.73897	105.48	0.292	50.135	70.132	1.35675	0.179	0.259	840.
300	0.71233	109.74	0.281	51.969	72.766	1.36551	0.179	0.258	856.
320	0.66473	118.16	0.261	55.621	77.908	1.38211	0.179	0.256	886.
340	0.62336	126.46	0.245	59.256	83.021	1.39761	0.178	0.255	915.
360	0.58704	134.68	0.230	62.876	88.112	1.41216	0.178	0.254	943.
380	0.55435	142.82	0.217	66.486	93.136	1.42587	0.178	0.253	970.
400	0.52612	150.91	0.205	70.088	98.246	1.43985	0.178	0.253	996.
420	0.50029	158.95	0.195	73.683	103.294	1.45117	0.178	0.252	1022.
440	0.47694	166.94	0.186	77.272	108.333	1.46289	0.178	0.252	1046.
460	0.45571	174.90	0.177	80.856	113.364	1.47407	0.178	0.251	1070.
480	0.43633	182.84	0.169	84.437	118.389	1.48476	0.178	0.251	1094.
500	0.41856	190.74	0.162	88.015	123.408	1.49501	0.178	0.251	1117.
520	0.40220	198.63	0.156	91.590	128.423	1.50484	0.178	0.251	1139.
540	0.38709	206.49	0.150	95.163	133.434	1.51430	0.178	0.250	1161.
560	0.37310	214.34	0.145	98.735	138.442	1.52340	0.178	0.250	1183.
580	0.36009	222.17	0.139	102.306	143.447	1.53218	0.178	0.250	1204.
600	0.34796	229.99	0.135	105.877	148.451	1.54067	0.178	0.250	1224.
650	0.32098	249.49	0.124	114.805	160.958	1.56069	0.178	0.250	1274.
700	0.29792	268.93	0.115	123.742	173.469	1.57923	0.178	0.250	1322.
750	0.27796	288.32	0.107	132.696	185.992	1.59651	0.179	0.251	1368.
800	0.26053	307.68	0.100	141.675	198.536	1.61270	0.180	0.251	1412.
850	0.24517	327.01	0.095	150.687	211.112	1.62795	0.180	0.252	1455.
900	0.23153	346.31	0.089	159.741	223.727	1.64237	0.181	0.253	1496.
950	0.21933	365.60	0.084	168.844	236.389	1.65606	0.182	0.254	1535.
1000	0.20935	384.87	0.080	178.003	249.105	1.66911	0.184	0.255	1574.
1100	0.18941	423.37	0.073	196.511	274.725	1.69352	0.186	0.258	1647.
1200	0.17363	461.83	0.067	215.300	300.622	1.71606	0.189	0.260	1716.
1300	0.16028	500.26	0.062	234.395	326.821	1.73702	0.192	0.264	1782.
1400	0.14884	538.66	0.057	253.804	353.333	1.75667	0.196	0.267	1845.
1500	0.13893	577.05	0.053	273.528	380.155	1.77518	0.199	0.270	1905.
2000	0.10424	768.83	0.040	376.537	518.658	1.85477	0.213	0.284	2180.
2500	0.08741	960.46	0.032	485.456	663.055	1.91917	0.222	0.293	2423.
3000	0.06953	1152.04	0.027	598.505	811.576	1.97331	0.229	0.300	2644.
3500	0.05961	1343.59	0.023	714.410	962.951	2.01997	0.234	0.305	2848.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

90 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.913	54.18646	1995.02	255.6	-64.656	-64.349	0.58051	0.231	0.466	4319.
115	54.04646	1927.06	249.4	-64.148	-63.840	0.58495	0.234	0.470	4231.
120	53.38395	1654.80	224.4	-61.775	-61.462	0.60519	0.243	0.480	3893.
125	52.69042	1436.03	203.5	-59.362	-59.046	0.62492	0.245	0.486	3630.
130	51.96680	1257.23	185.7	-56.930	-56.609	0.64403	0.244	0.489	3414.
135	51.21392	1108.30	170.1	-54.467	-54.162	0.66250	0.242	0.490	3228.
140	50.43253	981.78	156.2	-52.038	-51.707	0.68036	0.238	0.492	3063.
145	49.62270	872.15	143.8	-49.580	-49.244	0.69765	0.235	0.494	2912.
150	48.78362	775.41	132.5	-47.110	-46.769	0.71443	0.232	0.497	2771.
155	47.91335	688.64	122.1	-44.624	-44.276	0.73078	0.230	0.501	2636.
160	47.00874	609.78	112.6	-42.112	-41.758	0.74677	0.228	0.507	2506.
165	46.06518	537.31	103.7	-39.568	-39.206	0.76247	0.226	0.514	2379.
170	45.07637	470.14	95.4	-36.979	-36.609	0.77797	0.225	0.525	2254.
*174.275	44.18840	416.26	89.6	-34.720	-34.343	0.79114	0.224	0.536	2147.
*174.276	1.59004	46.61	0.699	27.148	27.630	1.20427	0.198	0.332	602.
175	1.57930	47.11	0.693	27.316	27.869	1.20564	0.198	0.330	604.
180	1.51028	50.40	0.654	28.455	29.490	1.21477	0.195	0.319	618.
185	1.44898	53.52	0.621	29.559	31.061	1.22339	0.193	0.310	632.
190	1.39392	56.51	0.591	30.637	32.593	1.23156	0.191	0.303	645.
195	1.34401	59.38	0.566	31.692	34.092	1.23934	0.189	0.297	657.
200	1.29863	62.16	0.543	32.729	35.564	1.24680	0.188	0.292	669.
205	1.25653	64.86	0.522	33.750	37.013	1.25396	0.187	0.288	680.
210	1.21781	67.50	0.503	34.758	38.443	1.26085	0.186	0.284	692.
215	1.18187	70.07	0.486	35.755	39.856	1.26750	0.185	0.281	702.
220	1.14836	72.59	0.470	36.741	41.254	1.27392	0.184	0.278	713.
225	1.11701	75.07	0.456	37.720	42.640	1.28015	0.184	0.276	723.
230	1.08760	77.51	0.442	38.691	44.014	1.28619	0.183	0.274	733.
235	1.05991	79.91	0.430	39.655	45.379	1.29206	0.183	0.272	743.
240	1.03379	82.28	0.418	40.613	46.735	1.29777	0.182	0.270	752.
245	1.00909	84.62	0.407	41.566	48.082	1.30333	0.182	0.269	762.
250	0.98568	86.96	0.396	42.515	49.423	1.30875	0.181	0.268	771.
260	0.94232	91.51	0.377	44.400	52.086	1.31919	0.181	0.265	789.
270	0.90297	95.99	0.360	46.277	54.729	1.32917	0.180	0.263	806.
280	0.86705	100.41	0.345	48.132	57.353	1.33871	0.180	0.262	823.
290	0.83409	104.78	0.331	49.982	59.963	1.34787	0.180	0.260	839.
300	0.80373	109.10	0.318	51.825	62.561	1.35668	0.179	0.259	855.
320	0.74955	117.61	0.296	55.491	67.726	1.37334	0.179	0.257	885.
340	0.70258	126.00	0.276	59.137	72.858	1.38890	0.179	0.256	915.
360	0.66140	134.28	0.260	62.768	77.966	1.40350	0.178	0.255	943.
380	0.62495	142.49	0.245	66.386	83.054	1.41725	0.178	0.254	970.
400	0.59244	150.63	0.232	69.995	88.126	1.43026	0.178	0.253	996.
420	0.56325	158.71	0.220	73.596	93.185	1.44260	0.178	0.253	1022.
440	0.53687	166.75	0.209	77.190	98.233	1.45435	0.178	0.252	1047.
460	0.51291	174.75	0.200	80.780	103.273	1.46555	0.178	0.252	1071.
480	0.49104	182.71	0.191	84.365	108.305	1.47626	0.178	0.251	1094.
500	0.47100	190.65	0.183	87.947	113.331	1.48651	0.178	0.251	1117.
520	0.45256	198.56	0.176	91.526	118.352	1.49636	0.178	0.251	1140.
540	0.43553	206.45	0.169	95.102	123.369	1.50583	0.178	0.251	1162.
560	0.41975	214.32	0.163	98.677	128.382	1.51494	0.178	0.251	1183.
580	0.40510	222.17	0.157	102.251	133.392	1.52373	0.178	0.250	1204.
600	0.39144	230.01	0.152	105.824	138.392	1.53222	0.178	0.250	1225.
650	0.36106	249.55	0.140	114.758	148.400	1.55226	0.178	0.250	1275.
700	0.33509	269.03	0.130	123.699	158.417	1.57081	0.178	0.250	1323.
750	0.31264	288.45	0.121	132.657	168.435	1.58810	0.179	0.251	1369.
800	0.29303	307.83	0.113	141.639	178.453	1.60430	0.180	0.251	1413.
850	0.27574	327.18	0.106	150.655	188.471	1.61956	0.180	0.252	1455.
900	0.26039	346.51	0.100	159.711	198.489	1.63398	0.181	0.253	1496.
950	0.24667	365.81	0.095	168.817	208.507	1.64768	0.182	0.254	1536.
1000	0.23433	385.09	0.090	177.973	218.525	1.66073	0.184	0.255	1574.
1100	0.21302	423.62	0.082	196.489	238.543	1.68515	0.186	0.258	1647.
1200	0.19528	462.10	0.075	215.281	258.561	1.70768	0.189	0.260	1717.
1300	0.18027	500.54	0.069	234.378	278.579	1.72866	0.192	0.264	1782.
1400	0.16740	538.96	0.064	253.789	298.597	1.74830	0.196	0.267	1845.
1500	0.15626	577.36	0.060	273.515	318.615	1.76681	0.199	0.270	1906.
2000	0.11774	769.16	0.045	376.530	418.633	1.84641	0.213	0.284	2180.
2500	0.09382	960.31	0.036	485.453	518.651	1.91081	0.222	0.293	2423.
3000	0.07821	1152.39	0.030	598.503	618.669	1.96495	0.229	0.300	2644.
3500	0.06705	1343.94	0.026	714.410	718.687	2.01161	0.234	0.305	2849.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

100 PSIA ISORAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*113.940	54.18799	1995.19	255.3	-64.653	-64.311	0.58054	0.231	0.466	4316.
115	54.05165	1928.97	249.4	-64.158	-63.815	0.58487	0.234	0.469	4230.
120	53.38989	1656.66	224.4	-61.785	-61.438	0.60510	0.243	0.480	3893.
125	52.69738	1437.87	203.5	-59.374	-59.023	0.62483	0.245	0.486	3630.
130	51.97474	1259.04	185.7	-56.943	-56.587	0.64393	0.244	0.488	3414.
135	51.22294	1110.10	170.1	-54.502	-54.140	0.66240	0.242	0.490	3229.
140	50.44270	983.59	156.3	-52.054	-51.687	0.68024	0.239	0.492	3064.
145	49.63415	873.97	143.8	-49.598	-49.225	0.69752	0.235	0.493	2913.
150	48.79650	777.25	132.6	-47.130	-46.751	0.71430	0.233	0.496	2772.
155	47.92786	690.52	122.2	-44.646	-44.259	0.73063	0.230	0.500	2638.
160	47.02511	611.69	112.7	-42.137	-41.743	0.74661	0.228	0.506	2508.
165	46.08376	539.27	103.8	-39.595	-39.193	0.76230	0.226	0.514	2381.
170	45.09760	472.15	95.5	-37.010	-36.599	0.77779	0.225	0.524	2257.
175	44.05922	409.50	87.6	-34.369	-33.949	0.79316	0.224	0.537	2132.
*176.882	43.65099	386.93	84.7	-33.357	-32.933	0.79893	0.224	0.543	2085.
*176.882	1.76471	45.79	0.784	27.262	37.756	1.19869	0.199	0.340	602.
180	1.71359	47.98	0.754	27.997	38.804	1.20457	0.197	0.332	611.
185	1.63976	51.31	0.712	29.142	40.435	1.21351	0.195	0.321	626.
190	1.57413	54.47	0.677	30.253	42.016	1.22194	0.193	0.312	639.
195	1.51513	57.50	0.645	31.336	43.558	1.22995	0.191	0.305	652.
200	1.46160	60.41	0.617	32.397	45.066	1.23759	0.189	0.299	665.
205	1.41267	63.23	0.593	33.439	46.547	1.24490	0.188	0.294	676.
210	1.36768	65.96	0.570	34.465	48.005	1.25193	0.187	0.289	698.
215	1.32607	68.63	0.550	35.478	49.442	1.25869	0.186	0.286	699.
220	1.28742	71.23	0.531	36.479	50.863	1.26522	0.185	0.283	710.
225	1.25138	73.78	0.514	37.470	52.268	1.27154	0.184	0.280	720.
230	1.21764	76.29	0.498	38.453	53.661	1.27766	0.184	0.277	730.
235	1.18597	78.75	0.484	39.428	55.042	1.28360	0.183	0.275	740.
240	1.15614	81.18	0.470	40.396	56.413	1.28938	0.183	0.273	750.
245	1.12800	83.58	0.457	41.358	57.774	1.29499	0.182	0.272	760.
250	1.10137	85.94	0.445	42.314	59.128	1.30046	0.182	0.270	769.
260	1.05215	90.59	0.424	44.214	61.814	1.31100	0.181	0.267	787.
270	1.00760	95.16	0.404	46.098	64.476	1.32104	0.181	0.265	804.
280	0.96701	99.65	0.387	47.969	67.118	1.33065	0.180	0.263	821.
290	0.92985	104.08	0.371	49.829	69.744	1.33987	0.180	0.262	838.
300	0.89566	108.45	0.356	51.680	72.355	1.34872	0.180	0.261	854.
320	0.83478	117.07	0.331	55.361	77.544	1.36546	0.179	0.258	885.
340	0.78209	125.53	0.309	59.018	82.696	1.38108	0.179	0.257	914.
360	0.73598	133.89	0.290	62.659	87.820	1.39572	0.178	0.256	943.
380	0.69521	142.16	0.273	66.285	92.922	1.40952	0.178	0.255	970.
400	0.65890	150.35	0.258	69.901	98.006	1.42256	0.178	0.254	996.
420	0.62630	158.48	0.245	73.509	103.076	1.43492	0.178	0.253	1022.
440	0.59688	166.56	0.233	77.109	108.134	1.44669	0.178	0.253	1047.
460	0.57016	174.59	0.222	80.703	113.182	1.45791	0.178	0.252	1071.
480	0.54579	182.59	0.213	84.293	118.221	1.46863	0.178	0.252	1094.
500	0.52347	190.56	0.204	87.879	123.254	1.47891	0.178	0.251	1117.
520	0.50293	198.50	0.196	91.461	128.291	1.48876	0.178	0.251	1140.
540	0.48397	206.41	0.188	95.041	133.303	1.49824	0.178	0.251	1162.
560	0.46641	214.30	0.181	98.619	138.322	1.50737	0.178	0.251	1184.
580	0.45010	222.18	0.175	102.195	143.337	1.51617	0.178	0.251	1205.
600	0.43491	230.04	0.169	105.771	148.349	1.52466	0.178	0.251	1225.
650	0.40112	249.62	0.155	114.711	160.875	1.54471	0.178	0.250	1275.
700	0.37226	269.13	0.144	123.657	173.402	1.56328	0.178	0.251	1323.
750	0.34730	288.58	0.134	132.618	185.938	1.58058	0.179	0.251	1369.
800	0.32550	307.99	0.126	141.604	198.494	1.59679	0.180	0.251	1413.
850	0.30630	327.36	0.118	150.622	211.080	1.61205	0.180	0.252	1456.
900	0.28924	346.71	0.112	159.682	223.703	1.62648	0.181	0.253	1497.
950	0.27400	366.02	0.106	168.789	236.373	1.64019	0.182	0.254	1536.
1000	0.26029	385.32	0.100	177.952	249.096	1.65323	0.184	0.255	1575.
1100	0.23662	423.87	0.091	196.467	274.727	1.67765	0.186	0.258	1648.
1200	0.21671	462.37	0.084	215.262	300.634	1.70019	0.189	0.261	1717.
1300	0.20024	500.82	0.077	234.361	326.641	1.72117	0.192	0.264	1783.
1400	0.18595	539.26	0.072	253.775	353.359	1.74082	0.196	0.267	1846.
1500	0.17357	577.66	0.067	273.503	380.190	1.75933	0.199	0.270	1906.
2000	0.13024	769.50	0.050	376.523	518.706	1.83893	0.213	0.284	2181.
2500	0.10423	961.16	0.040	485.449	663.112	1.90334	0.222	0.293	2424.
3000	0.08688	1152.75	0.033	598.501	811.638	1.95748	0.229	0.300	2643.
3500	0.07449	1344.30	0.029	714.409	963.016	2.00414	0.234	0.305	2849.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

150 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*114.076	54.19566	1996.10	254.2	-64.635	-64.123	0.58069	0.233	0.466	4299.
115	54.07750	1938.52	249.0	-64.205	-63.691	0.58446	0.236	0.469	4225.
120	53.41999	1666.00	224.2	-61.838	-61.318	0.60466	0.244	0.479	3890.
125	52.73204	1447.03	203.4	-59.432	-58.906	0.62435	0.247	0.485	3630.
130	52.01431	1268.08	185.7	-57.008	-56.474	0.64343	0.245	0.488	3416.
135	51.26780	1119.09	170.2	-54.574	-54.032	0.66186	0.243	0.489	3232.
140	50.49330	992.58	156.5	-52.134	-51.584	0.67967	0.240	0.490	3069.
145	49.69107	883.04	144.2	-49.686	-49.127	0.69691	0.236	0.492	2919.
150	48.86045	786.43	133.0	-47.228	-46.660	0.71364	0.233	0.495	2780.
155	47.99978	699.85	122.7	-44.755	-44.176	0.72993	0.231	0.499	2647.
160	47.10622	621.21	113.2	-42.259	-41.669	0.74585	0.229	0.504	2519.
165	46.17565	549.00	104.4	-39.732	-39.130	0.76147	0.227	0.512	2394.
170	45.20239	482.13	96.1	-37.164	-36.549	0.77688	0.226	0.521	2271.
175	44.17891	419.77	88.3	-34.544	-33.915	0.79215	0.225	0.533	2148.
180	43.09447	361.22	80.9	-31.857	-31.213	0.80737	0.224	0.549	2025.
185	41.93453	305.86	73.7	-29.083	-28.421	0.82267	0.223	0.569	1900.
*187.661	41.27920	277.47	69.9	-27.562	-26.839	0.83089	0.223	0.533	1832.
*187.661	2.66650	41.19	1.2	27.436	37.853	1.17593	0.206	0.390	601.
190	2.59877	43.21	1.2	28.062	38.751	1.18068	0.204	0.378	609.
195	2.47048	47.25	1.1	29.345	40.538	1.19023	0.201	0.358	625.
200	2.35971	51.01	1.1	30.569	42.340	1.19910	0.198	0.343	640.
205	2.26232	54.53	1.0	31.746	44.024	1.20742	0.195	0.331	655.
210	2.17554	57.88	0.952	32.888	45.656	1.21528	0.193	0.322	668.
215	2.09736	61.08	0.909	34.000	47.244	1.22276	0.191	0.314	681.
220	2.02631	64.16	0.871	35.088	48.796	1.22990	0.190	0.307	693.
225	1.96126	67.13	0.837	36.156	50.319	1.23674	0.189	0.302	705.
230	1.90135	70.02	0.806	37.206	51.815	1.24332	0.188	0.297	717.
235	1.84587	72.83	0.779	38.242	53.290	1.24966	0.187	0.293	728.
240	1.79427	75.57	0.753	39.265	54.745	1.25579	0.186	0.289	738.
245	1.74608	78.25	0.729	40.276	56.184	1.26172	0.185	0.286	749.
250	1.70093	80.88	0.708	41.278	57.609	1.26748	0.184	0.283	759.
255	1.66184	83.01	0.689	42.257	59.019	1.27300	0.183	0.279	770.
260	1.62489	84.98	0.673	43.208	60.418	1.27835	0.182	0.275	781.
265	1.58987	86.81	0.658	44.138	61.796	1.28355	0.182	0.272	792.
270	1.55565	88.51	0.644	45.046	63.154	1.28861	0.182	0.269	803.
275	1.52211	90.08	0.630	45.933	64.492	1.29353	0.182	0.267	814.
280	1.47862	95.84	0.604	47.138	65.923	1.29890	0.182	0.264	825.
290	1.41351	100.59	0.577	49.049	68.630	1.30840	0.181	0.269	833.
300	1.36365	105.25	0.552	50.945	71.314	1.31750	0.181	0.267	849.
320	1.26692	114.36	0.510	54.701	76.625	1.33464	0.180	0.264	881.
340	1.18409	123.24	0.474	58.419	81.878	1.35056	0.179	0.261	912.
360	1.11216	131.95	0.444	62.111	87.086	1.36545	0.179	0.259	941.
380	1.04899	140.52	0.417	65.780	92.260	1.37943	0.179	0.258	969.
400	0.99300	148.97	0.394	69.433	97.406	1.39263	0.179	0.257	996.
420	0.94295	157.34	0.373	73.073	102.530	1.40513	0.178	0.256	1022.
440	0.89793	165.62	0.354	76.701	107.635	1.41701	0.178	0.255	1047.
460	0.85717	173.84	0.338	80.320	112.726	1.42832	0.178	0.254	1072.
480	0.82007	182.01	0.322	83.932	117.804	1.43913	0.178	0.254	1096.
500	0.78616	190.12	0.309	87.538	122.870	1.44947	0.178	0.253	1119.
520	0.75502	198.20	0.296	91.139	127.928	1.45939	0.178	0.253	1142.
540	0.72631	206.24	0.284	94.735	132.979	1.46892	0.178	0.252	1164.
560	0.69976	214.24	0.274	98.328	138.023	1.47809	0.178	0.252	1186.
580	0.67513	222.22	0.264	101.919	143.061	1.48693	0.178	0.252	1207.
600	0.65221	230.17	0.255	105.507	148.096	1.49546	0.178	0.252	1228.
650	0.60129	249.96	0.234	114.474	160.669	1.51559	0.178	0.251	1278.
700	0.55786	269.65	0.217	123.444	173.235	1.53422	0.179	0.251	1326.
750	0.52036	289.25	0.202	132.425	185.805	1.55156	0.179	0.252	1372.
800	0.48764	308.78	0.189	141.428	198.290	1.56780	0.180	0.252	1416.
850	0.45882	328.26	0.178	150.461	211.000	1.58309	0.180	0.253	1459.
900	0.43325	347.70	0.168	159.534	223.646	1.59755	0.181	0.253	1500.
950	0.41040	367.10	0.159	168.653	236.335	1.61127	0.182	0.254	1539.
1000	0.38986	386.46	0.151	177.826	249.075	1.62434	0.184	0.255	1578.
1100	0.35441	425.13	0.137	196.358	274.734	1.64879	0.186	0.258	1651.
1200	0.32489	463.72	0.125	215.168	300.654	1.67135	0.189	0.261	1720.
1300	0.29493	502.25	0.116	234.279	326.889	1.69234	0.192	0.264	1786.
1400	0.27854	540.74	0.107	253.702	353.423	1.71201	0.196	0.267	1849.
1500	0.26001	579.20	0.100	273.439	380.268	1.73053	0.199	0.270	1909.
2000	0.19515	771.18	0.075	376.488	518.827	1.81015	0.213	0.284	2183.
2500	0.15620	962.91	0.060	485.430	663.255	1.87457	0.222	0.293	2426.
3000	0.13022	1154.52	0.050	598.493	811.793	1.92871	0.229	0.300	2647.
3500	0.11166	1346.08	0.043	714.408	963.178	1.97538	0.234	0.305	2851.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

200 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*114.212	54.20343	1997.06	253.0	-64.617	-63.934	0.58085	0.235	0.466	4283.
115	54.10323	1948.07	248.7	-64.251	-63.566	0.58406	0.237	0.468	4221.
120	53.44992	1675.33	224.0	-61.889	-61.196	0.60423	0.246	0.479	3888.
125	52.76649	1456.18	203.4	-59.490	-58.798	0.62389	0.248	0.484	3630.
130	52.05360	1277.11	185.8	-57.073	-56.361	0.64293	0.247	0.487	3417.
135	51.31230	1128.06	170.4	-54.646	-53.924	0.66132	0.244	0.489	3235.
140	50.54345	1001.56	156.7	-52.213	-51.490	0.67910	0.240	0.489	3073.
145	49.74740	892.07	144.5	-49.774	-49.029	0.69630	0.237	0.491	2925.
150	48.92366	795.58	133.3	-47.325	-46.568	0.71298	0.234	0.494	2787.
155	48.07075	709.14	123.1	-44.862	-44.092	0.72923	0.232	0.497	2656.
160	47.18610	630.67	113.7	-42.378	-41.593	0.74509	0.229	0.502	2529.
165	46.26593	558.67	105.0	-39.865	-39.065	0.76065	0.228	0.509	2406.
170	45.30505	492.03	96.8	-37.315	-36.497	0.77598	0.226	0.518	2285.
175	44.29651	429.93	89.0	-34.715	-33.879	0.79116	0.225	0.530	2164.
180	43.23091	371.70	81.6	-32.053	-31.196	0.80627	0.224	0.544	2044.
185	42.09515	316.73	74.5	-29.311	-28.431	0.82142	0.224	0.563	1921.
190	40.86991	264.42	67.6	-26.465	-25.558	0.83674	0.223	0.588	1795.
195	39.52446	214.06	60.8	-23.474	-22.537	0.85244	0.223	0.623	1663.
*196.090	39.21053	203.26	59.3	-22.798	-21.853	0.85594	0.223	0.633	1633.
*196.090	3.63495	36.08	1.8	27.147	37.336	1.15777	0.213	0.453	596.
200	3.45885	40.08	1.7	28.332	39.039	1.16637	0.208	0.420	612.
205	3.27081	44.72	1.5	29.741	41.065	1.17637	0.204	0.391	630.
210	3.11229	48.95	1.4	31.065	42.965	1.18553	0.201	0.370	646.
215	2.97537	52.89	1.4	32.325	44.772	1.19404	0.198	0.354	662.
220	2.85497	56.58	1.3	33.536	46.508	1.20202	0.196	0.341	676.
225	2.74766	60.09	1.2	34.707	48.186	1.20956	0.194	0.331	690.
230	2.65096	63.44	1.2	35.847	49.818	1.21674	0.192	0.322	702.
235	2.56305	66.66	1.1	36.961	51.411	1.22359	0.190	0.315	715.
240	2.48255	69.76	1.1	38.052	52.971	1.23016	0.189	0.309	727.
245	2.40839	72.78	1.0	39.125	54.503	1.23647	0.188	0.304	738.
250	2.33970	75.71	1.0	40.182	56.011	1.24257	0.187	0.299	749.
260	2.21610	81.36	0.940	42.254	58.966	1.25416	0.186	0.292	770.
270	2.10752	86.78	0.886	44.284	61.857	1.26507	0.184	0.286	790.
280	2.01102	92.02	0.840	46.279	64.695	1.27539	0.183	0.282	809.
290	1.92440	97.11	0.799	48.246	67.492	1.28521	0.183	0.278	827.
300	1.84605	102.07	0.762	50.191	70.254	1.29457	0.182	0.275	845.
320	1.70934	111.69	0.700	54.029	75.696	1.31213	0.181	0.270	878.
340	1.59355	120.99	0.648	57.813	81.054	1.32838	0.180	0.266	910.
360	1.49395	130.06	0.604	61.558	86.350	1.34351	0.180	0.263	940.
380	1.40686	138.93	0.566	65.272	91.597	1.35770	0.179	0.261	969.
400	1.33014	147.65	0.533	68.963	96.806	1.37106	0.179	0.260	996.
420	1.26187	156.24	0.504	72.635	101.985	1.38369	0.179	0.258	1023.
440	1.20064	164.73	0.478	76.292	107.139	1.39568	0.179	0.257	1048.
460	1.14538	173.13	0.455	79.937	112.272	1.40709	0.178	0.256	1073.
480	1.09521	181.46	0.434	83.572	117.388	1.41798	0.178	0.255	1097.
500	1.04943	189.72	0.415	87.198	122.489	1.42839	0.178	0.255	1121.
520	1.00746	197.93	0.398	90.817	127.578	1.43837	0.178	0.254	1144.
540	0.96884	206.09	0.382	94.430	132.656	1.44795	0.178	0.254	1166.
560	0.93316	214.21	0.368	98.038	137.726	1.45717	0.178	0.253	1188.
580	0.90010	222.29	0.354	101.642	142.788	1.46605	0.178	0.253	1209.
600	0.86936	230.34	0.342	105.243	147.844	1.47462	0.178	0.253	1230.
650	0.80118	250.33	0.314	114.239	160.465	1.49483	0.178	0.252	1281.
700	0.74311	270.19	0.291	123.231	173.070	1.51351	0.179	0.252	1329.
750	0.69302	289.93	0.271	132.233	185.674	1.53090	0.179	0.252	1375.
800	0.64936	309.59	0.253	141.253	198.287	1.54718	0.180	0.252	1415.
850	0.61093	329.17	0.238	150.301	210.922	1.56250	0.181	0.253	1462.
900	0.57695	348.70	0.224	159.386	223.589	1.57698	0.181	0.254	1503.
950	0.54641	368.18	0.212	168.517	236.297	1.59072	0.183	0.255	1543.
1000	0.51904	387.62	0.201	177.700	249.054	1.60381	0.184	0.256	1581.
1100	0.47184	426.40	0.183	196.250	274.741	1.62829	0.186	0.258	1654.
1200	0.43256	465.08	0.167	215.074	300.694	1.65087	0.189	0.261	1723.
1300	0.39934	503.69	0.154	234.196	326.938	1.67187	0.193	0.264	1789.
1400	0.37088	542.24	0.143	253.630	353.488	1.69155	0.196	0.267	1852.
1500	0.34622	580.74	0.134	273.375	380.346	1.71008	0.199	0.270	1912.
2000	0.25991	772.87	0.100	376.453	518.947	1.78973	0.213	0.284	2186.
2500	0.20808	964.65	0.080	485.412	663.397	1.85415	0.223	0.294	2428.
3000	0.17350	1156.29	0.067	578.485	811.948	1.90830	0.229	0.300	2649.
3500	0.14878	1347.86	0.057	714.406	963.341	1.95497	0.234	0.305	2853.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

250 PSIA ISODAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*114.348	54.21129	1998.06	251.9	-64.600	-63.746	0.58100	0.237	0.466	4267.
115	54.12884	1957.62	248.3	-64.297	-63.441	0.58366	0.239	0.467	4216.
120	53.47968	1684.65	223.8	-61.941	-61.075	0.60380	0.247	0.478	3886.
125	52.80072	1465.32	203.3	-59.548	-58.671	0.62343	0.249	0.483	3630.
130	52.09262	1286.12	185.8	-57.136	-56.248	0.64243	0.248	0.486	3419.
135	51.35645	1137.01	170.5	-54.716	-53.815	0.66079	0.245	0.487	3238.
140	50.59315	1010.51	157.0	-52.291	-51.376	0.67853	0.241	0.488	3077.
145	49.80317	901.08	144.8	-49.860	-48.931	0.69570	0.238	0.490	2931.
150	48.98615	804.68	133.7	-47.421	-46.476	0.71234	0.235	0.492	2794.
155	48.14080	718.38	123.6	-44.968	-44.007	0.72853	0.232	0.496	2665.
160	47.26480	640.08	114.2	-42.496	-41.516	0.74435	0.230	0.501	2540.
165	46.35467	568.26	105.5	-39.997	-38.998	0.75984	0.228	0.507	2418.
170	45.40567	501.84	97.4	-37.462	-36.442	0.77510	0.227	0.515	2299.
175	44.41146	439.99	89.7	-34.882	-33.839	0.79019	0.226	0.526	2180.
180	43.36359	382.05	82.4	-32.244	-31.176	0.80520	0.225	0.540	2062.
185	42.25040	327.45	75.4	-29.532	-28.436	0.82021	0.224	0.557	1942.
190	41.05510	275.61	68.6	-26.724	-25.597	0.83535	0.224	0.580	1819.
195	39.75178	225.91	61.9	-23.789	-22.624	0.85079	0.224	0.611	1691.
200	38.29638	177.56	55.2	-20.671	-19.462	0.86680	0.224	0.657	1554.
*203.110	37.27957	147.70	50.9	-18.597	-17.356	0.87725	0.224	0.700	1461.
*203.110	4.69921	30.63	2.4	26.501	36.353	1.14163	0.219	0.539	591.
205	4.55972	33.03	2.3	27.189	37.342	1.14648	0.217	0.509	600.
210	4.25423	38.74	2.1	28.853	39.735	1.15801	0.211	0.453	621.
215	4.01103	43.77	1.9	30.359	41.901	1.16820	0.206	0.416	640.
220	3.80893	48.33	1.8	31.759	43.913	1.17746	0.202	0.390	657.
225	3.63612	52.54	1.7	33.081	45.813	1.18600	0.199	0.371	673.
230	3.48533	56.48	1.6	34.345	47.627	1.19397	0.197	0.356	687.
235	3.35171	60.20	1.5	35.562	49.374	1.20149	0.195	0.344	701.
240	3.23186	63.74	1.5	36.742	51.066	1.20861	0.193	0.334	714.
245	3.12334	67.14	1.4	37.891	52.713	1.21541	0.192	0.325	727.
250	3.02427	70.41	1.3	39.015	54.323	1.22191	0.190	0.318	739.
255	2.84913	76.65	1.2	41.200	57.449	1.23417	0.188	0.307	762.
260	2.69818	82.55	1.2	43.320	60.477	1.24560	0.186	0.299	783.
270	2.56597	88.20	1.1	45.390	63.431	1.25635	0.185	0.292	803.
280									
290	2.44870	93.65	1.0	47.420	66.326	1.26650	0.184	0.287	823.
300	2.34364	98.92	0.986	49.420	69.173	1.27616	0.183	0.283	841.
320	2.16237	109.07	0.900	53.345	74.755	1.29417	0.182	0.276	876.
340	2.01061	118.80	0.830	57.199	80.224	1.31075	0.181	0.271	903.
360	1.88107	128.21	0.771	60.999	85.610	1.32614	0.180	0.268	933.
380	1.76878	137.39	0.721	64.760	90.933	1.34053	0.180	0.265	963.
400	1.67027	146.37	0.677	68.490	96.207	1.35406	0.179	0.263	993.
420	1.58298	155.19	0.639	72.196	101.442	1.36683	0.179	0.261	1023.
440	1.50496	163.98	0.606	75.883	106.644	1.37893	0.179	0.259	1049.
460	1.43474	172.46	0.575	79.553	111.820	1.39044	0.179	0.258	1074.
480	1.37114	180.95	0.548	83.211	116.974	1.40141	0.179	0.257	1099.
500	1.31322	189.36	0.524	86.857	122.110	1.41189	0.179	0.256	1122.
520	1.26023	197.70	0.502	90.495	127.230	1.42193	0.178	0.256	1146.
540	1.21152	205.98	0.481	94.124	132.337	1.43156	0.178	0.255	1163.
560	1.16658	214.21	0.463	97.748	137.432	1.44083	0.178	0.255	1190.
580	1.12498	222.39	0.445	101.366	142.518	1.44975	0.178	0.254	1212.
600	1.08634	230.53	0.430	104.980	147.595	1.45836	0.178	0.254	1233.
650	1.00075	250.73	0.394	114.004	160.263	1.47864	0.179	0.253	1283.
700	0.92797	270.75	0.365	123.020	172.908	1.49738	0.179	0.253	1332.
750	0.86527	290.64	0.339	132.041	185.544	1.51482	0.179	0.253	1373.
800	0.81065	310.41	0.317	141.078	198.186	1.53114	0.180	0.253	1422.
850	0.76261	330.10	0.298	150.140	210.846	1.54648	0.181	0.253	1465.
900	0.72003	349.72	0.281	159.239	223.534	1.56099	0.182	0.254	1505.
950	0.68201	369.27	0.266	168.381	236.261	1.57475	0.183	0.255	1546.
1000	0.64784	388.78	0.252	177.574	249.034	1.58785	0.184	0.256	1584.
1100	0.58893	427.68	0.229	196.141	274.750	1.61236	0.186	0.258	1657.
1200	0.53991	466.45	0.209	214.980	300.725	1.63496	0.189	0.261	1726.
1300	0.49847	505.13	0.193	234.114	326.988	1.65598	0.193	0.264	1792.
1400	0.46297	543.74	0.179	253.557	353.553	1.67567	0.196	0.267	1854.
1500	0.43221	582.29	0.167	273.311	380.424	1.69421	0.199	0.270	1915.
2000	0.32453	774.56	0.125	376.418	519.068	1.77388	0.213	0.284	2183.
2500	0.25987	966.40	0.100	485.393	663.540	1.83832	0.223	0.294	2430.
3000	0.21671	1158.07	0.083	598.476	812.104	1.89247	0.229	0.300	2651.
3500	0.18585	1349.64	0.071	714.404	963.504	1.93914	0.234	0.305	2855.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

300 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*114.484	54.21924	1999.12	250.8	-64.582	-63.557	0.58116	0.238	0.465	4252.
115	54.15431	1967.17	248.0	-64.342	-63.316	0.58326	0.240	0.467	4212.
120	53.50928	1693.97	223.6	-61.992	-60.953	0.60337	0.248	0.477	3884.
125	52.83473	1474.45	203.2	-59.604	-58.553	0.62297	0.250	0.482	3630.
130	52.13136	1295.13	185.8	-57.199	-56.134	0.64194	0.249	0.435	3420.
135	51.40025	1145.95	170.7	-54.786	-53.706	0.66027	0.246	0.486	3241.
140	50.64242	1019.43	157.2	-52.369	-51.272	0.67797	0.242	0.487	3082.
145	49.85839	910.05	145.1	-49.946	-48.832	0.69510	0.239	0.439	2937.
150	49.04794	813.74	134.1	-47.515	-46.383	0.71170	0.236	0.491	2802.
155	48.20996	727.57	124.0	-45.073	-43.920	0.72785	0.233	0.494	2673.
160	47.34235	649.43	114.7	-42.612	-41.438	0.74361	0.231	0.499	2550.
165	46.44192	577.79	106.1	-40.126	-38.929	0.75905	0.229	0.505	2430.
170	45.50434	511.57	98.0	-37.606	-36.386	0.77424	0.227	0.513	2312.
175	44.52384	449.95	90.4	-35.045	-33.797	0.78924	0.226	0.523	2195.
180	43.49274	392.28	83.1	-32.429	-31.152	0.80415	0.225	0.536	2079.
185	42.40068	338.01	76.2	-29.745	-28.435	0.81903	0.224	0.552	1962.
190	41.23298	286.60	69.5	-26.974	-25.627	0.83401	0.224	0.573	1842.
195	39.96761	237.48	62.9	-24.088	-22.698	0.84922	0.224	0.601	1718.
200	38.56852	189.96	56.4	-21.042	-19.602	0.86490	0.224	0.641	1587.
205	36.96934	143.18	49.7	-17.757	-16.254	0.88143	0.225	0.704	1442.
*209.176	35.37826	103.68	43.8	-14.706	-13.136	0.89649	0.226	0.799	1304.
*209.176	5.90023	24.90	3.2	25.509	34.925	1.12617	0.226	0.670	585.
210	5.79977	26.22	3.1	25.887	35.465	1.12875	0.225	0.642	589.
215	5.31260	33.23	2.7	27.909	38.366	1.14240	0.217	0.531	614.
220	4.95403	39.13	2.5	29.643	40.856	1.15386	0.211	0.470	636.
225	4.66958	44.33	2.3	31.204	43.101	1.16395	0.206	0.430	654.
230	4.43380	49.04	2.1	32.650	45.179	1.17308	0.203	0.402	671.
235	4.23260	53.40	2.0	34.011	47.137	1.18150	0.200	0.381	687.
240	4.05729	57.47	1.9	35.309	49.002	1.18936	0.197	0.365	702.
245	3.90214	61.32	1.8	36.557	50.794	1.19675	0.195	0.352	716.
250	3.76313	64.98	1.7	37.765	52.528	1.20376	0.194	0.342	729.
260	3.52262	71.87	1.6	40.086	55.857	1.21682	0.191	0.325	754.
270	3.31995	78.31	1.5	42.312	59.046	1.22885	0.189	0.313	776.
280	3.14543	84.40	1.4	44.468	62.130	1.24007	0.187	0.304	798.
290	2.99266	90.22	1.3	46.570	65.133	1.25061	0.185	0.297	818.
300	2.85722	95.81	1.2	48.628	68.072	1.26057	0.184	0.291	837.
320	2.62632	106.49	1.1	52.650	73.802	1.27907	0.183	0.282	873.
340	2.43536	116.65	1.0	56.576	79.388	1.29600	0.182	0.276	907.
360	2.27380	126.43	0.944	60.436	84.868	1.31166	0.181	0.272	938.
380	2.13471	135.90	0.880	64.245	90.269	1.32626	0.180	0.268	968.
400	2.01333	145.14	0.826	68.016	95.609	1.33996	0.180	0.266	997.
420	1.90621	154.19	0.778	71.756	100.900	1.35287	0.180	0.254	1024.
440	1.81082	163.08	0.736	75.473	106.151	1.36508	0.179	0.262	1050.
460	1.72519	171.84	0.698	79.169	111.371	1.37668	0.179	0.260	1076.
480	1.64782	180.49	0.665	82.850	116.563	1.38773	0.179	0.259	1100.
500	1.57750	189.04	0.635	86.517	121.734	1.39829	0.179	0.258	1124.
520	1.51326	197.51	0.607	90.173	126.884	1.40839	0.179	0.257	1148.
540	1.45431	205.90	0.582	93.820	132.019	1.41808	0.179	0.256	1170.
560	1.39999	214.24	0.559	97.459	137.140	1.42739	0.179	0.256	1192.
580	1.34975	222.52	0.538	101.091	142.249	1.43635	0.179	0.255	1214.
600	1.30313	230.75	0.518	104.718	147.349	1.44500	0.179	0.255	1235.
650	1.20001	251.15	0.476	113.769	160.063	1.46535	0.179	0.254	1286.
700	1.11245	271.33	0.439	122.809	172.747	1.48415	0.179	0.253	1335.
750	1.03709	291.36	0.409	131.849	185.416	1.50163	0.179	0.253	1381.
800	0.97151	311.25	0.382	140.903	198.086	1.51799	0.180	0.254	1425.
850	0.91387	331.04	0.359	149.981	210.770	1.53337	0.181	0.254	1468.
900	0.86279	350.75	0.338	159.092	223.480	1.54790	0.182	0.255	1509.
950	0.81721	370.38	0.320	168.245	236.225	1.56168	0.183	0.255	1549.
1000	0.77626	389.96	0.303	177.449	249.015	1.57480	0.184	0.256	1587.
1100	0.70566	428.96	0.275	196.033	274.759	1.59933	0.187	0.259	1660.
1200	0.64694	467.82	0.252	214.886	300.757	1.62195	0.189	0.261	1729.
1300	0.59731	506.58	0.232	234.032	327.038	1.64299	0.193	0.264	1795.
1400	0.55480	545.24	0.215	253.485	353.619	1.66268	0.196	0.267	1857.
1500	0.51796	583.84	0.201	273.248	380.503	1.68123	0.199	0.270	1917.
2000	0.38902	776.26	0.150	376.383	519.187	1.76073	0.213	0.234	2191.
2500	0.31156	968.16	0.120	485.374	663.683	1.82538	0.223	0.294	2433.
3000	0.25985	1155.84	0.100	598.468	812.259	1.87954	0.229	0.300	2653.
3500	0.22247	1351.42	0.086	714.403	963.667	1.92621	0.234	0.305	2856.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

350 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*114.619	54.22728	2000.22	249.7	-64.564	-63.368	0.58132	0.240	0.465	4237.
115	54.17967	1976.72	247.6	-64.387	-63.191	0.58286	0.241	0.466	4208.
120	53.53871	1703.29	223.3	-62.042	-60.831	0.60294	0.249	0.476	3882.
125	52.86854	1483.58	203.1	-59.661	-58.435	0.62251	0.251	0.482	3630.
130	52.16983	1304.12	185.9	-57.262	-56.020	0.64146	0.250	0.484	3422.
135	51.44371	1154.86	170.8	-54.856	-53.596	0.65975	0.247	0.485	3244.
140	50.69125	1028.33	157.4	-52.445	-51.166	0.67742	0.243	0.486	3086.
145	49.91306	918.99	145.4	-50.030	-48.732	0.69451	0.240	0.488	2943.
150	49.10905	822.76	134.5	-47.608	-46.289	0.71107	0.237	0.490	2809.
155	48.27826	736.71	124.5	-45.175	-43.833	0.72718	0.234	0.493	2682.
160	47.41879	658.72	115.2	-42.726	-41.359	0.74289	0.231	0.497	2560.
165	46.52776	587.26	106.7	-40.252	-38.859	0.75827	0.230	0.503	2442.
170	45.60117	521.23	98.6	-37.748	-36.327	0.77339	0.228	0.510	2325.
175	44.63375	459.83	91.0	-35.204	-33.752	0.78832	0.227	0.520	2211.
180	43.61858	402.41	83.9	-32.610	-31.124	0.80312	0.226	0.532	2096.
185	42.54636	348.44	77.0	-29.952	-28.429	0.81789	0.225	0.547	1981.
190	41.40422	297.41	70.3	-27.215	-25.650	0.83271	0.224	0.566	1864.
195	40.17327	248.79	63.9	-24.374	-22.760	0.84772	0.224	0.591	1744.
200	38.82369	202.00	57.5	-21.392	-19.722	0.86310	0.224	0.626	1619.
205	37.30336	156.30	51.1	-18.205	-16.468	0.87917	0.224	0.680	1481.
210	35.50578	110.67	44.3	-14.687	-12.862	0.89655	0.226	0.773	1325.
*214.544	33.39598	67.67	37.4	-10.923	-8.932	0.91482	0.228	0.966	1152.
*214.544	7.30686	18.91	4.1	24.114	32.984	1.11035	0.234	0.891	578.
215	7.21158	19.84	4.0	24.394	33.381	1.11220	0.232	0.854	581.
220	6.44030	28.39	3.4	26.932	36.995	1.12883	0.222	0.629	611.
225	5.93006	35.17	3.1	28.940	39.870	1.14175	0.215	0.531	634.
230	5.54610	40.98	2.8	30.682	42.368	1.15274	0.210	0.473	654.
235	5.23796	46.17	2.6	32.259	44.632	1.16247	0.206	0.435	672.
240	4.98074	50.90	2.4	33.721	46.734	1.17133	0.202	0.407	689.
245	4.76019	55.29	2.3	35.101	48.716	1.17950	0.200	0.387	704.
250	4.56738	59.41	2.2	36.417	50.607	1.18714	0.197	0.370	719.
260	4.24273	67.04	2.0	38.906	54.182	1.20116	0.194	0.346	745.
270	3.97646	74.05	1.8	41.257	57.556	1.21390	0.191	0.330	770.
280	3.75158	80.61	1.7	43.511	60.787	1.22565	0.189	0.317	792.
290	3.55762	86.82	1.6	45.692	63.910	1.23661	0.187	0.308	814.
300	3.38763	92.75	1.5	47.817	66.949	1.24692	0.186	0.300	834.
320	3.10150	103.97	1.3	51.941	72.839	1.26593	0.184	0.289	871.
340	2.86788	114.57	1.2	55.946	78.546	1.28323	0.182	0.282	905.
360	2.67203	124.70	1.1	59.867	84.123	1.29917	0.182	0.276	938.
380	2.50459	134.47	1.0	63.726	89.604	1.31399	0.181	0.272	968.
400	2.35923	143.97	0.978	67.539	95.011	1.32785	0.180	0.269	997.
420	2.23150	153.24	0.920	71.315	100.359	1.34090	0.180	0.266	1025.
440	2.11813	162.32	0.869	75.062	105.661	1.35323	0.180	0.264	1052.
460	2.01666	171.26	0.824	78.785	110.924	1.36493	0.179	0.262	1077.
480	1.92518	180.06	0.783	82.489	116.155	1.37606	0.179	0.261	1102.
500	1.84220	188.75	0.747	86.177	121.360	1.38669	0.179	0.260	1126.
520	1.76652	197.35	0.714	89.852	126.542	1.39685	0.179	0.259	1150.
540	1.69717	205.86	0.684	93.516	131.704	1.40659	0.179	0.258	1173.
560	1.63334	214.30	0.657	97.170	136.851	1.41595	0.179	0.257	1195.
580	1.57437	222.68	0.632	100.816	141.983	1.42495	0.179	0.256	1217.
600	1.51970	231.00	0.608	104.456	147.104	1.43363	0.179	0.256	1238.
650	1.39892	251.59	0.558	113.535	159.866	1.45406	0.179	0.255	1289.
700	1.29652	271.94	0.515	122.598	172.588	1.47292	0.179	0.254	1337.
750	1.20848	292.10	0.478	131.659	185.290	1.49045	0.179	0.254	1384.
800	1.13193	312.11	0.447	140.729	197.988	1.50684	0.180	0.254	1428.
850	1.06469	332.00	0.419	149.822	210.696	1.52225	0.181	0.254	1471.
900	1.00514	351.79	0.395	158.946	223.427	1.53680	0.182	0.255	1512.
950	0.95200	371.50	0.374	168.111	236.191	1.55060	0.183	0.256	1552.
1000	0.90428	391.14	0.354	177.324	248.997	1.56374	0.184	0.257	1590.
1100	0.82205	430.26	0.321	195.926	274.769	1.58830	0.187	0.259	1663.
1200	0.75366	469.21	0.294	214.792	300.789	1.61094	0.190	0.262	1732.
1300	0.69587	508.03	0.271	233.951	327.089	1.63199	0.193	0.264	1798.
1400	0.64637	546.76	0.251	253.414	353.685	1.65170	0.196	0.267	1860.
1500	0.60348	585.40	0.234	273.184	380.582	1.67025	0.199	0.270	1920.
2000	0.45336	777.96	0.175	376.349	519.310	1.74998	0.213	0.284	2193.
2500	0.36316	969.92	0.140	485.356	663.826	1.81444	0.223	0.294	2435.
3000	0.30293	1161.62	0.117	598.459	812.414	1.86860	0.229	0.300	2655.
3500	0.25944	1353.21	0.100	714.401	963.830	1.91527	0.234	0.305	2858.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

400 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISCCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*114.755	54.23540	2001.37	248.6	-64.545	-63.180	0.58147	0.242	0.465	4222.
115	54.20490	1986.27	247.3	-64.432	-63.065	0.58247	0.242	0.466	4204.
120	53.56799	1712.61	223.1	-62.092	-60.709	0.60252	0.251	0.476	3881.
125	52.90214	1492.70	203.0	-59.716	-58.316	0.62206	0.252	0.481	3630.
130	52.20804	1313.10	185.9	-57.324	-55.905	0.64097	0.251	0.483	3424.
135	51.48694	1163.76	170.9	-54.924	-53.485	0.65924	0.248	0.484	3247.
140	50.73966	1037.21	157.6	-52.521	-51.061	0.67687	0.244	0.485	3091.
145	49.96721	927.89	145.7	-50.114	-48.631	0.69392	0.241	0.487	2949.
150	49.16949	831.75	134.8	-47.700	-46.194	0.71045	0.237	0.488	2816.
155	48.34571	745.81	124.9	-45.277	-43.745	0.72651	0.235	0.491	2691.
160	47.49417	667.96	115.7	-42.838	-41.278	0.74217	0.232	0.495	2570.
165	46.61222	596.66	107.2	-40.377	-38.788	0.75750	0.230	0.501	2453.
170	45.69622	530.82	99.2	-37.887	-36.266	0.77255	0.228	0.508	2338.
175	44.74135	469.61	91.7	-35.360	-33.704	0.78740	0.227	0.517	2225.
180	43.74131	412.43	84.6	-32.786	-31.092	0.80212	0.226	0.528	2113.
185	42.69778	358.73	77.8	-30.153	-28.418	0.81677	0.225	0.542	2000.
190	41.56940	308.04	71.2	-27.447	-25.665	0.83145	0.225	0.560	1886.
195	40.36988	259.88	64.8	-24.647	-22.812	0.84627	0.224	0.583	1769.
200	39.06428	213.71	58.6	-21.722	-19.825	0.86140	0.224	0.614	1647.
205	37.61093	168.91	52.3	-18.620	-16.651	0.87707	0.224	0.659	1516.
210	35.93086	124.72	45.9	-15.248	-13.187	0.89376	0.225	0.733	1372.
215	33.83848	79.92	39.9	-11.386	-9.197	0.91253	0.227	0.894	1206.
*219.374	31.15626	37.94	31.3	-7.003	-4.625	0.93357	0.232	1.313	997.
*219.374	9.06170	12.64	5.3	22.138	30.312	1.09278	0.242	1.353	572.
220	8.81859	14.32	5.1	22.711	31.110	1.09642	0.240	1.204	577.
225	7.61461	24.50	4.2	25.971	35.698	1.11706	0.227	0.744	610.
230	6.91858	32.07	3.7	28.290	38.996	1.13156	0.219	0.594	636.
235	6.42224	38.41	3.3	30.220	41.754	1.14342	0.213	0.516	657.
240	6.03577	43.99	3.1	31.928	44.200	1.15372	0.208	0.466	676.
245	5.71945	49.04	2.8	33.490	46.440	1.16297	0.204	0.432	693.
250	5.45202	53.70	2.7	34.948	48.534	1.17142	0.201	0.407	709.
260	5.01707	62.16	2.4	37.647	52.411	1.18664	0.197	0.372	738.
270	4.67186	69.79	2.2	40.149	56.004	1.20020	0.193	0.348	764.
280	4.38683	76.85	2.0	42.516	59.401	1.21255	0.191	0.332	787.
290	4.14499	83.46	1.9	44.786	62.657	1.22398	0.189	0.320	810.
300	3.93569	89.74	1.8	46.984	65.804	1.23465	0.187	0.310	830.
320	3.58818	101.52	1.6	51.221	71.864	1.25421	0.185	0.297	869.
340	3.30822	112.55	1.4	55.308	77.699	1.27190	0.183	0.287	904.
360	3.07572	123.03	1.3	59.294	83.376	1.28813	0.182	0.281	937.
380	2.87833	133.10	1.2	63.205	88.939	1.30317	0.181	0.276	968.
400	2.70790	142.85	1.1	67.060	94.414	1.31721	0.181	0.272	998.
420	2.55876	152.34	1.1	70.872	99.821	1.33040	0.180	0.269	1026.
440	2.42684	161.62	1.0	74.650	105.172	1.34285	0.180	0.266	1053.
460	2.30908	170.72	0.952	78.401	110.479	1.35464	0.180	0.264	1079.
480	2.20317	179.68	0.904	82.129	115.749	1.36586	0.179	0.263	1104.
500	2.10728	188.51	0.861	85.838	120.988	1.37655	0.179	0.261	1128.
520	2.01996	197.23	0.823	89.532	126.201	1.38678	0.179	0.260	1152.
540	1.94006	205.85	0.788	93.212	131.392	1.39657	0.179	0.259	1175.
560	1.86661	214.40	0.756	96.882	136.564	1.40598	0.179	0.258	1197.
580	1.79882	222.87	0.726	100.542	141.720	1.41502	0.179	0.257	1219.
600	1.73603	231.28	0.699	104.195	146.862	1.42374	0.179	0.257	1240.
650	1.59747	252.06	0.640	113.302	159.670	1.44424	0.179	0.256	1292.
700	1.48017	272.56	0.591	122.388	172.431	1.46316	0.179	0.255	1340.
750	1.37944	292.86	0.549	131.469	185.165	1.48073	0.180	0.255	1387.
800	1.29190	312.98	0.512	140.556	197.891	1.49715	0.180	0.255	1431.
850	1.21507	332.97	0.480	149.663	210.624	1.51259	0.181	0.255	1474.
900	1.14705	352.85	0.453	158.800	223.375	1.52717	0.182	0.255	1515.
950	1.08638	372.63	0.423	167.976	236.158	1.54099	0.183	0.256	1555.
1000	1.03192	392.34	0.406	177.200	248.981	1.55415	0.184	0.257	1593.
1100	0.93808	431.57	0.368	195.819	274.779	1.57873	0.187	0.259	1666.
1200	0.86007	470.60	0.336	214.699	300.822	1.60139	0.190	0.262	1735.
1300	0.79415	509.49	0.310	233.869	327.140	1.62246	0.193	0.265	1800.
1400	0.73769	548.27	0.287	253.342	353.752	1.64218	0.196	0.268	1863.
1500	0.68878	586.97	0.268	273.121	380.661	1.66074	0.199	0.271	1923.
2000	0.51756	779.66	0.200	376.314	519.431	1.74049	0.213	0.284	2196.
2500	0.41466	971.68	0.160	485.337	663.969	1.80496	0.223	0.294	2437.
3000	0.34594	1163.41	0.133	598.451	812.570	1.85912	0.229	0.300	2657.
3500	0.29677	1355.00	0.114	714.400	963.992	1.90580	0.234	0.305	2860.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

450 PSIA ISORAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*114.890	54.24360	2002.57	247.5	-64.527	-62.991	0.58163	0.243	0.465	4208.
115	54.23002	1995.82	246.9	-64.476	-62.940	0.58208	0.244	0.465	4200.
120	53.59710	1721.92	222.9	-62.141	-60.587	0.60210	0.252	0.475	3879.
125	52.93553	1501.81	203.0	-59.771	-58.197	0.62161	0.254	0.430	3630.
130	52.24599	1322.06	185.9	-57.385	-55.790	0.64049	0.252	0.482	3425.
135	51.52964	1172.64	171.0	-54.992	-53.374	0.65873	0.249	0.484	3250.
140	50.78766	1046.06	157.8	-52.595	-50.955	0.67633	0.245	0.484	3096.
145	50.02084	936.77	146.0	-50.196	-48.530	0.69334	0.241	0.486	2955.
150	49.22928	840.70	135.2	-47.791	-46.098	0.70983	0.238	0.437	2823.
155	48.41235	754.87	125.3	-45.377	-43.656	0.72585	0.235	0.490	2699.
160	47.56351	677.15	116.2	-42.948	-41.197	0.74146	0.233	0.494	2580.
165	46.69537	606.01	107.7	-40.499	-38.715	0.75676	0.231	0.499	2464.
170	45.78958	540.33	99.8	-38.023	-36.203	0.77173	0.229	0.506	2351.
175	44.84673	479.32	92.3	-35.512	-33.654	0.78651	0.228	0.514	2240.
180	43.86110	422.35	85.3	-32.958	-31.058	0.80114	0.227	0.525	2129.
185	42.82521	368.91	78.5	-30.349	-28.403	0.81568	0.226	0.538	2018.
190	41.72901	318.53	72.0	-27.672	-25.675	0.83023	0.225	0.554	1907.
195	40.58353	270.77	65.7	-24.909	-22.855	0.84488	0.224	0.575	1792.
200	39.29218	225.13	59.6	-22.035	-19.914	0.85977	0.224	0.603	1674.
205	37.89669	181.10	53.5	-19.007	-16.808	0.87511	0.224	0.642	1549.
210	36.31159	138.05	47.3	-15.754	-13.459	0.89125	0.225	0.703	1413.
215	34.41037	95.17	40.7	-12.125	-9.703	0.90892	0.226	0.812	1258.
220	31.82869	51.06	33.1	-7.693	-5.075	0.93018	0.230	1.095	1061.
*223.750	28.18451	14.02	24.7	-2.383	0.573	0.95561	0.239	2.516	827.
*223.750	11.59543	6.01	7.2	18.996	26.183	1.07006	0.252	2.917	567.
225	10.55770	10.48	6.4	20.989	28.832	1.08209	0.245	1.698	580.
230	8.78576	21.86	5.0	25.114	34.598	1.10725	0.230	0.858	615.
235	7.89927	29.97	4.3	27.740	38.303	1.12319	0.221	0.653	641.
240	7.27763	36.69	3.9	29.848	41.298	1.13580	0.215	0.554	663.
245	6.81259	42.55	3.5	31.677	43.909	1.14657	0.210	0.454	682.
250	6.43772	47.84	3.3	33.330	46.274	1.15613	0.206	0.454	699.
260	5.85509	57.24	2.9	36.299	50.531	1.17283	0.200	0.402	730.
270	5.41099	65.55	2.6	38.981	54.381	1.18737	0.196	0.370	758.
280	5.05378	73.13	2.4	41.480	57.968	1.20042	0.193	0.349	783.
290	4.75626	80.17	2.2	43.851	61.371	1.21236	0.190	0.333	806.
300	4.50225	86.79	2.0	46.129	64.638	1.22343	0.189	0.321	828.
320	4.08659	99.14	1.8	50.487	70.878	1.24358	0.186	0.304	867.
340	3.75639	110.60	1.6	54.663	76.846	1.26167	0.184	0.293	904.
360	3.48481	121.43	1.5	58.716	82.628	1.27820	0.183	0.285	937.
380	3.25586	131.79	1.4	62.680	88.274	1.29346	0.182	0.230	969.
400	3.05923	141.79	1.3	66.580	93.819	1.30768	0.181	0.275	999.
420	2.88790	151.50	1.2	70.429	99.284	1.32102	0.181	0.272	1027.
440	2.73685	160.96	1.1	74.239	104.686	1.33358	0.180	0.269	1055.
460	2.60239	170.23	1.1	78.016	110.037	1.34548	0.180	0.266	1081.
480	2.48172	179.34	1.0	81.768	115.346	1.35677	0.180	0.265	1106.
500	2.37267	188.30	0.978	85.499	120.620	1.36754	0.179	0.263	1131.
520	2.27354	197.14	0.933	89.211	125.864	1.37782	0.179	0.262	1154.
540	2.18294	205.88	0.893	92.909	131.083	1.38767	0.179	0.260	1177.
560	2.09975	214.52	0.856	96.594	136.280	1.39712	0.179	0.259	1200.
580	2.02306	223.09	0.822	100.269	141.459	1.40621	0.179	0.259	1222.
600	1.95208	231.58	0.791	103.934	146.622	1.41496	0.179	0.258	1243.
650	1.79565	252.55	0.724	113.070	159.477	1.43554	0.179	0.256	1295.
700	1.66340	273.21	0.667	122.179	172.276	1.45451	0.179	0.256	1343.
750	1.54994	293.64	0.619	131.279	185.043	1.47213	0.180	0.255	1390.
800	1.45143	313.88	0.578	140.383	197.796	1.48859	0.180	0.255	1435.
850	1.36501	333.96	0.542	149.505	210.552	1.50406	0.181	0.255	1477.
900	1.28854	353.92	0.510	158.654	223.325	1.51866	0.182	0.256	1518.
950	1.22036	373.78	0.482	167.842	236.126	1.53250	0.183	0.256	1558.
1000	1.15916	393.55	0.457	177.076	248.965	1.54567	0.184	0.257	1596.
1100	1.05376	432.88	0.414	195.712	274.791	1.57028	0.187	0.259	1669.
1200	0.96616	472.00	0.379	214.606	300.856	1.59296	0.190	0.262	1738.
1300	0.89215	510.96	0.349	233.788	327.192	1.61404	0.193	0.265	1803.
1400	0.82876	549.80	0.324	253.271	353.819	1.63377	0.196	0.268	1866.
1500	0.77385	588.54	0.302	273.058	380.741	1.65234	0.199	0.271	1926.
2000	0.58162	781.36	0.225	376.280	519.553	1.73212	0.213	0.284	2198.
2500	0.46607	973.44	0.180	485.319	664.112	1.79659	0.223	0.294	2439.
3000	0.38888	1165.19	0.150	598.443	812.725	1.85077	0.229	0.300	2659.
3500	0.33365	1356.79	0.129	714.398	964.155	1.89744	0.234	0.305	2862.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

500 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*115.025	54.25189	2003.81	246.4	-64.508	-62.802	0.58179	0.245	0.454	4194.
120	53.62606	1731.22	222.7	-62.190	-60.464	0.60169	0.253	0.474	3878.
125	52.96873	1510.92	202.9	-59.826	-58.078	0.62117	0.255	0.479	3630.
130	52.28368	1331.02	185.9	-57.445	-55.674	0.64002	0.253	0.432	3427.
135	51.57212	1181.50	171.2	-55.059	-53.263	0.65822	0.250	0.433	3254.
140	50.83526	1054.89	158.1	-52.669	-50.848	0.67579	0.246	0.433	3100.
145	50.07396	945.62	146.3	-50.277	-48.428	0.69277	0.242	0.434	2960.
150	49.28844	849.61	135.6	-47.881	-46.002	0.70922	0.239	0.436	2831.
155	48.47819	763.88	125.7	-45.475	-43.566	0.72520	0.236	0.439	2708.
160	47.64196	686.29	116.7	-43.057	-41.114	0.74077	0.233	0.432	2590.
165	46.77725	615.29	108.3	-40.620	-38.640	0.75599	0.231	0.437	2476.
170	45.88132	549.78	100.4	-38.157	-36.135	0.77092	0.230	0.504	2364.
175	44.95001	488.95	93.0	-35.662	-33.602	0.78563	0.228	0.512	2254.
180	43.97813	432.18	85.9	-33.125	-31.020	0.80018	0.227	0.521	2145.
185	42.95893	378.97	79.3	-30.539	-28.383	0.81462	0.226	0.534	2036.
190	41.88348	328.87	72.8	-27.889	-25.679	0.82905	0.225	0.549	1927.
195	40.73944	281.47	66.6	-25.162	-22.889	0.84354	0.225	0.568	1815.
200	39.50892	236.31	60.6	-22.333	-19.990	0.85822	0.224	0.593	1701.
205	38.16410	192.93	54.6	-19.370	-16.944	0.87326	0.224	0.627	1581.
210	36.65789	150.82	48.6	-16.216	-13.690	0.88894	0.225	0.678	1452.
215	34.89967	109.38	42.4	-12.763	-10.110	0.90578	0.226	0.752	1308.
220	32.67270	67.88	35.5	-8.757	-5.923	0.92503	0.228	0.938	1137.
225	29.11015	24.97	26.8	-3.194	-0.013	0.95156	0.235	1.645	899.
230	12.11676	9.39	7.5	19.737	27.378	1.07188	0.247	1.993	592.
235	5.87963	20.69	5.7	24.472	33.844	1.09973	0.232	0.942	624.
240	8.80650	28.96	4.9	27.340	37.854	1.11663	0.222	0.699	649.
245	8.09080	35.84	4.4	29.593	41.037	1.12975	0.216	0.585	671.
250	7.55388	41.87	4.0	31.524	43.781	1.14085	0.211	0.518	690.
260	6.76865	52.30	3.4	34.845	48.524	1.15946	0.204	0.440	723.
270	6.19941	61.34	3.0	37.747	52.682	1.17516	0.198	0.396	753.
280	5.75530	69.46	2.8	40.399	56.487	1.18899	0.195	0.367	779.
290	5.39292	76.94	2.5	42.884	60.053	1.20151	0.192	0.347	803.
300	5.08812	83.92	2.4	45.251	63.449	1.21302	0.190	0.333	825.
320	4.59695	96.83	2.1	49.740	69.882	1.23379	0.187	0.312	866.
340	4.21238	108.72	1.9	54.009	75.990	1.25231	0.185	0.299	903.
360	3.89920	119.90	1.7	58.133	81.878	1.26914	0.183	0.290	938.
380	3.63706	130.55	1.6	62.153	87.610	1.28464	0.182	0.233	970.
400	3.41313	140.79	1.5	66.098	93.225	1.29904	0.182	0.278	1000.
420	3.21882	150.71	1.4	69.985	98.750	1.31252	0.181	0.274	1029.
440	3.04807	160.36	1.3	73.826	104.203	1.32520	0.181	0.271	1056.
460	2.89649	169.79	1.2	77.632	109.598	1.33719	0.180	0.268	1083.
480	2.76076	179.04	1.2	81.408	114.546	1.34857	0.180	0.266	1108.
500	2.63833	188.13	1.1	85.160	120.254	1.35941	0.180	0.265	1133.
520	2.52720	197.10	1.0	88.892	125.529	1.36975	0.179	0.263	1157.
540	2.42577	205.94	0.999	92.607	130.776	1.37965	0.179	0.262	1180.
560	2.33274	214.68	0.957	96.307	135.998	1.38915	0.179	0.261	1203.
580	2.24706	223.34	0.919	99.996	141.201	1.39828	0.179	0.260	1225.
600	2.16783	231.92	0.884	103.675	146.385	1.40707	0.179	0.259	1246.
650	1.99343	253.07	0.808	112.838	159.285	1.42772	0.179	0.257	1296.
700	1.84618	273.88	0.744	121.971	172.122	1.44675	0.179	0.256	1347.
750	1.71999	294.44	0.690	131.090	184.921	1.46441	0.180	0.256	1393.
800	1.61050	314.78	0.644	140.211	197.702	1.48090	0.180	0.256	1438.
850	1.51451	334.96	0.604	149.347	210.482	1.49640	0.181	0.256	1480.
900	1.42960	355.01	0.568	158.510	223.275	1.51103	0.182	0.256	1522.
950	1.35392	374.93	0.537	167.708	236.094	1.52439	0.183	0.257	1561.
1000	1.28601	394.77	0.509	176.952	248.950	1.53807	0.184	0.258	1599.
1100	1.16909	434.21	0.461	195.605	274.803	1.56271	0.187	0.260	1672.
1200	1.07193	473.41	0.421	214.514	300.890	1.58541	0.190	0.262	1741.
1300	0.98986	512.44	0.388	233.707	327.245	1.60650	0.193	0.265	1806.
1400	0.91958	551.33	0.360	253.199	353.886	1.62625	0.196	0.268	1869.
1500	0.85869	590.12	0.335	272.995	380.821	1.64483	0.199	0.271	1929.
2000	0.64554	783.07	0.251	376.245	519.674	1.72463	0.213	0.234	2201.
2500	0.51739	975.20	0.200	485.300	664.255	1.78911	0.223	0.234	2442.
3000	0.43176	1166.98	0.167	598.434	812.881	1.84329	0.229	0.300	2661.
3500	0.37047	1358.58	0.143	714.396	964.318	1.88997	0.234	0.305	2864.

* INDICATES TWO PHASE BOUNDARY

550 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE	DENSITY	ISOTHERM	ISCCHORE	INTERNAL	ENTHALPY	ENTROPY	CV	CP	VELOCITY
DEG R	LB/ CU FT	DERIVATIVE	DERIVATIVE	ENERGY					OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LU	BTU/LU	BTU/LB-R	BTU / LB - R		FT/SEC
*115.160	54.26026	2005.10	245.4	-64.490	-62.613	0.58195	0.247	0.464	4181.
120	53.65487	1740.53	222.5	-62.239	-60.341	0.60127	0.254	0.474	3876.
125	53.00172	1520.01	202.8	-59.880	-57.958	0.62073	0.256	0.479	3631.
130	52.32112	1339.96	186.0	-57.505	-55.559	0.63955	0.254	0.481	3429.
135	51.61428	1190.35	171.3	-55.125	-53.152	0.65772	0.251	0.492	3257.
140	50.88246	1063.70	159.3	-52.742	-50.741	0.67525	0.247	0.493	3105.
145	50.12659	954.45	146.6	-50.358	-48.326	0.69220	0.243	0.493	2966.
150	49.34699	858.49	135.9	-47.969	-45.905	0.70861	0.240	0.485	2838.
155	48.54326	772.86	126.1	-45.573	-43.475	0.72455	0.237	0.497	2716.
160	47.71423	695.38	117.1	-43.164	-41.030	0.74008	0.234	0.491	2600.
165	46.85791	624.52	108.8	-40.738	-38.565	0.75525	0.232	0.495	2487.
170	45.97150	559.17	100.9	-38.288	-36.073	0.77012	0.230	0.501	2376.
175	45.05128	498.50	93.6	-35.808	-33.547	0.78477	0.229	0.509	2268.
180	44.09253	441.92	86.6	-33.289	-30.979	0.79923	0.227	0.518	2161.
185	43.08916	388.92	80.0	-30.724	-28.360	0.81359	0.226	0.530	2054.
190	42.03319	339.08	73.6	-28.100	-25.677	0.82789	0.226	0.544	1946.
195	40.91383	292.00	67.5	-25.405	-22.915	0.84224	0.225	0.561	1838.
200	39.71573	247.26	61.5	-22.618	-20.054	0.85673	0.225	0.534	1726.
205	38.61579	204.44	55.7	-19.713	-17.062	0.87150	0.224	0.614	1610.
210	36.97653	163.11	49.8	-16.643	-13.889	0.88679	0.225	0.658	1497.
215	35.33063	122.81	43.9	-13.329	-10.446	0.90299	0.225	0.725	1353.
220	33.33638	83.09	37.5	-9.604	-6.545	0.92091	0.227	0.848	1195.
225	30.59250	43.62	30.2	-5.003	-1.674	0.94280	0.231	1.162	1008.
230	24.36685	6.87	18.8	3.617	7.797	0.98435	0.247	3.919	711.
235	13.16587	10.86	8.3	19.376	27.112	1.06759	0.245	1.824	612.
240	10.82713	20.95	6.4	24.132	33.539	1.09468	0.232	0.972	638.
245	9.63973	29.00	5.5	27.127	37.693	1.11182	0.223	0.725	661.
250	8.84323	35.85	4.9	29.475	40.992	1.12515	0.216	0.606	682.
260	7.77250	47.40	4.1	33.269	46.373	1.14627	0.207	0.486	717.
270	7.04345	57.20	3.6	36.441	50.901	1.16337	0.201	0.425	748.
280	6.49439	65.88	3.2	39.271	54.954	1.17811	0.197	0.388	775.
290	6.05650	73.80	2.9	41.885	58.702	1.19127	0.194	0.363	800.
300	5.69406	81.14	2.7	44.350	62.237	1.20325	0.191	0.345	823.
320	5.11937	94.61	2.4	48.981	68.876	1.22468	0.188	0.321	865.
340	4.67614	106.93	2.1	53.349	75.129	1.24364	0.186	0.306	903.
360	4.31878	118.45	1.9	57.545	81.128	1.26079	0.184	0.295	938.
380	4.02180	129.38	1.8	61.623	86.947	1.27653	0.183	0.237	971.
400	3.76947	139.85	1.6	65.614	92.634	1.29111	0.182	0.292	1001.
420	3.55141	149.97	1.5	69.540	98.218	1.30473	0.181	0.277	1030.
440	3.36042	159.80	1.4	73.414	103.722	1.31754	0.181	0.273	1058.
460	3.19132	169.40	1.4	77.248	109.162	1.32963	0.180	0.271	1085.
480	3.04023	178.79	1.3	81.048	114.549	1.34109	0.180	0.268	1111.
500	2.90419	188.01	1.2	84.822	119.891	1.35200	0.180	0.266	1135.
520	2.78089	197.09	1.2	88.573	125.197	1.36240	0.180	0.264	1159.
540	2.66850	206.04	1.1	92.305	130.472	1.37235	0.180	0.263	1183.
560	2.56554	214.88	1.1	96.021	135.720	1.38190	0.179	0.262	1205.
580	2.47079	223.62	1.0	99.724	140.945	1.39107	0.179	0.261	1227.
600	2.38326	232.28	0.978	103.416	146.150	1.39989	0.179	0.260	1249.
650	2.19080	253.61	0.893	112.607	159.096	1.42061	0.179	0.258	1301.
700	2.02852	274.57	0.822	121.763	171.971	1.43970	0.179	0.257	1350.
750	1.88957	295.25	0.762	130.902	184.802	1.45740	0.180	0.256	1396.
800	1.76911	315.71	0.710	140.040	197.610	1.47394	0.180	0.256	1441.
850	1.66355	335.98	0.666	149.190	210.414	1.48946	0.181	0.256	1484.
900	1.57023	356.10	0.626	158.365	223.227	1.50411	0.182	0.256	1525.
950	1.48707	376.10	0.592	167.575	236.054	1.51797	0.183	0.257	1564.
1000	1.41247	396.00	0.560	176.829	248.935	1.53119	0.184	0.258	1603.
1100	1.28407	435.54	0.507	195.499	274.816	1.55586	0.187	0.260	1675.
1200	1.17739	474.83	0.464	214.421	300.925	1.57857	0.190	0.262	1744.
1300	1.08729	513.32	0.427	233.626	327.297	1.59968	0.193	0.265	1805.
1400	1.01014	552.87	0.396	253.128	353.954	1.61944	0.196	0.268	1872.
1500	0.94331	591.70	0.369	272.933	380.902	1.63803	0.199	0.271	1932.
2000	0.70932	784.79	0.276	376.211	519.796	1.71785	0.213	0.284	2203.
2500	0.56861	976.97	0.220	485.282	664.399	1.78234	0.223	0.294	2444.
3000	0.47457	1168.77	0.183	598.426	813.037	1.83653	0.229	0.300	2663.
3500	0.40725	1360.37	0.157	714.395	964.482	1.88321	0.234	0.305	2866.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

600 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*115.295	54.26972	2006.44	244.3	-64.471	-62.424	0.58211	0.248	0.464	4168.
120	53.68352	1749.83	222.3	-62.287	-60.217	0.60086	0.255	0.473	3875.
125	53.03452	1529.11	202.7	-59.933	-57.838	0.62029	0.257	0.478	3631.
130	52.35831	1348.89	186.0	-57.565	-55.443	0.63908	0.255	0.480	3431.
135	51.65613	1199.18	171.4	-55.190	-53.040	0.65722	0.251	0.481	3260.
140	50.92928	1072.49	158.5	-52.814	-50.633	0.67472	0.248	0.482	3109.
145	50.17874	963.24	146.8	-50.437	-48.223	0.69164	0.244	0.492	2972.
150	49.40493	867.34	136.3	-48.056	-45.807	0.70801	0.240	0.484	2845.
155	48.60759	781.79	126.6	-45.669	-43.383	0.72391	0.237	0.486	2724.
160	47.78567	704.43	117.6	-43.270	-40.945	0.73940	0.235	0.489	2609.
165	46.93739	633.70	109.3	-40.855	-38.498	0.75452	0.232	0.494	2498.
170	46.06018	568.49	101.5	-38.417	-36.005	0.76934	0.231	0.499	2389.
175	45.15064	507.99	94.2	-35.951	-33.490	0.78392	0.229	0.507	2282.
180	44.20446	451.58	87.3	-33.450	-30.936	0.79831	0.228	0.515	2176.
185	43.21612	398.78	80.7	-30.904	-28.333	0.81257	0.227	0.526	2071.
190	42.17850	349.17	74.4	-28.305	-25.671	0.82677	0.226	0.539	1965.
195	41.08209	302.37	68.3	-25.640	-22.935	0.84098	0.225	0.556	1859.
200	39.91367	258.00	62.4	-22.892	-20.108	0.85529	0.225	0.576	1751.
205	38.65386	215.67	55.7	-20.038	-17.163	0.86984	0.224	0.603	1638.
210	37.27237	175.00	51.0	-17.041	-14.060	0.88479	0.225	0.640	1521.
215	35.71778	135.61	45.2	-13.840	-10.730	0.90046	0.225	0.696	1394.
220	33.89163	97.22	39.3	-10.320	-7.042	0.91741	0.226	0.788	1253.
225	31.56486	59.77	32.7	-6.215	-2.695	0.93694	0.229	0.977	1087.
230	27.95726	24.56	24.7	-0.629	3.345	0.96347	0.236	1.585	875.
235	19.66922	7.09	13.7	10.521	16.170	1.01855	0.252	3.221	648.
240	13.78587	13.71	9.7	19.685	27.744	1.06736	0.242	1.532	634.
245	11.59906	22.40	6.9	24.105	33.684	1.09187	0.231	0.953	655.
250	10.36763	29.98	6.0	27.110	37.827	1.10862	0.222	0.732	676.
260	8.88467	42.62	4.8	31.550	44.055	1.13307	0.211	0.544	713.
270	7.95007	53.17	4.1	35.054	49.029	1.15185	0.204	0.460	745.
280	7.27414	62.42	3.7	38.093	53.367	1.16763	0.199	0.412	773.
290	6.74844	70.77	3.3	40.852	57.316	1.18150	0.196	0.380	798.
300	6.32072	78.47	3.1	43.426	61.004	1.19400	0.193	0.358	822.
320	5.65394	92.48	2.7	48.209	67.860	1.21613	0.189	0.330	865.
340	5.14755	105.22	2.4	52.681	74.265	1.23555	0.186	0.312	904.
360	4.74342	117.07	2.1	56.954	80.377	1.25303	0.185	0.300	939.
380	4.40995	128.27	2.0	61.091	86.286	1.26900	0.183	0.291	972.
400	4.12812	138.98	1.8	65.130	92.044	1.28377	0.182	0.285	1003.
420	3.88556	149.30	1.7	69.094	97.689	1.29754	0.182	0.280	1032.
440	3.67380	159.31	1.6	73.002	103.245	1.31046	0.181	0.276	1060.
460	3.48679	169.05	1.5	76.864	108.729	1.32265	0.181	0.273	1087.
480	3.32005	178.58	1.4	80.689	114.154	1.33420	0.180	0.270	1113.
500	3.17019	187.93	1.3	84.484	119.532	1.34518	0.180	0.268	1138.
520	3.03457	197.12	1.3	88.254	124.868	1.35564	0.180	0.266	1162.
540	2.91110	206.17	1.2	92.004	130.171	1.36565	0.180	0.264	1185.
560	2.79811	215.10	1.2	95.736	135.444	1.37524	0.180	0.263	1208.
580	2.69423	223.93	1.1	99.453	140.692	1.38444	0.179	0.262	1230.
600	2.59934	232.67	1.1	103.157	145.918	1.39330	0.179	0.261	1252.
650	2.38773	254.17	0.978	112.377	158.909	1.41410	0.179	0.259	1304.
700	2.21038	275.28	0.900	121.556	171.822	1.43324	0.180	0.258	1353.
750	2.05868	296.09	0.834	130.714	184.684	1.45099	0.180	0.257	1399.
800	1.92725	316.65	0.777	139.869	197.520	1.46756	0.180	0.257	1444.
850	1.81214	337.01	0.728	149.034	210.346	1.48311	0.181	0.257	1487.
900	1.71042	357.21	0.685	158.221	223.180	1.49778	0.182	0.257	1528.
950	1.61981	377.28	0.646	167.442	236.035	1.51168	0.183	0.257	1568.
1000	1.53854	397.24	0.612	176.706	248.922	1.52490	0.184	0.258	1606.
1100	1.39869	436.89	0.554	195.393	274.829	1.54959	0.187	0.260	1679.
1200	1.28253	476.25	0.506	214.329	300.960	1.57233	0.190	0.263	1747.
1300	1.18444	515.41	0.466	233.545	327.351	1.59345	0.193	0.265	1812.
1400	1.10045	554.41	0.432	253.057	354.022	1.61321	0.196	0.268	1875.
1500	1.02770	593.28	0.403	272.870	380.983	1.63181	0.199	0.271	1934.
2000	0.77296	786.50	0.301	376.176	519.918	1.71166	0.213	0.284	2206.
2500	0.61975	978.74	0.240	485.264	664.542	1.77616	0.223	0.294	2446.
3000	0.51732	1170.56	0.200	598.417	813.192	1.83035	0.229	0.300	2665.
3500	0.44398	1362.17	0.171	714.393	964.645	1.87703	0.234	0.305	2868.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

650 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*115.430	54.27725	2007.82	243.3	-64.452	-62.235	0.58227	0.250	0.464	4155.
120	53.71201	1759.13	222.0	-62.335	-60.094	0.60046	0.257	0.472	3874.
125	53.06712	1538.19	202.6	-59.986	-57.718	0.61985	0.258	0.477	3632.
130	52.39526	1357.82	186.0	-57.623	-55.326	0.63862	0.256	0.479	3433.
135	51.69767	1208.00	171.5	-55.255	-52.927	0.65672	0.252	0.430	3263.
140	50.97571	1081.25	153.7	-52.866	-50.525	0.67420	0.248	0.431	3114.
145	50.23041	972.01	147.1	-50.516	-48.119	0.69108	0.245	0.431	2978.
150	49.46229	876.15	136.6	-48.143	-45.709	0.70742	0.241	0.433	2852.
155	48.67118	790.69	127.0	-45.763	-43.290	0.72328	0.238	0.435	2733.
160	47.85620	713.43	118.1	-43.374	-40.859	0.73872	0.235	0.438	2619.
165	47.01573	642.83	109.8	-40.969	-38.409	0.75380	0.233	0.432	2508.
170	46.14742	577.75	102.1	-38.544	-35.936	0.76857	0.231	0.458	2401.
175	45.24817	517.40	94.8	-36.092	-33.432	0.78308	0.229	0.534	2295.
180	44.31402	461.15	87.9	-33.606	-30.890	0.79740	0.228	0.513	2191.
185	43.33999	408.54	81.4	-31.080	-28.303	0.81158	0.227	0.523	2087.
190	42.31968	359.14	75.1	-28.504	-25.659	0.82568	0.226	0.535	1984.
195	41.26470	312.60	69.1	-25.867	-22.948	0.83976	0.225	0.550	1880.
200	40.10360	268.56	63.3	-23.154	-20.153	0.85391	0.225	0.569	1774.
205	38.87996	226.65	57.7	-20.347	-17.251	0.86824	0.225	0.593	1665.
210	37.54902	186.54	52.1	-17.414	-14.209	0.88290	0.224	0.626	1552.
215	36.07060	147.92	46.5	-14.309	-10.972	0.89814	0.225	0.672	1432.
220	34.37329	110.56	40.8	-10.947	-7.445	0.91435	0.226	0.745	1300.
225	32.31155	74.50	34.7	-7.159	-3.434	0.93237	0.227	0.874	1152.
230	29.51589	40.68	27.9	-2.521	1.557	0.95430	0.231	1.169	976.
235	24.76598	15.03	19.5	4.366	9.226	0.98725	0.241	2.039	767.
240	18.04146	11.06	12.2	13.846	20.518	1.03480	0.247	2.094	659.
245	14.16784	17.16	9.0	20.336	28.832	1.06911	0.238	1.293	657.
250	12.20786	24.70	7.3	24.345	34.205	1.09083	0.229	0.908	674.
260	10.12576	38.10	5.7	29.666	41.554	1.11969	0.216	0.616	710.
270	8.92656	49.32	4.8	33.580	47.064	1.14050	0.207	0.530	742.
280	8.09752	59.09	4.2	36.861	51.726	1.15746	0.202	0.438	771.
290	7.47001	67.87	3.8	39.785	55.898	1.17211	0.197	0.399	797.
300	6.96865	75.91	3.4	42.477	59.750	1.18517	0.194	0.373	821.
320	6.20063	90.46	3.0	47.424	66.836	1.20805	0.190	0.339	865.
340	5.62648	103.60	2.6	52.006	73.399	1.22795	0.187	0.319	904.
360	5.17292	115.77	2.4	56.359	79.627	1.24575	0.185	0.305	940.
380	4.80134	127.24	2.2	60.557	85.626	1.26197	0.184	0.295	973.
400	4.48895	138.17	2.0	64.644	91.456	1.27693	0.183	0.288	1005.
420	4.22116	148.69	1.9	68.648	97.163	1.29085	0.182	0.283	1034.
440	3.98811	158.86	1.7	72.589	102.770	1.30389	0.181	0.278	1063.
460	3.78282	168.76	1.6	76.480	108.299	1.31618	0.181	0.275	1090.
480	3.60017	178.42	1.5	80.330	113.764	1.32781	0.181	0.272	1116.
500	3.43628	187.89	1.5	84.147	119.175	1.33885	0.180	0.269	1141.
520	3.28818	197.19	1.4	87.937	124.542	1.34938	0.180	0.267	1165.
540	3.15352	206.34	1.3	91.704	129.872	1.35944	0.180	0.266	1188.
560	3.03042	215.37	1.3	95.451	135.170	1.36907	0.180	0.264	1211.
580	2.91734	224.28	1.2	99.182	140.441	1.37832	0.180	0.263	1233.
600	2.81304	233.09	1.2	102.900	145.688	1.38721	0.180	0.262	1255.
650	2.58422	254.77	1.1	112.147	158.725	1.40808	0.180	0.260	1307.
700	2.39177	276.02	0.979	121.349	171.674	1.42728	0.180	0.258	1356.
750	2.22731	296.94	0.906	130.527	184.568	1.44507	0.180	0.257	1403.
800	2.08491	317.60	0.844	139.698	197.430	1.46167	0.181	0.257	1447.
850	1.96028	338.06	0.790	148.878	210.280	1.47725	0.181	0.257	1490.
900	1.85017	358.34	0.743	158.078	223.135	1.49195	0.182	0.257	1531.
950	1.75212	378.48	0.702	167.310	236.007	1.50587	0.183	0.258	1571.
1000	1.66421	398.49	0.665	176.584	248.910	1.51910	0.184	0.258	1609.
1100	1.51296	438.24	0.601	195.287	274.844	1.54382	0.187	0.260	1682.
1200	1.38736	477.68	0.549	214.237	300.996	1.56657	0.190	0.263	1750.
1300	1.28131	516.91	0.506	233.465	327.405	1.58771	0.193	0.265	1815.
1400	1.19051	555.96	0.469	252.987	354.091	1.60749	0.196	0.268	1877.
1500	1.11186	594.88	0.437	272.808	381.064	1.62609	0.199	0.271	1937.
2000	0.83647	788.22	0.326	376.142	520.040	1.70597	0.213	0.284	2208.
2500	0.67079	980.52	0.260	485.245	664.686	1.77048	0.223	0.294	2448.
3000	0.56000	1172.35	0.217	598.409	813.348	1.82467	0.229	0.300	2667.
3500	0.46066	1363.97	0.186	714.392	964.808	1.87136	0.234	0.305	2870.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

700 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*115.565	54.28586	2009.24	242.2	-64.433	-62.046	0.58243	0.251	0.463	4143.
120	53.74036	1768.42	221.8	-62.382	-59.970	0.60005	0.258	0.472	3873.
125	53.09953	1547.27	202.5	-60.039	-57.598	0.61942	0.259	0.476	3637.
130	52.43196	1366.73	186.0	-57.682	-55.209	0.63816	0.257	0.479	3435.
135	51.73891	1216.80	171.6	-55.320	-52.814	0.65623	0.253	0.479	3267.
140	51.02176	1090.00	158.9	-52.957	-50.416	0.67368	0.249	0.480	3118.
145	50.28162	980.75	147.4	-50.593	-48.015	0.69053	0.245	0.481	2984.
150	49.51907	884.94	136.9	-48.223	-45.610	0.70683	0.242	0.482	2859.
155	48.73407	799.54	127.4	-45.857	-43.197	0.72266	0.238	0.484	2741.
160	47.92585	722.39	118.5	-43.477	-40.772	0.73806	0.236	0.487	2628.
165	47.09297	651.90	110.3	-41.082	-38.330	0.75309	0.233	0.491	2519.
170	46.23328	586.96	102.6	-38.669	-35.865	0.76780	0.232	0.496	2413.
175	45.34394	526.74	95.4	-36.230	-33.371	0.78226	0.230	0.502	2309.
180	44.42134	470.65	88.5	-33.760	-30.842	0.79651	0.229	0.510	2206.
185	43.46095	418.20	82.1	-31.252	-28.269	0.81061	0.227	0.519	2104.
190	42.45702	369.01	75.9	-28.697	-25.644	0.82461	0.226	0.531	2002.
195	41.40212	322.70	69.9	-26.087	-22.956	0.83857	0.226	0.545	1900.
200	40.28626	278.95	64.2	-23.407	-20.190	0.85258	0.225	0.562	1797.
205	39.09547	237.42	58.6	-20.642	-17.327	0.86672	0.225	0.584	1691.
210	37.80925	197.79	53.1	-17.766	-14.338	0.88112	0.224	0.613	1582.
215	36.39566	159.80	47.7	-14.742	-11.181	0.89598	0.225	0.652	1467.
220	34.80121	123.27	42.2	-11.507	-7.782	0.91160	0.225	0.711	1343.
225	32.92692	88.25	36.5	-7.945	-4.008	0.92856	0.226	0.807	1207.
230	30.56226	55.46	30.4	-3.816	0.426	0.94804	0.229	0.988	1053.
235	27.18617	27.90	23.4	1.475	6.243	0.97305	0.235	1.335	877.
240	22.08786	14.68	16.2	8.787	14.655	1.00845	0.243	1.890	725.
245	17.31802	15.34	11.6	16.018	23.503	1.04495	0.242	1.566	676.
250	14.42235	20.91	9.1	21.156	30.144	1.07180	0.234	1.118	680.
260	11.51528	34.05	6.7	27.605	38.862	1.10604	0.220	0.703	710.
270	9.97956	45.74	5.5	32.014	45.003	1.12924	0.211	0.566	742.
280	8.96709	55.97	4.8	35.576	50.032	1.14753	0.204	0.467	771.
290	8.22221	65.13	4.2	38.682	54.447	1.16303	0.199	0.420	797.
300	7.63815	73.49	3.9	41.505	58.476	1.17669	0.196	0.388	822.
320	6.75932	88.56	3.3	46.628	65.805	1.20036	0.191	0.349	866.
340	6.11272	102.08	2.9	51.324	72.530	1.22075	0.188	0.326	905.
360	5.60710	114.56	2.6	55.760	78.878	1.23889	0.186	0.310	942.
380	5.19580	125.29	2.4	60.020	84.968	1.25536	0.184	0.299	975.
400	4.85179	137.44	2.2	64.157	90.874	1.27051	0.183	0.292	1007.
420	4.55807	148.14	2.0	68.202	96.641	1.28458	0.182	0.295	1037.
440	4.30325	158.47	1.9	72.177	102.300	1.29774	0.182	0.291	1065.
460	4.07933	168.51	1.8	76.097	107.873	1.31013	0.181	0.277	1092.
480	3.88050	178.31	1.7	79.972	113.376	1.32184	0.181	0.274	1113.
500	3.70240	187.89	1.6	83.811	118.822	1.33296	0.180	0.271	1143.
520	3.54168	197.30	1.5	87.620	124.220	1.34354	0.180	0.269	1168.
540	3.39572	206.55	1.4	91.404	129.577	1.35365	0.180	0.267	1191.
560	3.26242	215.66	1.4	95.167	134.900	1.36333	0.180	0.265	1214.
580	3.14010	224.66	1.3	98.913	140.193	1.37262	0.180	0.264	1236.
600	3.02734	233.55	1.3	102.643	145.461	1.38155	0.180	0.263	1258.
650	2.78025	255.38	1.2	111.918	158.542	1.40249	0.180	0.261	1310.
700	2.57267	276.77	1.1	121.144	171.529	1.42174	0.180	0.259	1359.
750	2.39545	297.81	0.979	130.341	184.454	1.43958	0.180	0.258	1406.
800	2.24210	318.58	0.912	139.529	197.343	1.45621	0.181	0.258	1451.
850	2.10795	339.12	0.853	148.722	210.216	1.47182	0.181	0.257	1493.
900	1.98948	359.48	0.802	157.935	223.090	1.48654	0.182	0.258	1534.
950	1.88402	379.68	0.757	167.178	235.980	1.50048	0.183	0.258	1574.
1000	1.78949	399.76	0.717	176.462	248.899	1.51373	0.184	0.259	1612.
1100	1.62688	439.60	0.648	195.182	274.859	1.53847	0.187	0.261	1695.
1200	1.49188	479.12	0.592	214.146	301.033	1.56124	0.190	0.263	1753.
1300	1.37790	518.41	0.545	233.395	327.459	1.58239	0.193	0.266	1818.
1400	1.28032	557.51	0.505	252.916	354.160	1.60218	0.196	0.268	1880.
1500	1.19580	596.47	0.470	272.745	381.146	1.62080	0.199	0.271	1940.
2000	0.89983	789.95	0.351	376.108	520.163	1.70069	0.213	0.294	2211.
2500	0.72173	982.29	0.280	485.227	664.829	1.76522	0.223	0.294	2451.
3000	0.60262	1174.15	0.233	598.401	813.504	1.81941	0.229	0.300	2669.
3500	0.51730	1365.77	0.200	714.390	964.971	1.86610	0.234	0.305	2871.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

750 PSIA ISODAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*115.700	54.29455	2010.71	241.2	-64.414	-61.856	0.58259	0.253	0.463	4131.
120	53.76856	1777.72	221.6	-62.429	-59.846	0.59965	0.259	0.471	3872.
125	53.13175	1556.35	202.4	-60.091	-57.477	0.61899	0.260	0.476	3633.
130	52.46843	1375.63	186.0	-57.739	-55.092	0.63770	0.258	0.478	3437.
135	51.77986	1225.59	171.8	-55.383	-52.701	0.65575	0.254	0.479	3270.
140	51.06745	1098.72	159.1	-53.026	-50.307	0.67316	0.250	0.479	3123.
145	50.33237	989.47	147.7	-50.670	-47.911	0.68998	0.246	0.480	2989.
150	49.57530	893.69	137.3	-48.312	-45.510	0.70625	0.242	0.491	2866.
155	48.79626	808.36	127.7	-45.949	-43.103	0.72204	0.239	0.482	2749.
160	47.99464	731.30	119.0	-43.578	-40.684	0.73740	0.236	0.485	2637.
165	47.16914	660.93	110.8	-41.194	-38.249	0.75238	0.234	0.489	2530.
170	46.31781	596.11	103.1	-38.791	-35.793	0.76705	0.232	0.494	2425.
175	45.43304	536.03	96.0	-36.365	-33.309	0.78145	0.230	0.500	2322.
180	44.52653	480.08	89.2	-33.910	-30.791	0.79564	0.229	0.507	2220.
185	43.57916	427.79	82.7	-31.419	-28.233	0.80966	0.228	0.516	2120.
190	42.59076	378.77	76.6	-28.886	-25.625	0.82356	0.227	0.527	2020.
195	41.55471	332.68	70.7	-26.300	-22.958	0.83742	0.226	0.540	1920.
200	40.46228	289.18	65.0	-23.651	-20.219	0.85129	0.225	0.556	1818.
205	39.30151	247.98	59.5	-20.925	-17.391	0.86525	0.225	0.576	1716.
210	38.05525	208.77	54.1	-18.100	-14.451	0.87942	0.224	0.601	1610.
215	36.69774	171.32	48.8	-15.146	-11.362	0.89395	0.224	0.636	1500.
220	35.18797	135.47	43.5	-12.016	-8.069	0.90909	0.225	0.685	1383.
225	33.45508	101.27	38.1	-8.626	-4.474	0.92525	0.226	0.759	1256.
230	31.36639	69.27	32.4	-4.824	-0.397	0.94317	0.227	0.884	1117.
235	28.64876	41.32	26.3	-0.302	4.546	0.96442	0.231	1.118	963.
240	24.85409	22.64	19.8	5.456	11.044	0.99176	0.237	1.435	811.
245	20.42049	17.51	14.5	12.047	18.848	1.02394	0.241	1.549	722.
250	16.91716	19.69	11.2	17.748	25.958	1.05268	0.237	1.272	695.
260	13.06158	30.84	7.9	25.371	36.004	1.09215	0.224	0.799	714.
270	11.11338	42.57	6.4	30.357	42.854	1.11802	0.214	0.598	743.
280	9.88447	53.11	5.4	34.237	48.288	1.13779	0.206	0.499	771.
290	9.00554	62.59	4.8	37.545	52.967	1.15422	0.201	0.442	798.
300	8.32927	71.24	4.3	40.510	57.184	1.16852	0.197	0.404	822.
320	7.32976	86.77	3.6	45.820	64.768	1.19301	0.192	0.359	867.
340	6.60599	100.67	3.2	50.637	71.661	1.21391	0.189	0.333	907.
360	6.04572	113.44	2.8	55.157	78.129	1.23240	0.186	0.315	943.
380	5.59313	125.41	2.6	59.482	84.313	1.24912	0.185	0.304	977.
400	5.21650	136.77	2.4	63.670	90.293	1.26446	0.184	0.295	1009.
420	4.89617	147.65	2.2	67.756	96.122	1.27868	0.183	0.288	1039.
440	4.61910	158.14	2.0	71.765	101.832	1.29196	0.182	0.283	1068.
460	4.37621	168.32	1.9	75.714	107.450	1.30445	0.181	0.279	1095.
480	4.16097	178.24	1.8	79.614	112.992	1.31624	0.181	0.275	1121.
500	3.96848	187.94	1.7	83.475	118.472	1.32743	0.181	0.273	1146.
520	3.79501	197.45	1.6	87.304	123.900	1.33807	0.180	0.270	1171.
540	3.63766	206.79	1.6	91.105	129.285	1.34823	0.180	0.268	1194.
560	3.49410	215.99	1.5	94.884	134.632	1.35796	0.180	0.267	1217.
580	3.36246	225.06	1.4	98.644	139.948	1.36728	0.180	0.265	1239.
600	3.24122	234.03	1.4	102.387	145.237	1.37625	0.180	0.264	1261.
650	2.97579	256.03	1.2	111.691	158.362	1.39726	0.180	0.261	1313.
700	2.75308	277.55	1.1	120.939	171.385	1.41657	0.180	0.260	1362.
750	2.56308	298.71	1.1	130.155	184.341	1.43444	0.180	0.259	1409.
800	2.39880	319.57	0.979	139.359	197.257	1.45111	0.181	0.258	1454.
850	2.25516	340.20	0.916	148.567	210.152	1.46675	0.181	0.258	1497.
900	2.12835	360.63	0.861	157.793	223.047	1.48149	0.182	0.258	1538.
950	2.01550	380.90	0.813	167.047	235.955	1.49545	0.183	0.258	1577.
1000	1.91436	401.03	0.769	176.340	248.889	1.50872	0.184	0.259	1615.
1100	1.74044	440.97	0.696	195.077	274.875	1.53348	0.187	0.261	1688.
1200	1.59608	480.57	0.635	214.054	301.070	1.55627	0.190	0.263	1756.
1300	1.47421	519.92	0.584	233.305	327.514	1.57744	0.193	0.266	1821.
1400	1.36988	559.07	0.541	252.846	354.230	1.59724	0.196	0.269	1883.
1500	1.27952	598.08	0.504	272.683	381.228	1.61586	0.199	0.271	1943.
2000	0.96306	791.68	0.376	376.073	520.285	1.69578	0.213	0.284	2213.
2500	0.77259	984.07	0.300	485.208	664.973	1.76031	0.223	0.294	2453.
3000	0.64517	1175.95	0.250	598.392	813.660	1.81451	0.229	0.300	2671.
3500	0.55388	1367.57	0.214	714.388	965.134	1.86120	0.234	0.305	2873.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

800 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*115.834	54.30331	2012.21	240.2	-64.395	-61.667	0.58275	0.254	0.463	4120.
120	53.79662	1787.01	221.4	-62.475	-59.721	0.59926	0.260	0.470	3871.
125	53.16378	1565.42	202.3	-60.142	-57.356	0.61857	0.261	0.475	3634.
130	52.50466	1384.53	186.0	-57.796	-54.975	0.63725	0.259	0.477	3439.
135	51.82051	1234.36	171.9	-55.446	-52.587	0.65527	0.255	0.478	3273.
140	51.11278	1107.43	159.3	-53.096	-50.197	0.67265	0.251	0.478	3127.
145	50.38269	998.16	147.9	-50.746	-47.805	0.68944	0.247	0.479	2995.
150	49.63097	902.41	137.6	-48.395	-45.410	0.70568	0.243	0.480	2873.
155	48.85778	817.15	128.1	-46.040	-43.008	0.72143	0.240	0.481	2757.
160	48.06260	740.17	119.4	-43.678	-40.595	0.73675	0.237	0.484	2647.
165	47.24428	669.91	111.3	-41.303	-38.167	0.75169	0.234	0.487	2540.
170	46.40105	605.20	103.7	-38.912	-35.719	0.76631	0.232	0.492	2436.
175	45.53052	545.25	96.5	-36.498	-33.245	0.78065	0.231	0.498	2335.
180	44.62967	489.43	89.8	-34.058	-30.738	0.79478	0.229	0.505	2235.
185	43.69476	437.29	83.4	-31.583	-28.193	0.80872	0.228	0.513	2135.
190	42.72110	388.43	77.3	-29.069	-25.602	0.82254	0.227	0.524	2037.
195	41.70282	342.53	71.5	-26.507	-22.955	0.83629	0.226	0.536	1939.
200	40.63223	299.27	65.8	-23.887	-20.241	0.85003	0.225	0.550	1840.
205	39.49902	258.36	60.4	-21.196	-17.446	0.86384	0.225	0.568	1739.
210	38.28876	219.52	55.1	-18.417	-14.548	0.87780	0.224	0.591	1637.
215	36.98039	182.53	49.9	-15.526	-11.520	0.89205	0.224	0.621	1531.
220	35.54170	147.25	44.7	-12.483	-8.315	0.90678	0.224	0.663	1419.
225	33.92055	113.72	39.5	-9.230	-4.863	0.92230	0.225	0.722	1301.
230	32.02713	82.34	34.2	-5.662	-1.037	0.93911	0.226	0.815	1172.
235	29.69918	54.40	28.6	-1.597	3.391	0.95815	0.229	0.959	1034.
240	26.67893	33.06	22.7	3.256	8.809	0.98096	0.233	1.210	892.
245	22.95151	22.66	17.4	8.939	15.394	1.00810	0.237	1.385	783.
250	19.38695	21.24	13.5	14.543	22.184	1.03555	0.237	1.255	733.
260	14.74353	28.87	9.3	23.016	33.064	1.07827	0.227	0.890	724.
270	12.32699	39.97	7.3	28.616	40.634	1.10687	0.216	0.653	747.
280	10.84961	50.59	6.1	32.847	46.501	1.12822	0.209	0.533	774.
290	9.81978	60.29	5.3	36.376	51.462	1.14563	0.203	0.465	800.
300	9.04166	69.18	4.8	39.493	55.877	1.16060	0.199	0.421	824.
320	7.91158	85.13	4.0	45.001	63.726	1.18595	0.193	0.369	869.
340	7.10576	99.36	3.5	49.944	70.791	1.20738	0.189	0.340	909.
360	6.48851	112.42	3.1	54.552	77.384	1.22622	0.187	0.321	946.
380	5.99311	124.62	2.8	58.943	83.661	1.24320	0.185	0.308	980.
400	5.58290	136.17	2.6	63.181	89.717	1.25873	0.184	0.298	1011.
420	5.23532	147.22	2.4	67.309	95.606	1.27310	0.183	0.291	1042.
440	4.93555	157.87	2.2	71.353	101.369	1.28650	0.182	0.285	1070.
460	4.67339	168.18	2.1	75.331	107.031	1.29909	0.182	0.281	1098.
480	4.44151	178.22	1.9	79.257	112.611	1.31096	0.181	0.277	1124.
500	4.23447	188.03	1.8	83.140	118.125	1.32222	0.181	0.274	1149.
520	4.04813	197.64	1.8	86.989	123.584	1.33292	0.181	0.272	1174.
540	3.87929	207.07	1.7	90.808	128.996	1.34313	0.180	0.270	1197.
560	3.72540	216.35	1.6	94.602	134.368	1.35290	0.180	0.268	1220.
580	3.58440	225.50	1.5	98.376	139.706	1.36227	0.180	0.266	1243.
600	3.45464	234.54	1.5	102.132	145.015	1.37127	0.180	0.255	1264.
650	3.17083	256.69	1.3	111.463	158.184	1.39235	0.180	0.262	1316.
700	2.93297	278.35	1.2	120.734	171.244	1.41171	0.180	0.260	1366.
750	2.73022	299.62	1.1	129.970	184.231	1.42963	0.180	0.259	1412.
800	2.55502	320.58	1.0	139.191	197.172	1.44633	0.181	0.259	1457.
850	2.40190	341.29	0.980	148.413	210.090	1.46200	0.182	0.258	1500.
900	2.26678	361.79	0.921	157.651	223.005	1.47676	0.182	0.258	1541.
950	2.14656	382.12	0.868	166.916	235.930	1.49074	0.183	0.259	1580.
1000	2.03884	402.31	0.822	176.219	248.879	1.50402	0.185	0.259	1615.
1100	1.85365	442.35	0.743	194.972	274.892	1.52881	0.187	0.261	1691.
1200	1.69996	482.03	0.678	213.963	301.108	1.55162	0.190	0.263	1759.
1300	1.57024	521.44	0.624	233.225	327.569	1.57280	0.193	0.266	1824.
1400	1.45919	560.64	0.578	252.776	354.300	1.59261	0.196	0.269	1886.
1500	1.36300	599.68	0.538	272.621	381.310	1.61124	0.199	0.272	1946.
2000	1.02614	793.41	0.402	376.039	520.408	1.69119	0.213	0.294	2216.
2500	0.82335	985.85	0.321	485.190	665.117	1.75573	0.223	0.294	2455.
3000	0.68766	1177.75	0.267	598.384	813.816	1.80993	0.229	0.301	2673.
3500	0.59042	1369.37	0.229	714.387	965.298	1.85663	0.234	0.305	2875.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

900 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*116.103	54.32107	2015.36	238.2	-64.356	-61.288	0.58308	0.257	0.462	4097.
120	53.85229	1805.58	220.9	-62.566	-59.472	0.59847	0.262	0.469	387C.
125	53.22729	1583.54	202.1	-60.244	-57.113	0.61773	0.263	0.474	3635.
130	52.57642	1402.29	186.1	-57.909	-54.739	0.63635	0.261	0.476	3443.
135	51.90095	1251.86	172.1	-55.570	-52.359	0.65431	0.257	0.476	3280.
140	51.20238	1124.79	159.6	-53.232	-49.977	0.67164	0.252	0.476	3136.
145	50.48201	1015.48	148.4	-50.895	-47.594	0.68836	0.248	0.477	3007.
150	49.74073	919.77	138.3	-48.558	-45.208	0.70454	0.244	0.478	2886.
155	48.97887	834.62	128.9	-46.219	-42.816	0.72023	0.241	0.479	2773.
160	48.19612	757.80	120.3	-43.873	-40.415	0.73547	0.238	0.431	2665.
165	47.39160	687.72	112.2	-41.517	-38.001	0.75033	0.235	0.435	2561.
170	46.56386	623.24	104.7	-39.147	-35.568	0.76486	0.233	0.439	2459.
175	45.71091	563.52	97.6	-36.757	-33.111	0.77910	0.232	0.444	2360.
180	44.83021	507.94	91.0	-34.344	-30.626	0.79310	0.230	0.500	2262.
185	43.91865	456.06	84.7	-31.901	-28.106	0.80691	0.229	0.508	2166.
190	42.97241	407.50	78.7	-29.423	-25.545	0.82057	0.228	0.517	2071.
195	41.98677	361.93	72.9	-26.904	-22.935	0.83413	0.227	0.527	1975.
200	40.95574	319.07	67.4	-24.336	-20.267	0.84764	0.226	0.540	1880.
205	39.87156	278.64	62.1	-21.709	-17.529	0.86116	0.225	0.555	1785.
210	38.72379	240.41	56.9	-19.010	-14.707	0.87476	0.225	0.574	1687.
215	37.49792	204.16	51.9	-16.223	-11.779	0.88853	0.224	0.598	1588.
220	36.17322	169.77	47.0	-13.324	-8.716	0.90261	0.224	0.629	1486.
225	34.71899	137.24	42.1	-10.275	-5.475	0.91718	0.224	0.670	1379.
230	33.08853	106.83	37.2	-7.026	-1.989	0.93250	0.225	0.728	1266.
235	31.21030	79.20	32.2	-3.494	1.846	0.94999	0.226	0.811	1148.
240	28.98366	55.83	27.2	0.432	6.182	0.96725	0.228	0.929	1027.
245	26.32840	39.08	22.3	4.840	11.170	0.98781	0.230	1.064	914.
250	23.38422	30.55	18.0	9.586	16.713	1.01021	0.233	1.134	830.
260	18.22659	29.60	12.4	18.368	27.511	1.05258	0.230	0.932	765.
270	14.94099	37.19	9.4	24.985	36.140	1.08517	0.221	0.753	766.
280	12.90896	46.93	7.7	29.946	42.856	1.10961	0.213	0.603	785.
290	11.53468	56.61	6.6	33.954	48.403	1.12909	0.206	0.514	808.
300	10.52628	65.73	5.8	37.402	53.234	1.14547	0.202	0.457	831.
320	9.10694	82.31	4.7	43.336	61.636	1.17261	0.195	0.391	874.
340	8.12435	97.12	4.1	48.543	69.057	1.19511	0.191	0.354	914.
360	7.38534	110.66	3.6	53.334	75.901	1.21468	0.188	0.332	951.
380	6.80008	123.28	3.2	57.861	82.369	1.23217	0.186	0.316	985.
400	6.32004	135.20	3.0	62.205	88.575	1.24808	0.185	0.305	1017.
420	5.91618	146.57	2.7	66.418	94.588	1.26275	0.184	0.297	1047.
440	5.56982	157.50	2.5	70.532	100.454	1.27640	0.183	0.290	1076.
460	5.26825	168.07	2.4	74.569	106.204	1.28918	0.182	0.285	1104.
480	5.00248	178.33	2.2	78.546	111.861	1.30122	0.182	0.291	1130.
500	4.76590	188.34	2.1	82.474	117.443	1.31261	0.181	0.277	1156.
520	4.55351	198.14	2.0	86.361	122.961	1.32344	0.181	0.275	1180.
540	4.36147	207.74	1.9	90.215	128.427	1.33375	0.181	0.272	1204.
560	4.18675	217.18	1.8	94.041	133.848	1.34361	0.181	0.270	1227.
580	4.02692	226.48	1.7	97.843	139.230	1.35305	0.180	0.268	1249.
600	3.88002	235.65	1.7	101.625	144.579	1.36212	0.180	0.267	1271.
650	3.55934	258.10	1.5	111.012	157.835	1.38334	0.180	0.254	1323.
700	3.29117	280.01	1.4	120.328	170.967	1.40280	0.180	0.262	1372.
750	3.06294	301.50	1.3	129.602	184.014	1.42081	0.181	0.260	1419.
800	2.86596	322.64	1.2	138.856	197.007	1.43758	0.181	0.259	1464.
850	2.69396	343.51	1.1	148.106	209.971	1.45330	0.182	0.259	1507.
900	2.54228	364.16	1.0	157.368	222.924	1.46811	0.183	0.259	1548.
950	2.40741	384.62	0.980	166.655	235.893	1.48212	0.184	0.259	1587.
1000	2.28661	404.92	0.927	175.978	248.863	1.49543	0.185	0.260	1625.
1100	2.07901	445.14	0.838	194.764	274.928	1.52028	0.187	0.262	1697.
1200	1.90679	484.96	0.764	213.782	301.186	1.54312	0.190	0.264	1766.
1300	1.76146	524.49	0.703	233.066	327.691	1.56433	0.193	0.266	1830.
1400	1.63706	563.79	0.651	252.636	354.441	1.58416	0.196	0.269	1892.
1500	1.52931	602.92	0.606	272.498	381.476	1.60281	0.199	0.272	1951.
2000	1.15191	796.88	0.452	375.971	520.654	1.68280	0.213	0.234	2221.
2500	0.92460	989.42	0.361	485.153	665.404	1.74736	0.223	0.294	2460.
3000	0.77243	1181.35	0.300	598.367	814.128	1.80157	0.230	0.301	2677.
3500	0.66335	1372.99	0.257	714.383	965.624	1.84827	0.234	0.305	2879.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*116.371	54.33911	2018.67	236.3	-64.317	-60.909	0.58341	0.260	0.462	4076.
120	53.90739	1824.15	220.5	-62.656	-59.221	0.59769	0.264	0.468	3869.
125	53.29009	1601.64	201.9	-60.343	-56.869	0.61690	0.265	0.472	3637.
130	52.64729	1420.01	186.1	-58.019	-54.501	0.63547	0.262	0.474	3448.
135	51.98028	1269.32	172.3	-55.691	-52.129	0.65338	0.258	0.475	3287.
140	51.29061	1142.08	160.0	-53.365	-49.755	0.67064	0.254	0.475	3146.
145	50.57966	1032.70	149.0	-51.041	-47.380	0.68731	0.250	0.475	3018.
150	49.84845	937.01	138.9	-48.718	-45.003	0.70343	0.246	0.476	2900.
155	49.09745	851.95	129.6	-46.393	-42.621	0.71904	0.242	0.477	2789.
160	48.32658	775.27	121.1	-44.064	-40.232	0.73422	0.239	0.479	2683.
165	47.53517	705.37	113.1	-41.726	-37.830	0.74900	0.236	0.482	2581.
170	46.72206	641.08	105.7	-39.375	-35.412	0.76344	0.234	0.486	2481.
175	45.88558	581.56	98.7	-37.008	-32.972	0.77758	0.232	0.490	2384.
180	45.02362	526.21	92.1	-34.619	-30.506	0.79147	0.231	0.496	2289.
185	44.13358	474.55	85.9	-32.205	-28.010	0.80516	0.229	0.503	2195.
190	43.21232	426.23	80.0	-29.761	-25.476	0.81867	0.228	0.511	2103.
195	42.25603	380.94	74.3	-27.281	-22.899	0.83206	0.227	0.520	2011.
200	41.25999	338.40	68.9	-24.759	-20.270	0.84536	0.226	0.531	1919.
205	40.21826	298.36	63.7	-22.187	-17.583	0.85864	0.225	0.544	1827.
210	39.12311	260.60	58.6	-19.556	-14.823	0.87194	0.225	0.560	1734.
215	37.96426	224.92	53.8	-16.855	-11.977	0.88533	0.224	0.579	1641.
220	36.72770	191.19	49.0	-14.066	-9.024	0.89891	0.224	0.603	1545.
225	35.39402	159.39	44.3	-11.167	-5.935	0.91279	0.224	0.634	1446.
230	33.93606	129.65	39.7	-8.128	-2.672	0.92713	0.224	0.674	1345.
235	32.31626	102.39	35.1	-4.907	0.823	0.94216	0.224	0.727	1240.
240	30.48652	78.40	30.6	-1.450	4.624	0.95816	0.225	0.796	1134.
245	28.40174	58.99	26.2	2.290	8.810	0.97542	0.226	0.879	1030.
250	26.07201	45.55	22.0	6.300	13.403	0.99398	0.228	0.953	939.
260	21.32961	35.83	15.6	14.431	23.113	1.03206	0.229	0.951	831.
270	17.61068	38.41	11.8	21.433	31.948	1.06542	0.223	0.807	802.
280	15.07814	45.73	9.5	26.984	39.265	1.09205	0.216	0.663	806.
290	13.33942	54.53	8.0	31.465	45.347	1.11340	0.209	0.561	822.
300	12.07741	63.43	6.9	35.257	50.590	1.13118	0.204	0.493	842.
320	10.33875	80.19	5.6	41.642	59.554	1.16014	0.197	0.413	883.
340	9.16379	95.39	4.7	47.129	67.336	1.18374	0.192	0.369	922.
360	8.29477	109.33	4.2	52.111	74.435	1.20404	0.189	0.343	958.
380	7.61466	122.31	3.7	56.777	81.095	1.22204	0.187	0.325	992.
400	7.06164	134.54	3.4	61.229	87.452	1.23835	0.185	0.312	1024.
420	6.59944	146.19	3.1	65.528	93.588	1.25332	0.184	0.302	1054.
440	6.20509	157.37	2.9	69.713	99.556	1.26720	0.183	0.295	1083.
460	5.86315	168.16	2.7	73.810	105.394	1.28018	0.183	0.289	1110.
480	5.56281	178.64	2.5	77.838	111.127	1.29238	0.182	0.284	1137.
500	5.29619	188.84	2.4	81.811	116.775	1.30391	0.182	0.291	1162.
520	5.05740	198.80	2.3	85.737	122.353	1.31485	0.181	0.277	1187.
540	4.84191	208.57	2.1	89.626	127.871	1.32526	0.181	0.275	1211.
560	4.64619	218.15	2.0	93.483	133.339	1.33521	0.181	0.272	1234.
580	4.46741	227.59	1.9	97.314	138.765	1.34472	0.181	0.270	1256.
600	4.30329	236.88	1.9	101.122	144.153	1.35386	0.181	0.269	1278.
650	3.94557	259.62	1.7	110.563	157.495	1.37522	0.180	0.265	1330.
700	3.64719	281.76	1.5	119.925	170.698	1.39479	0.180	0.263	1379.
750	3.39356	303.45	1.4	129.237	183.805	1.41287	0.181	0.261	1426.
800	3.17489	324.77	1.3	138.523	196.849	1.42971	0.181	0.260	1471.
850	2.98411	345.80	1.2	147.801	209.856	1.44548	0.182	0.260	1513.
900	2.81599	366.58	1.2	157.088	222.848	1.46033	0.183	0.260	1554.
950	2.66656	387.15	1.1	166.396	235.841	1.47439	0.184	0.260	1594.
1000	2.53277	407.56	1.0	175.738	248.851	1.48773	0.185	0.260	1632.
1100	2.30295	447.96	0.933	194.557	274.966	1.51262	0.187	0.262	1704.
1200	2.11237	487.93	0.851	213.601	301.266	1.53550	0.190	0.264	1772.
1300	1.95156	527.57	0.782	232.908	327.796	1.55674	0.193	0.267	1836.
1400	1.81393	566.97	0.724	252.497	354.584	1.57659	0.196	0.269	1898.
1500	1.69473	606.17	0.674	272.375	381.643	1.59526	0.199	0.272	1957.
2000	1.27712	800.37	0.502	375.903	520.900	1.67529	0.213	0.235	2226.
2500	1.02549	993.01	0.401	485.117	665.693	1.73987	0.223	0.294	2464.
3000	0.85695	1184.97	0.334	598.351	814.440	1.79409	0.230	0.301	2681.
3500	0.73609	1376.61	0.286	714.380	965.951	1.84080	0.234	0.305	2883.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1100 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*116.638	54.35744	2022.14	234.4	-64.278	-60.530	0.58374	0.263	0.461	4056.
120	53.96193	1842.72	220.0	-62.744	-58.969	0.59693	0.266	0.467	3868.
125	53.35217	1619.73	201.7	-60.441	-56.623	0.61608	0.267	0.471	3639.
130	52.71727	1437.71	186.1	-58.127	-54.263	0.63460	0.264	0.473	3453.
135	52.05853	1286.72	172.5	-55.810	-51.897	0.65245	0.260	0.473	3294.
140	51.37751	1159.30	160.4	-53.496	-49.531	0.66967	0.255	0.473	3155.
145	50.67570	1049.84	149.5	-51.184	-47.164	0.68628	0.251	0.473	3029.
150	49.95420	954.15	139.5	-48.874	-44.796	0.70233	0.247	0.474	2913.
155	49.21366	869.16	130.4	-46.563	-42.424	0.71789	0.243	0.475	2804.
160	48.45414	792.60	121.9	-44.249	-40.045	0.73299	0.240	0.477	2700.
165	47.67521	722.85	114.1	-41.928	-37.655	0.74770	0.237	0.479	2600.
170	46.87593	658.73	106.7	-39.596	-35.251	0.76206	0.235	0.483	2503.
175	46.05494	599.40	99.8	-37.250	-32.827	0.77611	0.233	0.487	2408.
180	45.21047	544.24	93.3	-34.885	-30.380	0.78990	0.231	0.492	2315.
185	44.34035	492.78	87.1	-32.498	-27.904	0.80346	0.230	0.498	2224.
190	43.44195	444.67	81.2	-30.084	-25.395	0.81684	0.229	0.505	2134.
195	42.51229	399.61	75.7	-27.639	-22.848	0.83008	0.228	0.514	2044.
200	41.54751	357.33	70.3	-25.158	-20.256	0.84320	0.227	0.523	1955.
205	40.54303	317.60	65.2	-22.635	-17.611	0.85626	0.226	0.535	1867.
210	39.49303	280.21	60.2	-20.063	-14.905	0.86930	0.225	0.548	1778.
215	38.39006	244.96	55.5	-17.433	-12.127	0.88237	0.224	0.564	1689.
220	37.22434	211.73	50.9	-14.734	-9.262	0.89555	0.224	0.583	1599.
225	35.98298	180.47	46.4	-11.951	-6.290	0.90890	0.223	0.607	1507.
230	34.64900	151.25	42.0	-9.065	-3.136	0.92255	0.223	0.636	1413.
235	33.20054	124.30	37.6	-6.051	0.084	0.93661	0.223	0.673	1318.
240	31.61143	100.12	33.4	-2.882	3.561	0.95125	0.223	0.719	1222.
245	29.85670	79.48	29.3	0.468	7.291	0.96663	0.224	0.773	1128.
250	27.93008	63.32	25.4	4.005	11.298	0.98282	0.225	0.828	1040.
260	23.80201	46.07	18.8	11.365	19.923	1.01664	0.226	0.876	910.
270	20.07703	43.34	14.3	18.266	28.411	1.06868	0.223	0.838	852.
280	17.23715	47.39	11.4	24.125	35.942	1.07608	0.218	0.697	839.
290	15.18099	54.43	9.5	28.984	42.402	1.09876	0.212	0.599	844.
300	13.66843	62.53	8.2	33.098	48.001	1.11775	0.206	0.525	859.
320	11.59695	78.91	6.5	39.935	57.500	1.14843	0.199	0.434	894.
340	10.21894	94.26	5.5	45.707	65.640	1.17313	0.194	0.384	931.
360	9.21345	108.45	4.7	50.885	72.993	1.19415	0.190	0.353	966.
380	8.43452	121.70	4.2	55.694	79.844	1.21267	0.188	0.333	1000.
400	7.80601	134.20	3.8	60.255	86.350	1.22936	0.186	0.318	1031.
420	7.28384	146.09	3.5	64.642	92.607	1.24463	0.185	0.308	1062.
440	6.84038	157.49	3.2	68.899	98.677	1.25875	0.184	0.300	1090.
460	6.45731	168.48	3.0	73.056	104.601	1.27192	0.183	0.293	1118.
480	6.12188	179.14	2.8	77.135	110.409	1.28428	0.183	0.288	1144.
500	5.82486	189.51	2.7	81.152	116.123	1.29594	0.182	0.284	1169.
520	5.55940	199.63	2.5	85.118	121.758	1.30699	0.182	0.280	1194.
540	5.32029	209.54	2.4	89.042	127.329	1.31750	0.181	0.277	1218.
560	5.10344	219.26	2.3	92.930	132.844	1.32753	0.181	0.275	1241.
580	4.90563	228.82	2.2	96.789	138.312	1.33713	0.181	0.272	1263.
600	4.72426	238.24	2.1	100.622	143.739	1.34633	0.181	0.270	1285.
650	4.32967	261.23	1.9	110.118	157.165	1.36782	0.181	0.267	1337.
700	4.00096	283.60	1.7	119.525	170.437	1.38749	0.181	0.264	1386.
750	3.72201	305.48	1.6	128.875	183.602	1.40566	0.181	0.262	1433.
800	3.48177	326.97	1.5	138.192	196.696	1.42256	0.181	0.261	1478.
850	3.27232	348.14	1.4	147.498	209.747	1.43839	0.182	0.261	1520.
900	3.08787	369.05	1.3	156.809	222.776	1.45328	0.183	0.261	1561.
950	2.92400	389.74	1.2	166.139	235.803	1.46737	0.184	0.261	1600.
1000	2.77733	410.25	1.1	175.500	248.842	1.48074	0.185	0.261	1639.
1100	2.52548	450.82	1.0	194.351	275.008	1.50568	0.187	0.262	1710.
1200	2.31669	490.92	0.938	213.422	301.348	1.52860	0.190	0.264	1778.
1300	2.14055	530.68	0.862	232.751	327.912	1.54986	0.193	0.267	1842.
1400	1.98981	570.17	0.798	252.358	354.728	1.56973	0.196	0.269	1904.
1500	1.85925	609.45	0.743	272.253	381.811	1.58862	0.199	0.272	1963.
2000	1.40179	803.87	0.553	375.836	521.147	1.66850	0.213	0.285	2231.
2500	1.12601	996.60	0.441	485.081	665.981	1.73310	0.223	0.294	2469.
3000	0.94122	1188.60	0.367	598.334	814.752	1.78733	0.230	0.301	2685.
3500	0.80864	1380.24	0.314	714.377	966.278	1.83403	0.234	0.305	2886.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1200 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*116.905	54.37603	2025.77	232.5	-64.238	-60.151	0.58407	0.265	0.461	4037.
120	54.01593	1861.28	219.5	-62.831	-58.717	0.59618	0.268	0.466	3867.
125	53.41357	1637.80	201.4	-60.537	-56.377	0.61528	0.269	0.470	3642.
130	52.78641	1455.37	186.0	-58.233	-54.023	0.63374	0.266	0.471	3457.
135	52.13573	1304.08	172.6	-55.927	-51.665	0.65154	0.262	0.472	3301.
140	51.46314	1176.46	160.7	-53.624	-49.306	0.66870	0.257	0.472	3164.
145	50.77018	1066.89	149.9	-51.324	-46.947	0.68526	0.252	0.472	3040.
150	50.05808	971.19	140.1	-49.026	-44.587	0.70126	0.248	0.472	2927.
155	49.32759	886.25	131.1	-46.729	-42.225	0.71675	0.244	0.473	2820.
160	48.57896	809.79	122.7	-44.430	-39.856	0.73179	0.241	0.475	2718.
165	47.81192	740.18	114.9	-42.125	-37.477	0.74643	0.238	0.477	2620.
170	47.02576	676.21	107.7	-39.811	-35.086	0.76071	0.236	0.480	2525.
175	46.21936	617.04	100.8	-37.485	-32.677	0.77467	0.234	0.484	2432.
180	45.39127	562.05	94.4	-35.142	-30.246	0.78837	0.232	0.488	2341.
185	44.53946	510.77	88.3	-32.780	-27.791	0.80182	0.231	0.494	2252.
190	43.66239	462.84	82.5	-30.394	-25.305	0.81508	0.229	0.500	2164.
195	42.75694	417.97	76.9	-27.981	-22.784	0.82818	0.228	0.508	2077.
200	41.82031	375.90	71.7	-25.538	-20.224	0.84114	0.227	0.516	1990.
205	40.84888	336.42	66.6	-23.058	-17.618	0.85401	0.226	0.526	1905.
210	39.83823	299.31	61.8	-20.537	-14.959	0.86682	0.225	0.538	1820.
215	38.78283	264.41	57.1	-17.968	-12.239	0.87963	0.224	0.551	1734.
220	37.67569	231.56	52.6	-15.344	-9.446	0.89247	0.224	0.567	1648.
225	36.50798	200.71	48.2	-12.653	-6.567	0.90541	0.223	0.586	1562.
230	35.26853	171.87	44.0	-9.885	-3.584	0.91852	0.223	0.608	1475.
235	33.94374	145.19	39.9	-7.023	-0.476	0.93188	0.223	0.636	1386.
240	32.51815	120.97	35.8	-4.051	2.782	0.94560	0.222	0.669	1293.
245	30.97720	99.70	31.9	-0.955	6.218	0.95977	0.223	0.706	1211.
250	29.31458	82.00	28.2	2.270	9.850	0.97444	0.223	0.746	1128.
260	25.71912	59.19	21.7	8.993	17.633	1.00496	0.223	0.800	991.
270	22.20681	51.22	16.8	15.587	25.594	1.03501	0.222	0.779	912.
280	19.26487	51.72	13.4	21.506	33.041	1.06210	0.218	0.706	880.
290	16.99059	56.46	11.1	26.600	39.679	1.08540	0.213	0.623	874.
300	15.26224	63.23	9.5	30.975	45.535	1.10526	0.208	0.551	881.
320	12.86916	78.58	7.5	38.232	55.500	1.13745	0.200	0.454	909.
340	11.28330	93.76	6.2	44.287	63.981	1.16318	0.195	0.399	943.
360	10.13753	108.06	5.4	49.661	71.581	1.18491	0.191	0.364	976.
380	9.25714	121.49	4.8	54.614	78.619	1.20394	0.189	0.341	1009.
400	8.55138	134.18	4.3	59.286	85.272	1.22100	0.187	0.325	1040.
420	7.96805	146.27	3.9	63.761	91.649	1.23656	0.185	0.313	1070.
440	7.47470	157.85	3.6	68.089	97.818	1.25091	0.184	0.304	1098.
460	7.04996	169.02	3.3	72.307	103.827	1.26427	0.184	0.297	1126.
480	6.67906	179.84	3.1	76.438	109.708	1.27679	0.183	0.291	1152.
500	6.35139	190.36	2.9	80.499	115.486	1.28858	0.182	0.287	1177.
520	6.05911	200.63	2.8	84.504	121.178	1.29974	0.182	0.283	1202.
540	5.79627	210.67	2.6	88.462	126.800	1.31035	0.182	0.279	1225.
560	5.55824	220.52	2.5	92.381	132.361	1.32046	0.181	0.277	1248.
580	5.34137	230.19	2.4	96.268	137.870	1.33013	0.181	0.274	1271.
600	5.14273	239.71	2.3	100.126	143.336	1.33939	0.181	0.272	1292.
650	4.71124	262.95	2.1	109.677	156.844	1.36102	0.181	0.268	1344.
700	4.35238	285.52	1.9	119.128	170.194	1.38079	0.181	0.265	1394.
750	4.04825	307.59	1.7	128.515	183.407	1.39904	0.181	0.264	1440.
800	3.78656	329.23	1.6	137.865	196.550	1.41601	0.182	0.262	1485.
850	3.55858	350.54	1.5	147.198	209.643	1.43188	0.182	0.262	1527.
900	3.35791	371.57	1.4	156.533	222.709	1.44682	0.183	0.261	1568.
950	3.17972	392.37	1.3	165.884	235.769	1.46094	0.184	0.261	1607.
1000	3.02028	412.98	1.2	175.264	248.838	1.47435	0.185	0.262	1645.
1100	2.74659	453.71	1.1	194.147	275.052	1.49933	0.188	0.263	1717.
1200	2.51976	493.95	1.0	213.244	301.433	1.52228	0.190	0.265	1784.
1300	2.32844	533.81	0.942	232.595	328.030	1.54357	0.193	0.267	1848.
1400	2.16471	573.39	0.871	252.221	354.874	1.56346	0.196	0.270	1910.
1500	2.02289	612.74	0.811	272.131	381.981	1.58217	0.200	0.272	1969.
2000	1.52592	807.38	0.603	375.768	521.395	1.66229	0.213	0.285	2236.
2500	1.22617	1000.20	0.481	485.044	666.270	1.72691	0.223	0.294	2473.
3000	1.02522	1192.23	0.400	598.317	815.065	1.78115	0.230	0.301	2690.
3500	0.88099	1383.87	0.343	714.373	966.605	1.82786	0.234	0.305	2890.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1300 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*117.172	54.39489	2029.55	230.7	-64.197	-59.771	0.59440	0.268	0.460	4020.
120	54.06939	1879.83	219.0	-62.916	-58.463	0.59543	0.270	0.464	3867.
125	53.47429	1655.86	201.2	-60.631	-56.129	0.61449	0.271	0.469	3644.
130	52.85470	1473.01	186.0	-58.337	-53.782	0.63290	0.268	0.470	3462.
135	52.21190	1321.40	172.8	-56.041	-51.431	0.65065	0.263	0.470	3308.
140	51.54753	1193.56	161.0	-53.749	-49.079	0.66776	0.258	0.470	3173.
145	50.86318	1083.87	150.4	-51.461	-46.728	0.68426	0.254	0.470	3052.
150	50.16016	988.13	140.7	-49.175	-44.376	0.70020	0.249	0.470	2940.
155	49.43936	903.22	131.8	-46.892	-42.022	0.71564	0.245	0.471	2835.
160	48.70116	826.85	123.5	-44.606	-39.663	0.73061	0.242	0.473	2735.
165	47.96547	757.36	115.8	-42.317	-37.296	0.74518	0.239	0.475	2635.
170	47.17177	693.53	108.6	-40.020	-34.917	0.75939	0.237	0.477	2545.
175	46.37917	634.51	101.8	-37.712	-32.522	0.77328	0.235	0.481	2455.
180	45.56645	579.66	95.4	-35.390	-30.107	0.78688	0.233	0.495	2366.
185	44.73211	528.53	89.4	-33.051	-27.670	0.80024	0.231	0.490	2278.
190	43.87437	480.75	83.7	-30.692	-25.205	0.81338	0.230	0.496	2192.
195	42.99115	436.04	78.2	-28.309	-22.709	0.82635	0.229	0.503	2108.
200	42.08006	394.16	73.0	-25.899	-20.178	0.83916	0.227	0.510	2024.
205	41.13824	354.87	68.0	-23.458	-17.606	0.85186	0.226	0.519	1941.
210	40.16228	317.99	63.2	-20.982	-14.988	0.86448	0.225	0.529	1859.
215	39.14805	283.34	58.7	-18.467	-12.318	0.87705	0.225	0.540	1777.
220	38.09046	250.80	54.2	-15.906	-9.586	0.88961	0.224	0.553	1695.
225	36.98329	220.26	50.0	-13.292	-6.783	0.90220	0.223	0.568	1612.
230	35.81897	191.72	45.8	-10.617	-3.896	0.91489	0.223	0.587	1530.
235	34.58864	165.24	41.9	-7.872	-0.912	0.92773	0.222	0.608	1447.
240	33.28264	141.03	38.0	-5.046	2.187	0.94077	0.222	0.632	1365.
245	31.89210	119.41	34.3	-2.131	5.417	0.95410	0.222	0.660	1284.
250	30.41253	100.78	30.7	0.876	8.792	0.96773	0.221	0.690	1206.
260	27.22836	74.11	24.3	7.112	15.953	0.99581	0.221	0.738	1070.
270	23.99316	61.39	19.2	13.359	23.392	1.02389	0.221	0.740	977.
280	21.09037	59.30	15.5	19.189	30.604	1.05012	0.218	0.696	929.
290	18.70564	60.52	12.8	24.382	37.251	1.07345	0.214	0.632	911.
300	16.81921	65.59	11.0	28.936	43.250	1.09379	0.209	0.569	909.
320	14.13647	79.29	8.5	36.553	53.582	1.12717	0.202	0.472	927.
340	12.34934	93.97	7.0	42.878	62.371	1.15383	0.196	0.412	957.
360	11.06277	108.19	6.0	48.446	70.206	1.17623	0.192	0.374	988.
380	10.07981	121.69	5.3	53.542	77.424	1.19575	0.189	0.349	1019.
400	9.29588	134.51	4.8	58.324	84.221	1.21318	0.187	0.331	1050.
420	8.65073	146.74	4.3	62.886	90.714	1.22903	0.186	0.318	1079.
440	8.10703	158.48	4.0	67.286	96.980	1.24360	0.185	0.309	1107.
460	7.64032	169.79	3.7	71.564	103.072	1.25714	0.184	0.301	1134.
480	7.23375	180.75	3.4	75.746	109.025	1.26981	0.183	0.295	1160.
500	6.87531	191.40	3.2	79.851	114.865	1.28173	0.183	0.290	1185.
520	6.55614	201.79	3.0	83.895	120.613	1.29301	0.182	0.295	1210.
540	6.26954	211.95	2.9	87.887	126.285	1.30371	0.182	0.232	1233.
560	6.01032	221.91	2.7	91.837	131.890	1.31390	0.182	0.279	1256.
580	5.77441	231.68	2.6	95.751	137.441	1.32364	0.181	0.276	1278.
600	5.55854	241.30	2.5	99.635	142.944	1.33297	0.181	0.274	1300.
650	5.09025	264.76	2.2	109.240	156.533	1.35473	0.181	0.270	1352.
700	4.70140	287.53	2.0	118.735	169.939	1.37460	0.181	0.257	1401.
750	4.37222	309.77	1.9	128.159	183.218	1.39292	0.181	0.265	1447.
800	4.08923	331.56	1.7	137.539	196.409	1.40995	0.182	0.263	1492.
850	3.84286	353.00	1.6	146.900	209.544	1.42588	0.182	0.262	1534.
900	3.62611	374.15	1.5	156.259	222.647	1.44086	0.183	0.262	1575.
950	3.43371	395.05	1.4	165.631	235.739	1.45501	0.184	0.262	1614.
1000	3.26162	415.75	1.4	175.029	248.836	1.46845	0.185	0.262	1651.
1100	2.96629	456.64	1.2	193.944	275.100	1.49348	0.188	0.253	1723.
1200	2.72159	497.00	1.1	213.067	301.520	1.51647	0.190	0.265	1791.
1300	2.51522	536.97	1.0	232.440	328.150	1.53778	0.193	0.267	1855.
1400	2.33862	576.63	0.945	252.084	355.022	1.55769	0.197	0.270	1916.
1500	2.18566	616.06	0.879	272.010	382.152	1.57641	0.200	0.273	1974.
2000	1.64951	810.91	0.654	375.701	521.643	1.65658	0.213	0.285	2241.
2500	1.32597	1003.82	0.521	485.008	666.559	1.72122	0.223	0.294	2478.
3000	1.10897	1195.87	0.434	598.301	815.378	1.77547	0.230	0.301	2694.
3500	0.95316	1387.52	0.371	714.370	966.933	1.82218	0.234	0.305	2894.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1400 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*117.438	54.41401	2033.45	229.0	-64.156	-59.392	0.58474	0.270	0.460	4003.
120	54.12232	1898.39	218.5	-62.999	-58.209	0.59470	0.272	0.463	3867.
125	53.53436	1673.90	200.9	-60.724	-55.881	0.61371	0.273	0.467	3647.
130	52.92219	1490.62	186.0	-58.439	-53.540	0.63207	0.269	0.469	3467.
135	52.28709	1338.67	173.0	-56.153	-51.195	0.64977	0.265	0.469	3315.
140	51.63072	1210.60	161.4	-53.872	-48.850	0.66682	0.260	0.469	3182.
145	50.95473	1100.78	150.9	-51.595	-46.507	0.68327	0.255	0.469	3063.
150	50.26051	1004.99	141.3	-49.321	-44.163	0.69916	0.250	0.469	2953.
155	49.54905	920.09	132.5	-47.050	-41.818	0.71454	0.246	0.469	2850.
160	48.82088	843.79	124.3	-44.779	-39.469	0.72946	0.243	0.471	2752.
165	48.07605	774.39	116.7	-42.504	-37.111	0.74396	0.240	0.472	2657.
170	47.31421	710.69	109.5	-40.223	-34.744	0.75810	0.237	0.475	2566.
175	46.53466	651.80	102.8	-37.933	-32.362	0.77191	0.235	0.478	2477.
180	45.73642	597.09	96.5	-35.631	-29.962	0.78543	0.233	0.482	2390.
185	44.91823	546.09	90.5	-33.314	-27.542	0.79869	0.232	0.486	2304.
190	44.07863	498.44	84.8	-30.979	-25.097	0.81173	0.230	0.492	2220.
195	43.21592	453.87	79.4	-28.623	-22.624	0.82458	0.229	0.498	2138.
200	42.32814	412.12	74.3	-26.244	-20.119	0.83726	0.228	0.504	2056.
205	41.41305	372.99	69.3	-23.838	-17.578	0.84981	0.227	0.512	1976.
210	40.46901	336.29	64.6	-21.403	-14.997	0.86225	0.226	0.521	1896.
215	39.48989	301.84	60.1	-18.934	-12.369	0.87462	0.225	0.530	1817.
220	38.47495	269.52	55.8	-16.428	-9.690	0.88694	0.224	0.542	1738.
225	37.41872	239.22	51.6	-13.879	-6.951	0.89925	0.223	0.554	1659.
230	36.31597	210.91	47.6	-11.282	-4.143	0.91159	0.222	0.569	1581.
235	35.16073	184.60	43.7	-8.630	-1.257	0.92400	0.222	0.586	1503.
240	33.94678	160.42	40.0	-5.917	1.720	0.93653	0.221	0.605	1426.
245	32.66851	138.58	36.4	-3.139	4.797	0.94922	0.221	0.626	1349.
250	31.32300	119.36	32.9	-0.292	7.985	0.96210	0.221	0.649	1276.
260	28.45177	90.00	26.6	5.574	14.685	0.98838	0.220	0.689	1143.
270	25.48466	73.31	21.4	11.497	21.670	1.01474	0.219	0.702	1043.
280	22.69606	66.72	17.5	17.169	28.592	1.03991	0.217	0.677	982.
290	20.28671	66.34	14.6	22.365	35.144	1.06291	0.214	0.631	952.
300	18.30149	69.53	12.4	27.019	41.184	1.08339	0.210	0.577	941.
320	15.38507	81.08	9.6	34.918	51.768	1.11758	0.203	0.436	949.
340	13.40890	94.92	7.8	41.489	60.823	1.14504	0.197	0.424	973.
360	11.98463	108.86	6.7	47.243	68.874	1.16807	0.193	0.334	1002.
380	10.89970	122.32	5.9	52.479	76.264	1.18805	0.190	0.357	1031.
400	10.03761	135.19	5.2	57.370	83.198	1.20584	0.188	0.338	1060.
420	9.33052	147.52	4.8	62.019	89.804	1.22195	0.187	0.324	1089.
440	8.73637	159.36	4.4	66.490	96.165	1.23675	0.185	0.313	1117.
460	8.22761	170.79	4.0	70.827	102.337	1.25047	0.184	0.305	1143.
480	7.78536	181.86	3.8	75.060	108.359	1.26329	0.184	0.298	1166.
500	7.39615	192.63	3.5	79.209	114.261	1.27533	0.183	0.292	1194.
520	7.05011	203.12	3.3	83.291	120.064	1.28671	0.183	0.288	1218.
540	6.73979	213.38	3.1	87.318	125.784	1.29751	0.182	0.234	1241.
560	6.45944	223.44	3.0	91.298	131.433	1.30778	0.182	0.291	1264.
580	6.20455	233.31	2.8	95.240	137.024	1.31759	0.182	0.275	1286.
600	5.97151	243.02	2.7	99.148	142.563	1.32698	0.182	0.276	1308.
650	5.46659	266.68	2.4	108.806	156.231	1.34886	0.181	0.271	1360.
700	5.04793	289.63	2.2	118.345	169.702	1.36883	0.181	0.268	1408.
750	4.69388	312.02	2.0	127.805	183.036	1.38723	0.181	0.266	1455.
800	4.38975	333.95	1.9	137.217	196.275	1.40432	0.182	0.264	1499.
850	4.12514	355.52	1.8	146.604	209.451	1.42030	0.182	0.263	1541.
900	3.89245	376.78	1.6	155.986	222.590	1.43532	0.183	0.263	1582.
950	3.68598	397.78	1.6	165.379	235.713	1.44951	0.184	0.262	1621.
1000	3.50134	418.56	1.5	174.796	248.839	1.46297	0.185	0.263	1658.
1100	3.18457	459.60	1.3	193.742	275.150	1.48805	0.188	0.264	1730.
1200	2.92218	500.09	1.2	212.891	301.609	1.51107	0.191	0.266	1797.
1300	2.70090	540.16	1.1	232.295	328.272	1.53241	0.194	0.268	1861.
1400	2.51155	579.90	1.0	251.948	355.171	1.55234	0.197	0.270	1922.
1500	2.34754	619.39	0.948	271.890	382.324	1.57108	0.200	0.273	1980.
2000	1.77256	814.45	0.705	375.635	521.892	1.65129	0.213	0.285	2246.
2500	1.42541	1007.44	0.562	484.972	666.849	1.71595	0.223	0.294	2482.
3000	1.19246	1199.52	0.467	598.284	815.691	1.77020	0.230	0.301	2698.
3500	1.02513	1391.17	0.400	714.367	967.260	1.81692	0.234	0.305	2898.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1500 PSIA ISODAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*117.704	54.43337	2037.56	227.2	-64.115	-59.012	0.58508	0.273	0.459	3987.
120	54.17474	1916.94	218.1	-63.081	-57.954	0.59398	0.274	0.462	3868.
125	53.59378	1691.94	200.7	-60.814	-55.632	0.61294	0.274	0.466	3650.
130	52.98888	1508.21	186.0	-58.539	-53.297	0.63125	0.271	0.467	3472.
135	52.36132	1355.91	173.1	-56.263	-50.959	0.64890	0.266	0.468	3322.
140	51.71275	1227.59	161.7	-53.992	-48.621	0.66590	0.261	0.467	3191.
145	51.04498	1117.61	151.3	-51.726	-46.284	0.68230	0.256	0.467	3074.
150	50.35919	1021.75	141.9	-49.464	-43.949	0.69814	0.251	0.467	2966.
155	49.65676	936.86	133.1	-47.205	-41.612	0.71346	0.247	0.468	2864.
160	48.93823	860.60	125.0	-44.947	-39.271	0.72833	0.244	0.469	2768.
165	48.20379	791.29	117.5	-42.686	-36.924	0.74277	0.241	0.470	2675.
170	47.45326	727.70	110.4	-40.421	-34.567	0.75684	0.238	0.473	2586.
175	46.68610	668.92	103.8	-38.148	-32.198	0.77058	0.236	0.475	2499.
180	45.90152	614.33	97.5	-35.864	-29.812	0.78402	0.234	0.479	2413.
185	45.09850	563.45	91.6	-33.567	-27.408	0.79719	0.232	0.483	2330.
190	44.27581	515.92	85.9	-31.255	-24.981	0.81014	0.231	0.488	2248.
195	43.43207	471.45	80.6	-28.925	-22.529	0.82287	0.229	0.493	2167.
200	42.56571	429.82	75.5	-26.574	-20.048	0.83543	0.228	0.499	2087.
205	41.67493	390.81	70.6	-24.201	-17.536	0.84784	0.227	0.506	2009.
210	40.75769	354.25	66.0	-21.802	-14.987	0.86013	0.226	0.514	1932.
215	39.81160	319.96	61.5	-19.375	-12.398	0.87231	0.225	0.522	1855.
220	38.83389	287.81	57.2	-16.917	-9.764	0.88442	0.224	0.532	1775.
225	37.82133	257.69	53.1	-14.424	-7.079	0.89649	0.223	0.542	1704.
230	36.77023	229.55	49.2	-11.892	-4.337	0.90854	0.222	0.555	1629.
235	35.67653	203.37	45.4	-9.317	-1.531	0.92061	0.222	0.568	1554.
240	34.53609	179.21	41.8	-6.695	1.348	0.93273	0.221	0.584	1481.
245	33.34535	157.23	38.3	-4.023	4.307	0.94493	0.220	0.600	1409.
250	32.10247	137.60	34.9	-1.300	7.352	0.95724	0.220	0.618	1339.
260	29.47306	106.33	28.8	4.277	13.701	0.98214	0.219	0.651	1210.
270	26.74064	86.46	23.6	9.921	20.309	1.00707	0.218	0.667	1107.
280	24.09585	76.61	19.4	15.413	26.941	1.03119	0.216	0.655	1037.
290	21.71908	73.64	16.3	20.552	33.341	1.05365	0.214	0.622	997.
300	19.68912	74.88	13.9	25.244	39.352	1.07404	0.210	0.579	978.
320	16.59830	83.96	10.7	33.344	50.079	1.10868	0.203	0.496	974.
340	14.45372	96.64	8.7	40.130	59.348	1.13679	0.198	0.435	992.
360	12.89845	110.10	7.4	46.058	67.593	1.16037	0.194	0.393	1017.
380	11.71395	123.38	6.5	51.429	75.142	1.18078	0.191	0.364	1044.
400	10.77465	136.23	5.8	56.427	82.206	1.19891	0.189	0.344	1072.
420	10.00608	148.59	5.2	61.161	88.921	1.21529	0.187	0.329	1100.
440	9.36173	160.50	4.8	65.702	95.373	1.23030	0.186	0.317	1127.
460	8.81110	172.02	4.4	70.098	101.623	1.24419	0.185	0.308	1153.
480	8.33329	183.18	4.1	74.381	107.713	1.25715	0.184	0.301	1178.
500	7.91344	194.03	3.8	78.574	113.674	1.26932	0.183	0.295	1203.
520	7.54065	204.62	3.6	82.694	119.530	1.28080	0.183	0.290	1227.
540	7.20672	214.97	3.4	86.754	125.297	1.29169	0.183	0.286	1250.
560	6.90534	225.11	3.2	90.764	130.939	1.30204	0.182	0.283	1272.
580	6.63157	235.07	3.1	94.733	136.619	1.31192	0.182	0.280	1294.
600	6.38147	244.85	2.9	98.666	142.193	1.32137	0.182	0.278	1316.
650	5.84017	268.70	2.6	108.376	155.938	1.34337	0.181	0.273	1367.
700	5.39191	291.81	2.4	117.958	169.474	1.36344	0.181	0.269	1416.
750	5.01319	314.35	2.2	127.454	182.662	1.38191	0.182	0.267	1462.
800	4.68810	336.41	2.0	136.897	196.146	1.39906	0.182	0.265	1506.
850	4.40541	358.09	1.9	146.311	209.362	1.41508	0.183	0.264	1548.
900	4.15693	379.46	1.8	155.716	222.537	1.43014	0.183	0.263	1589.
950	3.93651	400.55	1.7	165.129	235.691	1.44437	0.184	0.263	1627.
1000	3.73944	421.42	1.6	174.564	248.845	1.45786	0.185	0.263	1665.
1100	3.40145	462.60	1.4	193.542	275.203	1.48298	0.188	0.264	1736.
1200	3.12152	503.20	1.3	212.716	301.701	1.50604	0.191	0.266	1803.
1300	2.88548	543.37	1.2	232.132	328.396	1.52740	0.194	0.268	1867.
1400	2.68350	583.19	1.1	251.813	355.322	1.54736	0.197	0.270	1928.
1500	2.50855	622.75	1.0	271.770	382.498	1.56611	0.200	0.273	1986.
2000	1.89507	818.01	0.755	375.568	522.142	1.64637	0.213	0.285	2251.
2500	1.52450	1011.07	0.602	484.936	667.139	1.71104	0.223	0.294	2487.
3000	1.27570	1203.18	0.501	598.267	816.005	1.76531	0.230	0.301	2702.
3500	1.09692	1394.83	0.429	714.363	967.588	1.81203	0.234	0.305	2902.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1600 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/ CU. FT	ISOTHERM DERIVATIVE CU. FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*117.969	54.45297	2041.78	225.5	-64.073	-58.632	0.53541	0.275	0.458	3972.
120	54.22666	1935.49	217.6	-63.162	-57.698	0.59326	0.276	0.461	3868.
125	53.65257	1709.96	200.4	-60.903	-55.381	0.61218	0.276	0.465	3653.
130	53.05480	1525.78	185.9	-58.637	-53.052	0.63044	0.273	0.466	3478.
135	52.43460	1373.11	173.3	-56.371	-50.721	0.64804	0.268	0.466	3330.
140	51.79365	1244.52	162.0	-54.110	-48.390	0.66500	0.262	0.466	3201.
145	51.13369	1134.38	151.8	-51.855	-46.060	0.68135	0.257	0.466	3085.
150	50.45627	1038.43	142.4	-49.604	-43.732	0.69713	0.253	0.466	2978.
155	49.76256	953.52	133.8	-47.357	-41.403	0.71241	0.248	0.466	2879.
160	49.05331	877.31	125.8	-45.111	-39.071	0.72721	0.245	0.467	2784.
165	48.32884	809.07	118.3	-42.864	-36.734	0.74160	0.242	0.468	2693.
170	47.58911	744.57	111.3	-40.614	-34.388	0.75561	0.239	0.470	2605.
175	46.83373	685.90	104.7	-38.356	-32.030	0.76927	0.237	0.473	2520.
180	46.06201	631.41	98.5	-36.090	-29.658	0.78264	0.235	0.476	2436.
185	45.27332	580.63	92.6	-33.813	-27.268	0.79573	0.233	0.480	2354.
190	44.46646	533.19	87.0	-31.522	-24.859	0.80858	0.231	0.484	2274.
195	43.64036	488.82	81.7	-29.215	-22.426	0.82122	0.230	0.489	2195.
200	42.79375	447.28	76.7	-26.891	-19.967	0.83367	0.229	0.494	2117.
205	41.92521	408.37	71.9	-24.547	-17.480	0.84595	0.227	0.501	2041.
210	41.03314	371.91	67.3	-22.181	-14.961	0.85810	0.226	0.507	1966.
215	40.11573	337.74	62.9	-19.792	-12.406	0.87012	0.225	0.515	1891.
220	39.17092	305.72	58.7	-17.376	-9.812	0.88204	0.224	0.523	1818.
225	38.19635	275.74	54.6	-14.932	-7.175	0.89390	0.223	0.532	1745.
230	37.18942	247.71	50.7	-12.456	-4.489	0.90570	0.222	0.542	1673.
235	36.14732	221.63	47.0	-9.946	-1.749	0.91749	0.222	0.554	1602.
240	35.06730	197.50	43.4	-7.399	1.050	0.92927	0.221	0.566	1532.
245	33.94707	175.40	40.0	-4.814	3.913	0.94108	0.220	0.580	1463.
250	32.78557	155.49	36.8	-2.191	6.846	0.95293	0.219	0.594	1396.
255	30.34737	122.82	30.7	3.158	12.921	0.97675	0.218	0.620	1272.
260	27.81333	100.44	25.5	8.566	19.219	1.00052	0.217	0.637	1168.
270	25.31630	87.68	21.3	13.880	25.583	1.02367	0.215	0.633	1092.
280	23.00529	82.20	17.9	18.931	31.810	1.04552	0.213	0.610	1044.
290	20.97062	81.46	15.4	23.617	37.746	1.06564	0.210	0.576	1017.
300	17.76350	87.88	11.8	31.846	48.525	1.10046	0.204	0.503	1002.
340	15.47600	99.14	9.6	38.809	57.954	1.12906	0.199	0.443	1012.
360	13.79969	111.92	8.1	44.896	66.366	1.15311	0.194	0.401	1033.
380	12.51973	124.90	7.1	50.396	74.061	1.17392	0.191	0.371	1058.
400	11.50513	137.63	6.3	55.496	81.248	1.19235	0.189	0.349	1085.
420	10.67608	149.97	5.7	60.313	88.065	1.20899	0.188	0.333	1111.
440	9.98215	161.91	5.2	64.923	94.605	1.22420	0.186	0.321	1137.
460	9.39006	173.47	4.8	69.377	100.930	1.23826	0.185	0.312	1163.
480	8.87701	184.70	4.4	73.709	107.086	1.25136	0.184	0.304	1188.
500	8.42675	195.63	4.1	77.945	113.105	1.26365	0.184	0.298	1212.
520	8.02741	206.29	3.9	82.102	119.011	1.27523	0.183	0.293	1236.
540	7.67005	216.71	3.7	86.196	124.824	1.28620	0.183	0.289	1259.
560	7.34781	226.92	3.5	90.236	130.559	1.29663	0.183	0.285	1281.
580	7.05531	236.95	3.3	94.231	136.226	1.30657	0.182	0.282	1303.
600	6.78827	246.81	3.2	98.188	141.835	1.31608	0.182	0.279	1324.
650	6.21089	270.82	2.8	107.951	155.655	1.33821	0.182	0.274	1375.
700	5.73328	294.08	2.6	117.575	169.253	1.35836	0.182	0.270	1424.
750	5.33011	316.75	2.4	127.107	182.694	1.37691	0.182	0.268	1470.
800	4.98425	338.93	2.2	136.580	196.024	1.39412	0.182	0.266	1514.
850	4.68365	360.72	2.0	146.020	209.279	1.41019	0.183	0.265	1555.
900	4.41952	382.18	1.9	155.448	222.488	1.42529	0.183	0.264	1596.
950	4.18529	403.37	1.8	164.882	235.674	1.43955	0.184	0.264	1634.
1000	3.97593	424.31	1.7	174.334	248.854	1.45307	0.185	0.264	1672.
1100	3.61691	465.63	1.5	193.343	275.259	1.47824	0.188	0.265	1743.
1200	3.31963	506.35	1.4	212.543	301.795	1.50132	0.191	0.266	1810.
1300	3.06897	546.60	1.3	231.979	328.522	1.52271	0.194	0.268	1873.
1400	2.85449	586.50	1.2	251.678	355.474	1.54269	0.197	0.271	1934.
1500	2.66870	626.12	1.1	271.651	382.673	1.56145	0.200	0.273	1992.
2000	2.01706	821.57	0.806	375.502	522.392	1.64176	0.213	0.285	2256.
2500	1.62322	1014.72	0.642	484.900	667.429	1.70645	0.223	0.294	2491.
3000	1.35869	1206.85	0.534	598.251	816.318	1.76072	0.230	0.301	2706.
3500	1.16852	1398.49	0.457	714.360	967.916	1.80745	0.234	0.305	2905.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1700 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*118.234	54.47280	2046.14	223.8	-64.031	-58.251	0.58575	0.277	0.458	3958.
120	54.27808	1954.04	217.1	-63.241	-57.441	0.59236	0.278	0.460	3869.
125	53.71074	1727.97	200.2	-60.991	-55.130	0.61143	0.278	0.464	3656.
130	53.11997	1543.33	185.9	-58.733	-52.807	0.62965	0.274	0.465	3483.
135	52.50698	1390.28	173.4	-56.477	-50.482	0.64720	0.269	0.465	3337.
140	51.87346	1261.41	162.3	-54.226	-48.157	0.66411	0.264	0.465	3210.
145	51.22121	1151.08	152.2	-51.981	-45.835	0.68041	0.258	0.464	3096.
150	50.55181	1055.04	143.0	-49.741	-43.514	0.69614	0.254	0.464	2991.
155	49.86653	970.10	134.4	-47.506	-41.193	0.71136	0.249	0.464	2893.
160	49.16623	893.90	126.5	-45.272	-38.869	0.72612	0.246	0.465	2800.
165	48.45133	824.72	119.1	-43.038	-36.541	0.74045	0.242	0.466	2711.
170	47.72192	761.30	112.2	-40.801	-34.205	0.75440	0.240	0.468	2625.
175	46.97776	702.72	105.6	-38.559	-31.858	0.76800	0.237	0.471	2541.
180	46.21836	648.33	99.5	-36.310	-29.499	0.78129	0.235	0.473	2459.
185	45.44307	597.64	93.7	-34.051	-27.123	0.79431	0.233	0.477	2375.
190	44.65106	550.28	88.1	-31.780	-24.730	0.80708	0.232	0.481	2300.
195	43.84142	505.99	82.9	-29.495	-22.315	0.81962	0.230	0.485	2223.
200	43.01312	464.52	77.9	-27.196	-19.877	0.83197	0.229	0.490	2147.
205	42.16503	425.69	73.1	-24.879	-17.413	0.84413	0.228	0.496	2072.
210	41.29591	389.31	68.5	-22.543	-14.920	0.85615	0.227	0.502	1998.
215	40.40439	355.22	64.2	-20.188	-12.397	0.86802	0.225	0.508	1926.
220	39.48894	323.29	60.0	-17.810	-9.838	0.87979	0.224	0.515	1855.
225	38.54784	293.40	56.0	-15.409	-7.242	0.89145	0.223	0.523	1784.
230	37.57925	265.47	52.2	-12.982	-4.605	0.90305	0.222	0.532	1715.
235	36.58125	239.45	48.5	-10.528	-1.922	0.91458	0.222	0.541	1647.
240	35.55199	215.33	45.0	-8.045	0.810	0.92609	0.221	0.552	1579.
245	34.49005	193.15	41.7	-5.532	3.595	0.93757	0.220	0.563	1513.
250	33.39487	173.01	38.5	-2.989	6.437	0.94906	0.219	0.574	1449.
260	31.11139	139.29	32.6	2.172	12.291	0.97201	0.218	0.596	1325.
270	28.74366	114.93	27.4	7.384	18.336	0.99482	0.216	0.611	1226.
280	26.38606	99.66	23.0	12.531	24.462	1.01710	0.215	0.611	1147.
290	24.15704	91.79	19.6	17.480	30.512	1.03833	0.213	0.596	1092.
300	22.14512	89.10	16.8	22.132	36.347	1.05812	0.210	0.570	1058.
320	18.87191	92.76	13.0	30.429	47.110	1.09287	0.204	0.506	1032.
340	16.46902	102.41	10.5	37.535	56.649	1.12181	0.199	0.450	1035.
360	14.68408	114.33	8.9	43.762	65.200	1.14626	0.195	0.407	1052.
380	13.31432	126.88	7.7	49.381	73.025	1.16742	0.192	0.377	1074.
400	12.22724	139.40	6.8	54.579	80.325	1.18614	0.190	0.354	1098.
420	11.33928	151.66	6.1	59.477	87.239	1.20301	0.188	0.338	1124.
440	10.59670	163.58	5.6	64.154	93.862	1.21842	0.187	0.325	1149.
460	9.96380	175.16	5.1	68.665	100.259	1.23264	0.186	0.315	1174.
480	9.41597	186.42	4.8	73.045	106.478	1.24588	0.185	0.307	1198.
500	8.93567	197.40	4.5	77.323	112.553	1.25828	0.184	0.301	1222.
520	8.51007	208.12	4.2	81.517	118.509	1.26996	0.184	0.295	1245.
540	8.12952	218.60	3.9	85.643	124.367	1.28101	0.183	0.291	1268.
560	7.78663	228.87	3.7	89.713	130.141	1.29151	0.183	0.287	1290.
580	7.47558	238.96	3.5	93.734	135.845	1.30152	0.182	0.284	1312.
600	7.19177	248.88	3.4	97.715	141.488	1.31109	0.182	0.281	1333.
650	6.57865	273.03	3.0	107.529	155.381	1.33333	0.182	0.275	1384.
700	6.07198	296.43	2.7	117.195	169.040	1.35358	0.182	0.271	1432.
750	5.64460	319.22	2.5	126.762	182.533	1.37220	0.182	0.269	1477.
800	5.27818	341.52	2.3	136.265	195.907	1.38946	0.182	0.267	1521.
850	4.95985	363.41	2.2	145.731	209.202	1.40558	0.183	0.265	1563.
900	4.68023	384.96	2.0	155.182	222.444	1.42072	0.184	0.265	1603.
950	4.43233	406.23	1.9	164.636	235.660	1.43501	0.185	0.264	1641.
1000	4.21079	427.25	1.8	174.106	248.867	1.44856	0.186	0.264	1679.
1100	3.83097	468.70	1.6	193.145	275.318	1.47377	0.188	0.265	1749.
1200	3.51651	509.52	1.5	212.370	301.892	1.49689	0.191	0.267	1816.
1300	3.25138	549.86	1.3	231.828	328.649	1.51830	0.194	0.269	1879.
1400	3.02451	589.84	1.2	251.544	355.628	1.53830	0.197	0.271	1940.
1500	2.82798	629.52	1.2	271.532	382.850	1.55708	0.200	0.273	1998.
2000	2.13851	825.15	0.857	375.436	522.643	1.63743	0.213	0.235	2261.
2500	1.72160	1018.37	0.682	484.864	667.720	1.70213	0.223	0.294	2496.
3000	1.44142	1210.53	0.567	598.234	816.632	1.75642	0.230	0.301	2710.
3500	1.23993	1402.16	0.486	714.356	968.244	1.80315	0.234	0.305	2909.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1800 PSIA ISOTHERM

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*118.498	54.49285	2050.63	222.2	-63.988	-57.871	0.58610	0.279	0.457	3944.
120	54.32901	1972.60	216.5	-63.318	-57.183	0.59187	0.280	0.459	3870.
125	53.76932	1745.98	199.9	-61.077	-54.877	0.61069	0.279	0.463	3660.
130	53.18440	1560.86	185.8	-58.828	-52.561	0.62886	0.276	0.464	3489.
135	52.57847	1407.42	173.5	-56.581	-50.241	0.64637	0.270	0.464	3345.
140	51.95221	1278.25	162.5	-54.339	-47.924	0.66323	0.265	0.463	3219.
145	51.30746	1167.72	152.6	-52.104	-45.608	0.67948	0.259	0.463	3107.
150	50.64586	1071.56	143.5	-49.875	-43.294	0.69517	0.255	0.463	3004.
155	49.96875	986.58	135.1	-47.651	-40.980	0.71034	0.250	0.463	2907.
160	49.27708	910.39	127.2	-45.429	-38.665	0.72504	0.246	0.463	2816.
165	48.57139	841.26	119.9	-43.208	-36.345	0.73932	0.243	0.465	2728.
170	47.85186	777.91	113.0	-40.985	-34.019	0.75321	0.240	0.466	2644.
175	47.11840	719.41	106.5	-38.757	-31.683	0.76675	0.238	0.468	2561.
180	46.37064	665.10	100.4	-36.524	-29.335	0.77998	0.236	0.471	2481.
185	45.60308	614.48	94.7	-34.282	-26.973	0.79292	0.234	0.474	2402.
190	44.83004	567.20	89.2	-32.030	-24.595	0.80561	0.232	0.478	2325.
195	44.03580	522.97	83.9	-29.766	-22.197	0.81807	0.231	0.482	2249.
200	43.22453	481.56	79.0	-27.489	-19.778	0.83031	0.229	0.486	2175.
205	42.39534	442.78	74.3	-25.197	-17.335	0.84238	0.228	0.491	2102.
210	41.54727	406.45	69.7	-22.890	-14.867	0.85427	0.227	0.496	2030.
215	40.67928	372.43	65.4	-20.565	-12.371	0.86602	0.226	0.502	1960.
220	39.79025	340.56	61.3	-18.222	-9.845	0.87763	0.225	0.508	1890.
225	38.87895	310.74	57.4	-15.859	-7.286	0.88913	0.224	0.515	1822.
230	37.94407	282.87	53.6	-13.475	-4.691	0.90054	0.223	0.523	1755.
235	36.98432	256.88	50.0	-11.070	-2.057	0.91187	0.222	0.531	1689.
240	35.99849	232.76	46.5	-8.641	0.618	0.92313	0.221	0.539	1624.
245	34.98574	210.51	43.2	-6.190	3.338	0.93435	0.220	0.549	1560.
250	33.94585	190.19	40.1	-3.715	6.104	0.94552	0.219	0.558	1499.
260	31.79016	155.64	34.2	1.291	11.776	0.96777	0.217	0.576	1383.
270	29.56234	129.70	29.1	6.336	17.611	0.98979	0.216	0.599	1281.
280	27.33120	112.30	24.7	11.334	23.529	1.01131	0.214	0.592	1199.
290	25.18957	102.23	21.1	16.177	29.410	1.03195	0.212	0.582	1140.
300	23.21773	97.63	18.3	20.777	35.134	1.05135	0.210	0.561	1100.
320	19.91871	98.50	14.1	29.098	45.832	1.08590	0.205	0.507	1063.
340	17.42746	106.41	11.4	36.310	55.437	1.11503	0.200	0.455	1060.
360	15.54785	117.32	9.6	42.659	64.097	1.13979	0.196	0.413	1071.
380	14.09521	129.32	8.3	48.388	72.036	1.16126	0.193	0.382	1090.
400	12.93927	141.55	7.4	53.679	79.439	1.18025	0.190	0.359	1113.
420	11.99445	153.66	6.6	58.654	86.444	1.19734	0.188	0.342	1137.
440	11.20452	165.51	6.0	63.396	93.145	1.21293	0.187	0.329	1161.
460	10.53167	177.08	5.5	67.962	99.611	1.22730	0.186	0.318	1185.
480	9.94967	188.35	5.1	72.389	105.890	1.24067	0.185	0.310	1209.
500	9.43980	199.36	4.8	76.708	112.018	1.25318	0.184	0.303	1232.
520	8.99831	210.11	4.5	80.939	118.023	1.26495	0.184	0.297	1255.
540	8.58488	220.64	4.2	85.097	123.924	1.27609	0.183	0.293	1277.
560	8.22159	230.96	4.0	89.195	129.737	1.28666	0.183	0.289	1299.
580	7.89221	241.10	3.8	93.243	135.477	1.29673	0.183	0.285	1321.
600	7.59183	251.07	3.6	97.247	141.153	1.30635	0.182	0.282	1342.
650	6.94337	275.35	3.2	107.111	155.117	1.32871	0.182	0.277	1392.
700	6.40795	298.87	2.9	116.819	168.836	1.34904	0.182	0.272	1440.
750	5.95662	321.77	2.7	126.421	182.379	1.36773	0.182	0.269	1485.
800	5.56986	344.17	2.5	135.953	195.797	1.38505	0.182	0.267	1529.
850	5.23399	366.15	2.3	145.445	209.129	1.40122	0.183	0.266	1570.
900	4.93905	387.79	2.1	154.918	222.405	1.41640	0.184	0.265	1610.
950	4.67763	409.13	2.0	164.391	235.650	1.43072	0.185	0.265	1648.
1000	4.44404	430.23	1.9	173.880	248.834	1.44429	0.186	0.265	1686.
1100	4.04363	471.80	1.7	192.949	275.380	1.46955	0.188	0.265	1756.
1200	3.71216	512.72	1.6	212.198	301.990	1.49270	0.191	0.267	1822.
1300	3.43270	553.15	1.4	231.677	328.779	1.51414	0.194	0.269	1885.
1400	3.19357	593.19	1.3	251.411	355.784	1.53415	0.197	0.271	1946.
1500	2.98641	632.93	1.2	271.414	383.027	1.55295	0.200	0.274	2003.
2000	2.25944	828.75	0.908	375.370	522.874	1.63334	0.213	0.285	2267.
2500	1.81962	1022.03	0.723	484.828	668.011	1.69807	0.223	0.294	2500.
3000	1.52391	1214.21	0.601	598.218	816.946	1.75236	0.230	0.301	2714.
3500	1.31116	1405.84	0.514	714.353	968.572	1.79909	0.234	0.305	2913.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1900 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*118.762	54.51311	2055.26	220.6	-63.945	-57.491	0.58644	0.281	0.456	3931.
120	54.37947	1991.15	216.0	-63.394	-56.924	0.59118	0.282	0.458	3872.
125	53.82530	1763.98	199.6	-61.161	-54.624	0.60996	0.281	0.461	3664.
130	53.24811	1578.37	185.7	-58.921	-52.313	0.62809	0.277	0.463	3494.
135	52.64909	1424.53	173.6	-56.683	-50.000	0.64555	0.272	0.463	3352.
140	52.02994	1295.05	162.8	-54.451	-47.689	0.66236	0.266	0.462	3228.
145	51.39249	1184.31	153.0	-52.226	-45.380	0.67857	0.261	0.462	3118.
150	50.71847	1089.02	144.0	-50.007	-43.073	0.69421	0.256	0.461	3016.
155	50.06927	1002.97	135.7	-47.793	-40.766	0.70933	0.251	0.461	2922.
160	49.38594	926.78	127.9	-45.583	-38.459	0.72399	0.247	0.462	2832.
165	48.68911	857.69	120.7	-43.374	-36.147	0.73821	0.244	0.463	2746.
170	47.97907	794.39	113.9	-41.164	-33.830	0.75204	0.241	0.464	2662.
175	47.25592	735.96	107.4	-38.950	-31.505	0.76553	0.239	0.466	2581.
180	46.51915	681.72	101.4	-36.732	-29.168	0.77869	0.236	0.469	2502.
185	45.76864	631.17	95.6	-34.506	-26.819	0.79157	0.234	0.471	2425.
190	45.00379	583.95	90.2	-32.272	-24.454	0.80418	0.233	0.475	2349.
195	44.22400	539.77	85.0	-30.028	-22.072	0.81655	0.231	0.478	2275.
200	43.42863	498.41	80.1	-27.772	-19.671	0.82871	0.230	0.482	2202.
205	42.61698	459.67	75.4	-25.504	-17.248	0.84068	0.228	0.487	2131.
210	41.78831	423.38	70.9	-23.222	-14.802	0.85246	0.227	0.492	2061.
215	40.94184	389.39	66.6	-20.925	-12.332	0.86409	0.226	0.497	1992.
220	40.07677	357.56	62.5	-18.614	-9.834	0.87557	0.225	0.502	1924.
225	39.19222	327.78	58.6	-16.286	-7.308	0.88693	0.224	0.508	1858.
230	38.28731	299.94	54.9	-13.940	-4.751	0.89817	0.223	0.515	1793.
235	37.36116	273.98	51.3	-11.578	-2.160	0.90931	0.222	0.522	1729.
240	36.41304	249.84	47.9	-9.197	0.466	0.92037	0.221	0.529	1666.
245	35.44245	227.53	44.7	-6.798	3.129	0.93135	0.220	0.537	1605.
250	34.44955	207.05	41.6	-4.382	5.831	0.94227	0.219	0.544	1545.
260	32.40132	171.84	35.8	0.494	11.353	0.96392	0.217	0.560	1433.
270	30.29217	144.62	30.7	5.396	17.011	0.98528	0.215	0.571	1333.
280	28.17369	125.40	26.3	10.261	22.749	1.00614	0.214	0.575	1250.
290	26.11958	113.35	22.7	15.002	28.473	1.02623	0.212	0.568	1187.
300	24.19666	106.93	19.7	19.541	34.082	1.04525	0.210	0.552	1142.
320	20.90238	105.01	15.3	27.851	44.684	1.07947	0.205	0.506	1096.
340	18.34758	111.10	12.4	35.140	54.316	1.10869	0.200	0.458	1085.
360	16.38784	120.89	10.4	41.591	63.060	1.13369	0.196	0.418	1092.
380	14.86015	132.22	9.0	47.419	71.095	1.15542	0.193	0.387	1108.
400	13.63966	144.08	7.9	52.796	78.591	1.17465	0.191	0.364	1128.
420	12.64050	155.97	7.1	57.845	85.679	1.19194	0.189	0.346	1150.
440	11.80480	167.72	6.4	62.650	92.454	1.20770	0.187	0.332	1173.
460	11.09305	179.23	5.9	67.268	98.985	1.22222	0.186	0.321	1197.
480	10.47765	190.49	5.5	71.742	105.322	1.23571	0.185	0.313	1220.
500	9.93877	201.50	5.1	76.101	111.502	1.24832	0.185	0.306	1243.
520	9.46185	212.27	4.8	80.367	117.552	1.26019	0.184	0.300	1265.
540	9.03590	222.83	4.5	84.557	123.495	1.27140	0.184	0.295	1287.
560	8.65250	233.19	4.2	88.683	129.347	1.28204	0.183	0.291	1309.
580	8.30506	243.36	4.0	92.756	135.121	1.29217	0.183	0.287	1330.
600	7.98933	253.37	3.8	96.784	140.829	1.30185	0.183	0.284	1351.
650	7.30498	277.76	3.4	106.698	154.862	1.32432	0.182	0.278	1400.
700	6.74116	301.39	3.1	116.446	168.639	1.34474	0.182	0.273	1448.
750	6.26615	324.39	2.8	126.082	182.231	1.36350	0.182	0.270	1493.
800	5.85928	346.88	2.6	135.644	195.692	1.38087	0.183	0.268	1536.
850	5.50606	368.95	2.4	145.161	209.061	1.39708	0.183	0.267	1578.
900	5.19598	390.67	2.3	154.656	222.370	1.41230	0.184	0.266	1617.
950	4.92117	412.08	2.1	164.149	235.644	1.42665	0.185	0.265	1656.
1000	4.67567	433.24	2.0	173.655	248.904	1.44025	0.186	0.265	1692.
1100	4.25489	474.93	1.8	192.754	275.444	1.46555	0.188	0.266	1763.
1200	3.90659	515.95	1.6	212.028	302.091	1.48873	0.191	0.267	1829.
1300	3.61294	556.46	1.5	231.527	328.910	1.51020	0.194	0.269	1892.
1400	3.36167	596.57	1.4	251.279	355.941	1.53023	0.197	0.271	1952.
1500	3.14397	636.37	1.3	271.297	383.206	1.54904	0.200	0.274	2009.
2000	2.37984	832.35	0.958	375.304	523.146	1.62947	0.213	0.286	2272.
2500	1.91728	1025.71	0.763	484.793	668.302	1.69422	0.223	0.295	2505.
3000	1.60614	1217.90	0.634	598.201	817.261	1.74852	0.230	0.301	2718.
3500	1.38220	1409.53	0.543	714.350	968.900	1.79526	0.234	0.305	2917.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

2000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*119.025	54.53358	2060.01	219.0	-63.901	-57.110	0.58678	0.283	0.456	3920.
120	54.42946	2009.71	215.5	-63.469	-56.665	0.59051	0.284	0.457	3873.
125	53.88170	1781.98	199.3	-61.244	-54.370	0.60924	0.283	0.460	3667.
130	53.31112	1595.87	185.7	-59.012	-52.065	0.62732	0.278	0.461	3500.
135	52.71887	1441.61	173.7	-56.783	-49.758	0.64474	0.273	0.461	3359.
140	52.10666	1311.91	163.1	-54.560	-47.453	0.66151	0.267	0.461	3237.
145	51.47634	1200.84	153.4	-52.345	-45.150	0.67767	0.262	0.460	3128.
150	50.82969	1104.41	144.5	-50.136	-42.850	0.69326	0.257	0.460	3029.
155	50.16818	1019.29	136.3	-47.933	-40.550	0.70834	0.252	0.460	2935.
160	49.49290	943.08	128.6	-45.733	-38.250	0.72295	0.248	0.460	2847.
165	48.80460	874.00	121.4	-43.536	-35.947	0.73712	0.245	0.461	2762.
170	48.10367	810.76	114.7	-41.338	-33.639	0.75090	0.242	0.462	2681.
175	47.39020	752.39	108.3	-39.138	-31.323	0.76433	0.239	0.464	2601.
180	46.66409	698.21	102.3	-36.934	-28.998	0.77743	0.237	0.466	2523.
185	45.92503	647.72	96.6	-34.724	-26.660	0.79024	0.235	0.469	2448.
190	45.17265	600.55	91.2	-32.507	-24.308	0.80278	0.233	0.472	2373.
195	44.40647	556.41	86.0	-30.281	-21.941	0.81508	0.231	0.475	2300.
200	43.62598	515.08	81.2	-28.045	-19.556	0.82716	0.230	0.479	2229.
205	42.83066	476.37	76.5	-25.799	-17.152	0.83903	0.229	0.483	2159.
210	42.01995	440.10	72.1	-23.541	-14.727	0.85072	0.227	0.487	2090.
215	41.19328	406.13	67.8	-21.271	-12.280	0.86223	0.226	0.492	2023.
220	40.35007	374.32	63.8	-18.987	-9.809	0.87360	0.225	0.497	1957.
225	39.48973	344.56	59.9	-16.691	-7.312	0.88482	0.224	0.502	1892.
230	38.61168	316.74	56.2	-14.380	-4.788	0.89591	0.223	0.503	1829.
235	37.71537	290.77	52.7	-12.056	-2.236	0.90689	0.222	0.514	1766.
240	36.80040	266.61	49.3	-9.717	0.347	0.91776	0.221	0.520	1706.
245	35.86657	244.22	46.1	-7.364	2.962	0.92855	0.220	0.526	1646.
250	34.91412	223.62	43.0	-4.998	5.609	0.93924	0.219	0.533	1589.
260	32.95767	187.85	37.3	-0.235	11.002	0.96039	0.217	0.546	1480.
270	30.95017	159.58	32.3	4.545	16.511	0.98113	0.215	0.556	1382.
280	28.93135	138.83	27.9	9.291	22.093	1.00148	0.213	0.559	1299.
290	26.95660	125.01	24.1	13.935	27.673	1.02107	0.211	0.555	1233.
300	25.09126	116.88	21.0	18.410	33.170	1.03970	0.209	0.543	1185.
320	21.82388	112.21	16.4	26.686	43.656	1.07355	0.205	0.504	1130.
340	19.22717	116.43	13.3	34.025	53.287	1.10276	0.200	0.460	1112.
360	17.20162	124.99	11.2	40.559	62.090	1.12793	0.197	0.422	1114.
380	15.60723	135.57	9.6	46.475	70.205	1.14987	0.194	0.391	1127.
400	14.32700	146.97	8.5	51.932	77.782	1.16931	0.191	0.368	1144.
420	13.27640	158.60	7.6	57.051	84.946	1.18679	0.189	0.350	1165.
440	12.39577	170.19	6.9	61.915	91.790	1.20271	0.188	0.335	1187.
460	11.64738	181.61	6.3	66.585	98.383	1.21737	0.187	0.324	1209.
480	10.99947	192.82	5.8	71.104	104.775	1.23097	0.186	0.315	1231.
500	10.43225	203.82	5.4	75.503	111.004	1.24369	0.185	0.308	1253.
520	9.93041	214.60	5.1	79.803	117.098	1.25564	0.184	0.302	1275.
540	9.48236	225.17	4.8	84.024	123.081	1.26693	0.184	0.297	1297.
560	9.07920	235.55	4.5	88.178	128.970	1.27764	0.184	0.292	1318.
580	8.71398	245.75	4.3	92.276	134.777	1.28783	0.183	0.289	1339.
600	8.38114	255.80	4.1	96.326	140.516	1.29756	0.183	0.295	1360.
650	7.66339	280.27	3.6	106.289	154.617	1.32013	0.183	0.279	1409.
700	7.07154	303.99	3.3	116.077	168.450	1.34064	0.182	0.275	1456.
750	6.57316	327.08	3.0	125.747	182.091	1.35946	0.182	0.271	1501.
800	6.14642	349.66	2.8	135.337	195.593	1.37689	0.183	0.269	1544.
850	5.77606	371.90	2.6	144.879	208.999	1.39314	0.183	0.267	1585.
900	5.45100	393.59	2.4	154.397	222.340	1.40840	0.184	0.266	1625.
950	5.16297	415.08	2.3	163.909	235.642	1.42278	0.185	0.266	1663.
1000	4.90568	436.30	2.1	173.432	248.927	1.43641	0.186	0.266	1699.
1100	4.46475	478.09	1.9	192.560	275.511	1.46175	0.188	0.266	1769.
1200	4.09980	519.21	1.7	211.859	302.194	1.48476	0.191	0.268	1835.
1300	3.79212	559.79	1.6	231.378	329.043	1.50645	0.194	0.269	1898.
1400	3.52892	599.97	1.5	251.147	356.099	1.52650	0.197	0.272	1958.
1500	3.30069	639.32	1.4	271.180	383.386	1.54533	0.200	0.274	2015.
2000	2.49972	835.97	1.0	375.239	523.398	1.62580	0.213	0.286	2277.
2500	2.01460	1029.39	0.803	484.757	668.594	1.69057	0.223	0.295	2509.
3000	1.68812	1221.60	0.668	598.185	817.575	1.74487	0.230	0.301	2723.
3500	1.45305	1413.23	0.572	714.346	969.229	1.79162	0.234	0.305	2921.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

2500 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*120.335	54.63877	2085.59	211.7	-63.678	-55.205	0.58853	0.292	0.452	3870.
125	54.15543	1871.92	197.8	-61.636	-53.087	0.60579	0.290	0.455	3689.
130	53.61615	1683.17	185.2	-59.444	-50.810	0.62366	0.285	0.456	3530.
135	53.05585	1526.67	174.1	-57.257	-48.531	0.64086	0.279	0.455	3398.
140	52.47618	1395.08	164.3	-55.077	-46.255	0.65741	0.273	0.455	3283.
145	51.87910	1282.77	155.2	-52.907	-43.983	0.67336	0.267	0.454	3182.
150	51.26654	1185.42	146.9	-50.745	-41.715	0.68874	0.261	0.453	3089.
155	50.64025	1099.75	139.2	-48.590	-39.448	0.70360	0.256	0.453	3003.
160	50.00165	1023.28	131.9	-46.441	-37.183	0.71799	0.252	0.453	2921.
165	49.35184	954.15	125.0	-44.297	-34.916	0.73194	0.248	0.453	2843.
170	48.69159	890.99	118.6	-42.155	-32.647	0.74548	0.245	0.454	2768.
175	48.02141	832.79	112.4	-40.015	-30.374	0.75866	0.242	0.455	2695.
180	47.34158	778.80	106.6	-37.874	-28.096	0.77150	0.239	0.456	2623.
185	46.65222	728.49	101.1	-35.733	-25.809	0.78403	0.237	0.458	2554.
190	45.95337	681.47	95.9	-33.588	-23.514	0.79627	0.235	0.450	2485.
195	45.24499	637.43	90.9	-31.441	-21.209	0.80825	0.233	0.462	2418.
200	44.52701	596.14	86.2	-29.290	-18.893	0.81997	0.232	0.464	2353.
205	43.79938	557.42	81.7	-27.134	-16.564	0.83147	0.230	0.467	2289.
210	43.06206	521.10	77.3	-24.974	-14.223	0.84275	0.229	0.470	2226.
215	42.31506	487.06	73.2	-22.809	-11.869	0.85383	0.227	0.472	2165.
220	41.55840	455.15	69.3	-20.640	-9.501	0.86472	0.226	0.475	2105.
225	40.79217	425.26	65.6	-18.467	-7.118	0.87543	0.225	0.478	2047.
230	40.01651	357.29	62.0	-16.289	-4.721	0.88597	0.224	0.481	1990.
235	39.23152	371.13	58.6	-14.108	-2.308	0.89635	0.222	0.484	1934.
240	38.43778	346.70	55.3	-11.925	0.119	0.90657	0.221	0.487	1880.
245	37.63539	323.93	52.2	-9.739	2.562	0.91664	0.220	0.490	1828.
250	36.82499	302.76	49.3	-7.552	5.020	0.92657	0.219	0.493	1777.
255	35.18345	265.09	43.8	-3.179	9.979	0.94602	0.217	0.499	1681.
260	33.52255	233.47	38.9	1.179	14.989	0.96493	0.215	0.503	1592.
270	31.85741	207.75	34.5	5.502	20.034	0.98328	0.213	0.505	1512.
280	30.20921	187.71	30.6	9.763	25.088	1.00101	0.211	0.505	1443.
290	28.60316	172.88	27.3	13.933	30.118	1.01807	0.209	0.501	1385.
300									
320	25.61309	155.93	21.9	21.890	39.965	1.04985	0.205	0.482	1303.
340	23.01765	150.79	18.0	29.240	49.352	1.07831	0.201	0.456	1257.
360	20.83935	152.64	15.1	35.977	58.192	1.10358	0.198	0.428	1236.
380	19.03320	158.55	13.0	42.175	66.498	1.12604	0.195	0.403	1231.
400	17.53321	166.77	11.4	47.927	74.331	1.14614	0.193	0.381	1235.
420	16.27653	176.26	10.2	53.326	81.768	1.16428	0.191	0.363	1246.
440	15.21129	186.43	9.2	58.443	88.878	1.18082	0.189	0.348	1260.
460	14.29723	196.91	8.4	63.340	95.720	1.19603	0.188	0.336	1277.
480	13.50370	207.50	7.7	68.059	102.342	1.21012	0.187	0.326	1294.
500	12.80746	218.09	7.1	72.635	108.782	1.22327	0.186	0.318	1313.
520	12.19079	228.61	6.6	77.095	115.070	1.23560	0.186	0.311	1332.
540	11.63999	239.04	6.2	81.459	121.231	1.24723	0.185	0.305	1351.
560	11.14439	249.34	5.9	85.742	127.283	1.25823	0.185	0.300	1370.
580	10.69553	259.53	5.6	89.957	133.241	1.26869	0.184	0.296	1389.
600	10.28662	269.59	5.3	94.115	139.119	1.27865	0.184	0.292	1408.
650	9.40557	294.22	4.7	104.308	153.529	1.30172	0.183	0.285	1455.
700	8.67795	318.18	4.2	114.287	167.622	1.32261	0.183	0.279	1499.
750	8.06961	341.56	3.8	124.117	181.486	1.34175	0.183	0.275	1542.
800	7.54751	364.43	3.5	133.846	195.183	1.35943	0.183	0.273	1584.
850	7.09471	386.87	3.3	143.507	208.759	1.37589	0.184	0.271	1624.
900	6.69751	408.94	3.1	153.129	222.252	1.39131	0.185	0.269	1662.
950	6.34571	430.68	2.9	162.735	235.689	1.40584	0.185	0.268	1699.
1000	6.03155	452.15	2.7	172.341	249.095	1.41960	0.186	0.268	1735.
1100	5.49326	494.40	2.4	191.612	275.887	1.44513	0.189	0.268	1803.
1200	5.04775	535.90	2.2	211.028	302.742	1.46850	0.192	0.269	1868.
1300	4.67207	576.32	2.0	230.646	329.735	1.49010	0.194	0.271	1929.
1400	4.35046	617.27	1.8	250.500	356.913	1.51024	0.197	0.273	1988.
1500	4.07169	657.36	1.7	270.606	384.305	1.52914	0.200	0.275	2044.
2000	3.09141	854.24	1.3	374.916	524.665	1.60732	0.214	0.286	2302.
2500	2.49601	1047.94	1.0	484.581	670.056	1.67467	0.223	0.295	2532.
3000	2.09434	1240.22	0.835	598.103	819.150	1.72902	0.230	0.301	2743.
3500	1.80455	1431.80	0.715	714.329	970.873	1.77579	0.235	0.306	2940.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

3000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*121.633	54.74803	2113.94	205.2	-63.446	-53.299	0.59029	0.299	0.449	3833.
125	54.41632	1961.89	196.1	-61.995	-51.786	0.60256	0.297	0.450	3713.
130	53.90578	1770.30	184.5	-59.839	-49.533	0.62023	0.291	0.451	3562.
135	53.37460	1611.31	174.3	-57.690	-47.282	0.63723	0.285	0.450	3436.
140	52.82437	1477.64	165.2	-55.550	-45.033	0.65358	0.278	0.449	3329.
145	52.25706	1363.69	156.9	-53.420	-42.789	0.66933	0.271	0.448	3233.
150	51.67473	1265.13	149.1	-51.300	-40.549	0.68452	0.265	0.448	3147.
155	51.07929	1178.63	141.8	-49.188	-38.312	0.69919	0.260	0.447	3067.
160	50.47241	1101.63	134.9	-47.083	-36.077	0.71338	0.255	0.447	2991.
165	49.85545	1032.21	128.3	-44.985	-33.842	0.72714	0.251	0.447	2919.
170	49.22947	968.92	122.1	-42.891	-31.607	0.74048	0.247	0.447	2849.
175	48.59523	910.70	116.2	-40.801	-29.369	0.75346	0.244	0.448	2781.
180	47.95331	856.75	110.6	-38.713	-27.128	0.76603	0.242	0.449	2715.
185	47.30408	806.48	105.3	-36.627	-24.893	0.77839	0.239	0.450	2650.
190	46.64783	759.48	100.2	-34.541	-22.632	0.79039	0.237	0.451	2587.
195	45.98474	715.41	95.4	-32.456	-20.375	0.80212	0.235	0.452	2525.
200	45.31499	674.05	90.7	-30.370	-18.111	0.81358	0.233	0.454	2464.
205	44.63873	635.19	86.3	-28.284	-15.839	0.82480	0.232	0.455	2405.
210	43.95613	598.69	82.1	-26.198	-13.560	0.83578	0.230	0.457	2346.
215	43.26738	564.40	78.1	-24.111	-11.272	0.84655	0.229	0.458	2290.
220	42.57273	532.20	74.2	-22.025	-8.976	0.85711	0.227	0.460	2234.
225	41.87245	502.00	70.6	-19.939	-6.671	0.86747	0.226	0.462	2180.
230	41.16688	473.67	67.1	-17.853	-4.358	0.87763	0.225	0.463	2128.
235	40.45638	447.12	63.7	-15.769	-2.038	0.88761	0.223	0.465	2077.
240	39.74139	422.27	60.6	-13.688	0.291	0.89742	0.222	0.467	2027.
245	39.02241	399.03	57.5	-11.609	2.628	0.90705	0.221	0.468	1979.
250	38.29998	377.32	54.6	-9.534	4.971	0.91652	0.220	0.469	1932.
260	36.84746	338.25	49.3	-5.400	9.677	0.93498	0.217	0.472	1844.
270	35.39021	304.65	44.4	-1.294	14.404	0.95282	0.215	0.473	1762.
280	33.93658	276.19	40.0	2.772	19.142	0.97005	0.213	0.474	1687.
290	32.49710	252.61	36.1	6.784	23.879	0.98667	0.211	0.473	1620.
300	31.08413	233.59	32.6	10.728	28.600	1.00268	0.209	0.471	1561.
320	28.38973	207.54	26.8	18.349	37.917	1.03275	0.206	0.460	1467.
340	25.94219	174.08	22.4	25.544	46.958	1.06016	0.202	0.443	1404.
360	23.78603	189.22	19.0	32.277	55.633	1.08496	0.199	0.424	1366.
380	21.92039	189.93	16.4	38.570	63.913	1.10735	0.197	0.404	1345.
400	20.31755	194.20	14.4	44.471	71.814	1.12761	0.194	0.386	1337.
420	18.94012	200.73	12.8	50.040	79.371	1.14605	0.192	0.370	1337.
440	17.75089	208.68	11.5	55.332	86.628	1.16293	0.191	0.356	1343.
460	16.71703	217.53	10.5	60.396	93.627	1.17849	0.190	0.344	1353.
480	15.81122	226.90	9.6	65.272	100.407	1.19292	0.189	0.334	1365.
500	15.01130	236.59	8.9	69.993	107.001	1.20638	0.188	0.326	1379.
520	14.29951	246.44	8.3	74.586	113.436	1.21900	0.187	0.318	1394.
540	13.66165	256.37	7.8	79.072	119.735	1.23039	0.186	0.312	1410.
560	13.08634	266.30	7.3	83.466	125.918	1.24213	0.186	0.306	1427.
580	12.56436	276.21	6.9	87.784	132.000	1.25280	0.185	0.302	1444.
600	12.08923	286.07	6.5	92.037	137.993	1.26296	0.185	0.298	1461.
650	11.06083	310.42	5.8	102.437	152.663	1.28645	0.184	0.290	1503.
700	10.21363	334.29	5.2	112.589	166.981	1.30768	0.184	0.284	1545.
750	9.50053	357.68	4.7	122.567	181.041	1.32708	0.184	0.279	1586.
800	8.89030	380.64	4.3	132.422	194.910	1.34498	0.184	0.276	1625.
850	8.36093	403.21	4.0	142.195	208.639	1.36163	0.185	0.273	1664.
900	7.89647	425.42	3.7	151.915	222.267	1.37721	0.185	0.272	1701.
950	7.48502	447.31	3.5	161.607	235.827	1.39187	0.186	0.271	1737.
1000	7.11751	468.94	3.3	171.292	249.344	1.40574	0.187	0.270	1771.
1100	6.48764	511.48	2.9	190.697	276.326	1.43145	0.189	0.270	1833.
1200	5.96606	553.25	2.6	210.225	303.341	1.45496	0.192	0.271	1901.
1300	5.52600	594.41	2.4	229.937	330.468	1.47667	0.195	0.272	1961.
1400	5.14906	635.08	2.2	249.871	357.762	1.49690	0.198	0.274	2017.
1500	4.82212	675.35	2.1	270.047	385.253	1.51586	0.201	0.276	2074.
2000	3.67047	872.80	1.5	374.600	525.953	1.59674	0.214	0.297	2329.
2500	2.96832	1066.72	1.2	484.408	671.525	1.66168	0.223	0.295	2555.
3000	2.49447	1259.03	1.0	598.022	820.729	1.71606	0.230	0.301	2764.
3500	2.15150	1450.54	0.858	714.311	972.520	1.76285	0.235	0.306	2959.

THERMODYNAMIC PROPERTIES OF NITROGEN

3500 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*122.920	54.86060	2144.72	199.3	-63.206	-51.392	0.59207	0.305	0.445	3808.
125	54.66550	2051.97	194.3	-62.323	-50.467	0.59953	0.303	0.445	3739.
130	54.18149	1857.38	183.7	-60.201	-48.238	0.61701	0.297	0.446	3595.
135	53.67705	1695.64	174.4	-58.087	-46.012	0.63382	0.284	0.445	3476.
140	53.15367	1559.71	166.0	-55.983	-43.790	0.64998	0.282	0.444	3374.
145	52.61333	1443.87	158.3	-53.891	-41.572	0.66555	0.275	0.443	3284.
150	52.05812	1347.83	151.0	-51.808	-39.358	0.68056	0.268	0.442	3203.
155	51.49010	1256.23	144.2	-49.735	-37.148	0.69505	0.263	0.442	3129.
160	50.91111	1176.47	137.6	-47.670	-34.940	0.70907	0.258	0.441	3058.
165	50.32272	1108.55	131.4	-45.612	-32.733	0.72266	0.253	0.441	2991.
170	49.72619	1044.95	125.4	-43.560	-30.526	0.73583	0.250	0.441	2926.
175	49.12251	986.55	119.8	-41.513	-28.319	0.74863	0.246	0.442	2862.
180	48.51243	932.50	114.3	-39.470	-26.110	0.76107	0.243	0.442	2801.
185	47.89655	882.17	109.1	-37.430	-23.898	0.77319	0.241	0.443	2746.
190	47.27528	835.09	104.2	-35.393	-21.683	0.78501	0.239	0.443	2681.
195	46.64999	790.94	99.5	-33.359	-19.465	0.79653	0.237	0.444	2623.
200	46.01796	749.43	94.9	-31.326	-17.242	0.80779	0.235	0.445	2566.
205	45.38247	710.38	90.6	-29.296	-15.015	0.81879	0.233	0.446	2510.
210	44.74276	673.63	86.5	-27.268	-12.783	0.82954	0.231	0.447	2455.
215	44.09913	639.04	82.5	-25.243	-10.546	0.84007	0.230	0.448	2402.
220	43.45186	606.49	78.7	-23.220	-8.304	0.85038	0.228	0.449	2350.
225	42.80130	575.89	75.1	-21.200	-6.057	0.86048	0.227	0.450	2299.
230	42.14780	547.13	71.7	-19.183	-3.806	0.87037	0.226	0.451	2250.
235	41.49177	520.11	68.4	-17.171	-1.550	0.88007	0.224	0.451	2202.
240	40.83363	494.76	65.2	-15.163	0.709	0.88959	0.223	0.452	2156.
245	40.17386	470.98	62.2	-13.161	2.972	0.89892	0.222	0.453	2110.
250	39.51297	448.71	59.3	-11.166	5.237	0.90807	0.221	0.453	2067.
255	38.85100	428.36	56.0	-9.196	7.775	0.91687	0.218	0.454	1984.
260	38.19002	408.36	54.0	-7.262	10.317	0.92587	0.216	0.454	1907.
265	37.52894	388.85	51.2	-5.357	12.857	0.93502	0.214	0.454	1836.
270	36.86954	370.21	48.2	-3.482	15.399	0.94432	0.212	0.452	1771.
275	36.21094	352.45	45.2	-1.637	17.941	0.95377	0.210	0.450	1712.
280	35.55274	335.69	42.2	0.168	20.483	0.96337	0.208	0.448	1658.
285	34.89494	319.93	39.2	1.973	23.025	0.97312	0.206	0.446	1609.
290	34.23754	305.17	36.2	3.788	25.567	0.98302	0.204	0.444	1565.
295	33.58054	291.41	33.2	5.603	28.109	0.99307	0.202	0.442	1526.
300	32.92394	278.65	30.2	7.418	30.651	1.00327	0.200	0.440	1491.
320	30.52303	262.62	31.2	15.600	36.831	1.01954	0.206	0.442	1615.
340	28.26565	242.45	26.4	22.617	45.563	1.04601	0.203	0.430	1543.
360	26.17497	231.54	22.7	29.271	54.033	1.07022	0.200	0.416	1494.
380	24.32877	227.20	19.7	35.565	62.205	1.09232	0.198	0.401	1461.
400	22.69915	227.37	17.4	41.522	70.075	1.11251	0.195	0.386	1442.
420	21.26642	230.62	15.5	47.180	77.656	1.13100	0.194	0.372	1433.
440	20.00645	235.97	13.9	52.579	84.974	1.14803	0.192	0.360	1431.
460	18.89511	242.76	12.7	57.757	92.058	1.16377	0.191	0.349	1434.
480	17.91039	250.51	11.6	62.747	98.935	1.17841	0.190	0.339	1441.
500	17.03321	258.92	10.7	67.580	105.631	1.19208	0.189	0.331	1456.
520	16.24745	267.76	10.0	72.279	112.170	1.20490	0.188	0.323	1461.
540	15.53965	276.88	9.3	76.865	118.573	1.21699	0.187	0.317	1474.
560	14.89865	286.18	8.7	81.353	124.856	1.22841	0.187	0.311	1487.
580	14.31523	295.53	8.2	85.759	131.034	1.23925	0.186	0.307	1501.
600	13.78171	305.04	7.8	90.093	137.121	1.24957	0.186	0.302	1516.
620	13.26276	314.69	7.4	94.357	143.118	1.25937	0.185	0.298	1531.
640	12.75476	324.49	7.0	98.551	149.025	1.26867	0.185	0.294	1546.
660	12.25776	334.44	6.6	102.685	154.842	1.27737	0.185	0.290	1561.
680	11.77176	344.54	6.2	106.759	160.569	1.28557	0.185	0.286	1576.
700	11.29676	354.79	5.8	110.783	166.206	1.29327	0.185	0.282	1591.
720	10.83276	365.19	5.4	114.757	171.753	1.30047	0.185	0.278	1606.
740	10.37976	375.74	5.0	118.681	177.210	1.30717	0.185	0.274	1621.
760	9.93776	386.44	4.6	122.555	182.577	1.31337	0.185	0.270	1636.
780	9.50576	397.29	4.2	126.379	187.854	1.31907	0.185	0.266	1651.
800	9.08376	408.29	3.8	130.153	193.041	1.32427	0.185	0.262	1666.
820	8.67176	419.44	3.4	133.877	198.138	1.32897	0.185	0.258	1681.
840	8.27076	430.74	3.0	137.551	203.145	1.33317	0.185	0.254	1696.
860	7.88076	442.19	2.6	141.175	208.062	1.33687	0.185	0.250	1711.
880	7.50176	453.79	2.2	144.749	212.889	1.34007	0.185	0.246	1726.
900	7.13376	465.54	1.8	148.273	217.626	1.34277	0.185	0.242	1741.
920	6.77676	477.44	1.4	151.747	222.273	1.34497	0.185	0.238	1756.
940	6.43076	489.49	1.0	155.171	226.830	1.34667	0.185	0.234	1771.
960	6.09576	501.69	0.6	158.545	231.297	1.34787	0.185	0.230	1786.
980	5.77176	514.04	0.2	161.869	235.674	1.34857	0.185	0.226	1801.
1000	5.45876	526.54	0.0	165.143	239.961	1.34877	0.185	0.222	1816.
1020	5.15676	539.19	0.0	168.367	244.158	1.34847	0.185	0.218	1831.
1040	4.86576	551.99	0.0	171.541	248.265	1.34767	0.185	0.214	1846.
1060	4.58576	564.84	0.0	174.665	252.282	1.34627	0.185	0.210	1861.
1080	4.31676	577.74	0.0	177.739	256.209	1.34437	0.185	0.206	1876.
1100	4.05876	590.79	0.0	180.763	260.046	1.34197	0.185	0.202	1891.
1120	3.81176	603.99	0.0	183.737	263.793	1.33907	0.185	0.198	1906.
1140	3.57576	617.34	0.0	186.661	267.450	1.33567	0.185	0.194	1921.
1160	3.35076	630.84	0.0	189.535	271.017	1.33177	0.185	0.190	1936.
1180	3.13676	644.49	0.0	192.359	274.494	1.32737	0.185	0.186	1951.
1200	2.93376	658.29	0.0	195.133	277.881	1.32247	0.185	0.182	1966.
1220	2.74176	672.24	0.0	197.857	281.178	1.31707	0.185	0.178	1981.
1240	2.56076	686.34	0.0	200.531	284.385	1.31117	0.185	0.174	1996.
1260	2.39076	700.59	0.0	203.155	287.502	1.30477	0.185	0.170	2011.
1280	2.23176	715.09	0.0	205.729	290.529	1.29787	0.185	0.166	2026.
1300	2.08376	729.84	0.0	208.253	293.466	1.29047	0.185	0.162	2041.
1320	1.94676	744.84	0.0	210.727	296.313	1.28257	0.185	0.158	2056.
1340	1.82076	760.09	0.0	213.151	299.070	1.27417	0.185	0.154	2071.
1360	1.70576	775.59	0.0	215.525	301.737	1.26527	0.185	0.150	2086.
1380	1.60176	791.34	0.0	217.849	304.314	1.25587	0.185	0.146	2101.
1400	1.50876	807.34	0.0	220.123	306.801	1.24597	0.185	0.142	2116.
1420	1.42676	823.59	0.0	222.347	309.198	1.23557	0.185	0.138	2131.
1440	1.35476	840.09	0.0	224.521	311.505	1.22467	0.185	0.134	2146.
1460	1.29276	856.84	0.0	226.645	313.722	1.21327	0.185	0.130	2161.
1480	1.24076	873.84	0.0	228.719	315.849	1.20137	0.185	0.126	2176.
1500	1.19876	891.09	0.0	230.743	317.886	1.18897	0.185	0.122	2191.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

4000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*124.197	54.97578	2177.67	194.1	-62.960	-49.486	0.59395	0.309	0.441	3793.
125	54.90396	2142.25	192.4	-62.623	-49.132	0.59669	0.308	0.441	3768.
130	54.44456	1944.52	182.7	-60.532	-46.927	0.61399	0.301	0.441	3630.
135	53.96482	1779.95	174.3	-58.451	-44.725	0.63061	0.294	0.440	3516.
140	53.46613	1641.45	166.6	-56.381	-42.527	0.64660	0.286	0.439	3419.
145	52.95040	1523.49	159.5	-54.323	-40.334	0.66199	0.278	0.438	3334.
150	52.41979	1421.74	152.8	-52.275	-38.145	0.67683	0.271	0.437	3258.
155	51.87643	1332.82	146.4	-50.238	-35.959	0.69116	0.265	0.437	3188.
160	51.32230	1254.08	140.2	-48.209	-33.776	0.70503	0.260	0.436	3122.
165	50.75913	1183.46	134.2	-46.187	-31.594	0.71845	0.256	0.436	3055.
170	50.18835	1119.39	128.5	-44.172	-29.413	0.73148	0.252	0.436	2998.
175	49.61112	1060.66	123.1	-42.162	-27.232	0.74412	0.248	0.436	2939.
180	49.02837	1006.39	117.8	-40.158	-25.050	0.75641	0.245	0.436	2881.
185	48.44080	955.90	112.3	-38.159	-22.868	0.76837	0.243	0.437	2824.
190	47.84899	908.69	107.9	-36.163	-20.683	0.78003	0.240	0.437	2768.
195	47.25338	864.39	103.3	-34.172	-18.496	0.79139	0.238	0.438	2713.
200	46.65437	822.71	98.8	-32.184	-16.307	0.80247	0.236	0.438	2660.
205	46.05227	783.45	94.6	-30.200	-14.116	0.81329	0.234	0.439	2607.
210	45.44741	746.43	90.5	-28.220	-11.922	0.82387	0.233	0.439	2555.
215	44.84009	711.52	86.6	-26.244	-9.725	0.83421	0.231	0.440	2505.
220	44.23063	678.60	82.8	-24.272	-7.525	0.84432	0.230	0.440	2455.
225	43.61936	647.58	79.3	-22.305	-5.323	0.85422	0.228	0.441	2407.
230	43.00664	618.36	75.9	-20.343	-3.119	0.86390	0.227	0.441	2361.
235	42.39284	590.85	72.6	-18.386	-0.913	0.87339	0.225	0.441	2315.
240	41.77836	564.97	69.5	-16.436	1.294	0.88269	0.224	0.442	2271.
245	41.16361	540.64	66.5	-14.493	3.502	0.89179	0.223	0.442	2228.
250	40.54905	517.78	63.6	-12.557	5.710	0.90071	0.222	0.442	2187.
255	39.93223	496.19	60.3	-10.621	7.918	0.90934	0.221	0.441	2147.
260	39.32234	476.19	58.3	-8.711	10.126	0.91804	0.219	0.441	2108.
265	38.71021	457.67	56.4	-6.803	12.334	0.92688	0.217	0.441	2070.
270	38.10211	439.67	53.4	-4.903	14.538	0.93568	0.215	0.440	2034.
275	37.49825	422.76	50.4	-3.003	16.740	0.94452	0.213	0.438	1998.
280	36.89255	407.76	49.0	-1.138	18.940	0.95309	0.213	0.438	1966.
285	36.28912	393.05	45.0	0.717	21.136	0.96169	0.211	0.435	1933.
290	35.69812	380.05	45.0	2.577	23.326	0.96609	0.211	0.435	1896.
295	35.11812	367.22	41.4	4.437	25.512	0.97039	0.211	0.435	1866.
300	34.52354	356.22	41.4	6.237	27.693	0.97469	0.211	0.435	1836.
320	32.25324	318.93	35.2	13.371	36.337	1.00879	0.207	0.429	1749.
340	30.11831	293.48	30.2	20.227	44.821	1.03451	0.204	0.419	1672.
360	28.14686	277.42	26.1	26.783	53.099	1.05817	0.201	0.408	1615.
380	26.35317	268.45	22.9	33.035	61.142	1.07991	0.199	0.396	1575.
400	24.73777	264.68	20.2	38.997	68.940	1.09991	0.197	0.384	1547.
420	23.29121	264.62	18.1	44.693	76.496	1.11835	0.195	0.372	1530.
440	21.99955	267.24	16.3	50.152	83.823	1.13540	0.193	0.361	1521.
460	20.84284	271.77	14.9	55.403	90.941	1.15122	0.192	0.351	1513.
480	19.80728	277.67	13.6	60.474	97.870	1.16596	0.191	0.342	1515.
500	18.87631	284.56	12.6	65.388	104.629	1.17976	0.190	0.334	1523.
520	18.03609	292.15	11.7	70.169	111.237	1.19272	0.189	0.327	1530.
540	17.27463	300.25	10.9	74.834	117.713	1.20494	0.188	0.321	1539.
560	16.58161	308.71	10.2	79.399	124.070	1.21650	0.188	0.315	1550.
580	15.94828	317.41	9.6	83.878	130.323	1.22747	0.187	0.310	1561.
600	15.36717	326.29	9.1	88.282	136.483	1.23791	0.187	0.306	1574.
650	14.10368	348.90	8.0	99.022	151.542	1.26203	0.186	0.297	1607.
700	13.05360	371.71	7.2	109.467	166.211	1.28377	0.185	0.290	1641.
750	12.16511	394.46	6.5	119.699	180.587	1.30361	0.185	0.285	1677.
800	11.40195	417.04	5.9	129.776	194.740	1.32188	0.185	0.281	1712.
850	10.73310	439.40	5.5	139.745	208.725	1.33884	0.186	0.278	1746.
900	10.15438	461.52	5.1	149.640	222.585	1.35468	0.186	0.276	1780.
950	9.63636	483.40	4.7	159.489	236.355	1.36957	0.187	0.275	1813.
1000	9.17299	505.07	4.4	169.314	250.064	1.38364	0.188	0.274	1846.
1100	8.37730	547.78	4.0	188.964	277.383	1.40958	0.190	0.273	1908.
1200	7.71698	589.78	3.6	208.697	304.682	1.43343	0.193	0.273	1963.
1300	7.15881	631.18	3.3	228.584	332.053	1.45534	0.196	0.274	2025.
1400	6.67985	672.08	3.0	248.663	359.556	1.47572	0.198	0.276	2081.
1500	6.26376	712.56	2.8	268.974	387.228	1.49481	0.201	0.278	2134.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

4500 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCURE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*125.464	55.09297	2212.52	189.4	-62.707	-47.581	0.59563	0.313	0.437	3784.
130	54.69609	2031.81	181.6	-60.836	-45.601	0.61114	0.306	0.436	3665.
135	54.23928	1864.21	174.0	-58.785	-43.422	0.62759	0.297	0.435	3556.
140	53.76341	1723.01	167.1	-56.747	-41.247	0.64340	0.289	0.434	3464.
145	53.27034	1602.72	160.6	-54.721	-39.078	0.65862	0.281	0.433	3383.
150	52.76223	1499.06	154.4	-52.706	-36.913	0.67331	0.274	0.433	3311.
155	52.24128	1408.61	148.4	-50.701	-34.750	0.68749	0.268	0.432	3245.
160	51.70957	1328.69	142.6	-48.705	-32.590	0.70121	0.262	0.432	3183.
165	51.16896	1257.18	136.9	-46.716	-30.431	0.71449	0.258	0.432	3124.
170	50.62101	1192.47	131.4	-44.735	-28.273	0.72739	0.254	0.432	3067.
175	50.06704	1133.29	126.2	-42.759	-26.115	0.73989	0.250	0.432	3011.
180	49.50810	1078.70	121.1	-40.790	-23.958	0.75204	0.247	0.432	2956.
185	48.94502	1027.96	116.1	-38.825	-21.800	0.76387	0.244	0.432	2903.
190	48.37848	980.56	111.4	-36.866	-19.641	0.77538	0.242	0.432	2850.
195	47.80901	936.06	106.9	-34.911	-17.482	0.78660	0.239	0.432	2798.
200	47.23705	894.19	102.5	-32.962	-15.321	0.79754	0.237	0.432	2747.
205	46.66300	854.69	98.3	-31.017	-13.159	0.80822	0.235	0.433	2697.
210	46.08719	817.40	94.3	-29.077	-10.996	0.81864	0.234	0.433	2648.
215	45.50995	782.18	90.4	-27.142	-8.832	0.82883	0.232	0.433	2600.
220	44.93159	748.90	86.7	-25.212	-6.666	0.83878	0.231	0.433	2553.
225	44.35243	717.47	83.1	-23.289	-4.500	0.84852	0.229	0.433	2507.
230	43.77281	687.80	79.7	-21.371	-2.334	0.85804	0.228	0.433	2462.
235	43.19306	659.80	76.5	-19.460	-0.167	0.86736	0.226	0.433	2419.
240	42.61354	633.40	73.4	-17.556	1.999	0.87648	0.225	0.433	2376.
245	42.03463	608.52	70.4	-15.660	4.165	0.88541	0.224	0.433	2335.
250	41.45669	585.09	67.6	-13.771	6.329	0.89416	0.223	0.433	2295.
260	40.30533	542.28	62.2	-10.022	10.653	0.91112	0.220	0.432	2220.
270	39.16266	504.47	57.4	-6.312	14.966	0.92740	0.218	0.431	2149.
280	38.03200	471.16	52.9	-2.646	19.265	0.94303	0.216	0.429	2083.
290	36.91670	441.94	48.9	0.973	23.545	0.95805	0.214	0.427	2022.
300	35.82014	416.45	45.2	4.539	27.803	0.97249	0.212	0.424	1966.
320	33.69660	375.41	38.9	11.503	36.233	0.99969	0.208	0.418	1869.
340	31.68651	345.76	33.6	18.221	44.520	1.02481	0.205	0.410	1791.
360	29.81002	325.38	29.4	24.680	52.634	1.04800	0.202	0.401	1729.
380	28.07929	312.34	25.9	30.876	60.552	1.06941	0.200	0.391	1682.
400	26.49765	304.90	23.0	36.818	68.266	1.08920	0.198	0.380	1649.
420	25.06098	301.66	20.6	42.522	75.773	1.10751	0.196	0.370	1626.
440	23.76016	301.56	18.6	48.010	83.081	1.12451	0.194	0.361	1611.
460	22.58347	303.77	17.0	53.304	90.203	1.14035	0.193	0.352	1602.
480	21.51831	307.72	15.6	58.428	97.153	1.15514	0.192	0.343	1593.
500	20.55234	312.96	14.4	63.401	103.947	1.16900	0.191	0.336	1598.
520	19.67405	319.16	13.4	68.243	110.598	1.18205	0.190	0.329	1601.
540	18.87309	326.09	12.5	72.970	117.123	1.19436	0.189	0.323	1607.
560	18.14027	333.56	11.7	77.596	123.533	1.20602	0.189	0.318	1614.
580	17.46757	341.42	11.0	82.135	129.841	1.21708	0.188	0.313	1623.
600	16.84801	349.59	10.4	86.596	136.057	1.22762	0.188	0.309	1633.
650	15.49401	370.86	9.1	97.472	151.255	1.25196	0.187	0.300	1661.
700	14.36245	392.76	8.2	108.038	166.058	1.27390	0.186	0.293	1692.
750	13.40126	414.89	7.4	118.377	180.558	1.29391	0.186	0.287	1724.
800	12.57328	437.04	6.7	128.550	194.826	1.31233	0.186	0.283	1750.
850	11.85146	459.09	6.2	138.605	208.917	1.32941	0.186	0.280	1739.
900	11.21568	481.00	5.8	148.577	222.875	1.34537	0.187	0.278	1821.
950	10.65068	502.74	5.4	158.496	236.735	1.36036	0.188	0.276	1853.
1000	10.14448	524.31	5.0	168.384	250.526	1.37451	0.188	0.275	1884.
1100	9.27457	566.92	4.5	188.145	277.993	1.40069	0.191	0.274	1944.
1200	8.55137	608.89	4.0	207.972	305.419	1.42455	0.193	0.274	2002.
1300	7.93926	650.30	3.7	227.939	332.899	1.44655	0.196	0.275	2058.
1400	7.41345	691.23	3.4	248.093	360.497	1.46700	0.199	0.277	2112.
1500	6.95620	731.75	3.1	268.460	388.253	1.48615	0.202	0.278	2164.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

5000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU. FT-PSIA/LB	ISOCORIC DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP LB - R	VELOCITY OF SOUND FT/SEC
*126.720	55.21163	2249.05	185.2	-62.449	-45.679	0.59741	0.315	0.432	3782.
130	54.93703	2119.31	180.3	-61.115	-44.261	0.60845	0.310	0.432	3701.
135	54.50160	1948.57	173.5	-59.092	-42.104	0.62473	0.301	0.431	3596.
140	54.04694	1804.50	167.4	-57.084	-39.953	0.64038	0.292	0.430	3508.
145	53.57486	1681.72	161.5	-55.089	-37.806	0.65544	0.284	0.429	3431.
150	53.08749	1575.94	155.8	-53.104	-35.664	0.66997	0.277	0.428	3363.
155	52.58708	1483.76	150.2	-51.130	-33.523	0.68401	0.270	0.428	3300.
160	52.07579	1402.47	144.3	-49.164	-31.385	0.69759	0.264	0.428	3242.
165	51.55557	1329.92	139.4	-47.206	-29.247	0.71074	0.259	0.427	3186.
170	51.02812	1264.41	134.2	-45.255	-27.110	0.72350	0.255	0.427	3132.
175	50.49487	1204.65	129.1	-43.310	-24.974	0.73589	0.251	0.427	3079.
180	49.95697	1149.63	124.1	-41.372	-22.838	0.74792	0.248	0.427	3023.
185	49.41535	1098.57	119.3	-39.439	-20.702	0.75963	0.245	0.427	2977.
190	48.87037	1050.90	114.7	-37.511	-18.566	0.77102	0.243	0.427	2927.
195	48.32403	1006.19	110.2	-35.589	-16.429	0.78212	0.241	0.427	2878.
200	47.77537	964.08	105.9	-33.673	-14.293	0.79294	0.238	0.427	2829.
205	47.22531	924.34	101.8	-31.762	-12.156	0.80349	0.237	0.427	2782.
210	46.67422	886.79	97.8	-29.856	-10.019	0.81379	0.235	0.427	2735.
215	46.12243	851.26	94.0	-27.956	-7.882	0.82385	0.233	0.427	2689.
220	45.57025	817.64	90.3	-26.063	-5.745	0.83367	0.232	0.427	2644.
225	45.01799	785.82	86.8	-24.175	-3.608	0.84328	0.230	0.427	2600.
230	44.46596	755.72	83.4	-22.295	-1.472	0.85266	0.229	0.427	2557.
235	43.91446	727.25	80.2	-20.422	0.662	0.86185	0.227	0.427	2515.
240	43.36381	700.35	77.1	-18.556	2.796	0.87083	0.226	0.427	2474.
245	42.81433	674.94	74.1	-16.698	4.927	0.87962	0.225	0.426	2434.
250	42.26635	650.95	71.2	-14.849	7.057	0.88822	0.224	0.426	2396.
260	41.17621	606.98	65.9	-11.179	11.307	0.90490	0.221	0.424	2322.
270	40.09608	567.92	61.0	-7.548	15.544	0.92088	0.219	0.423	2254.
280	39.02864	533.32	56.5	-3.961	19.763	0.93623	0.217	0.421	2190.
290	37.97653	502.74	52.5	-0.419	23.961	0.95096	0.215	0.419	2131.
300	36.94236	475.82	48.7	3.072	28.135	0.96511	0.213	0.416	2076.
320	34.93759	431.64	42.3	9.897	36.399	0.99178	0.209	0.410	1980.
340	33.03243	398.52	36.9	16.499	44.525	1.01643	0.206	0.403	1900.
360	31.24143	374.52	32.4	22.869	52.506	1.03923	0.203	0.395	1836.
380	29.57407	357.91	28.7	29.006	60.313	1.06033	0.201	0.386	1785.
400	28.03409	347.15	25.6	34.915	67.943	1.07990	0.199	0.377	1747.
420	26.61987	340.93	23.1	40.611	75.393	1.09808	0.197	0.368	1719.
440	25.32579	338.20	20.9	46.109	82.668	1.11500	0.195	0.360	1699.
460	24.14366	338.13	19.1	51.428	89.777	1.13081	0.194	0.351	1685.
480	23.06405	340.11	17.5	56.585	96.729	1.14560	0.193	0.344	1677.
500	22.07724	343.64	16.2	61.599	103.537	1.15950	0.192	0.337	1673.
520	21.17380	348.38	15.1	66.485	110.213	1.17259	0.191	0.331	1673.
540	20.34492	354.04	14.1	71.259	116.769	1.18496	0.190	0.325	1675.
560	19.58261	360.42	13.2	75.934	123.215	1.19668	0.189	0.320	1679.
580	18.87967	367.35	12.4	80.521	129.563	1.20782	0.189	0.315	1665.
600	18.22774	374.71	11.7	85.030	135.821	1.21843	0.188	0.311	1693.
650	16.80159	394.40	10.3	96.021	151.125	1.24294	0.187	0.302	1716.
700	15.60080	415.20	9.2	106.692	166.041	1.26505	0.187	0.295	1743.
750	14.57628	436.54	8.3	117.126	180.646	1.28520	0.187	0.290	1772.
800	13.69084	458.12	7.6	127.386	195.014	1.30375	0.187	0.285	1802.
850	12.91695	479.75	7.0	137.518	209.199	1.32095	0.187	0.282	1832.
900	12.23393	501.36	6.4	147.561	223.244	1.33700	0.187	0.280	1862.
950	11.62595	522.87	6.0	157.544	237.185	1.35208	0.188	0.278	1892.
1000	11.08071	544.27	5.6	167.492	251.051	1.36631	0.189	0.277	1922.
1100	10.14160	586.66	5.0	187.356	278.653	1.39261	0.191	0.276	1930.
1200	9.35964	628.51	4.5	207.272	306.196	1.41658	0.193	0.275	2036.
1300	8.69684	669.87	4.1	227.315	333.778	1.43866	0.196	0.276	2070.
1400	8.12679	710.77	3.8	247.535	361.466	1.45917	0.199	0.278	2153.
1500	7.63056	751.29	3.5	267.961	389.301	1.47838	0.202	0.279	2194.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

6000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*129.204	55.45162	2326.39	178.2	-61.920	-41.883	0.60091	0.318	0.424	3793.
130	55.39034	2295.21	177.4	-61.605	-41.546	0.60352	0.316	0.424	3775.
135	54.99374	2117.86	172.2	-59.635	-39.432	0.61947	0.306	0.422	3677.
140	54.57748	1967.68	167.5	-57.682	-37.324	0.63480	0.297	0.421	3595.
145	54.14323	1833.43	162.8	-55.743	-35.222	0.64956	0.288	0.420	3525.
150	53.69307	1729.93	159.2	-53.815	-33.122	0.66380	0.280	0.420	3463.
155	53.22926	1632.78	153.4	-51.897	-31.023	0.67756	0.274	0.420	3407.
160	52.75407	1549.25	149.7	-49.987	-28.925	0.69088	0.268	0.420	3354.
165	52.26959	1473.11	143.9	-48.084	-26.827	0.70379	0.262	0.420	3304.
170	51.77773	1405.59	139.2	-46.187	-24.729	0.71632	0.258	0.420	3255.
175	51.28010	1344.29	134.4	-44.297	-22.630	0.72849	0.254	0.420	3208.
180	50.77807	1289.09	129.8	-42.412	-20.531	0.74031	0.251	0.420	3161.
185	50.27275	1236.13	125.3	-40.534	-18.433	0.75181	0.248	0.420	3115.
190	49.76507	1187.75	120.8	-38.661	-16.334	0.76301	0.245	0.420	3070.
195	49.25576	1142.43	116.5	-36.794	-14.236	0.77390	0.243	0.420	3025.
200	48.74543	1099.80	112.3	-34.933	-12.139	0.78452	0.241	0.419	2981.
205	48.23456	1059.55	108.3	-33.077	-10.043	0.79488	0.239	0.419	2937.
210	47.72358	1021.47	104.4	-31.229	-7.947	0.80498	0.237	0.419	2893.
215	47.21282	985.36	100.6	-29.387	-5.853	0.81483	0.235	0.419	2851.
220	46.70262	951.10	97.0	-27.551	-3.761	0.82445	0.234	0.418	2809.
225	46.19324	918.58	93.5	-25.723	-1.670	0.83385	0.232	0.418	2768.
230	45.68496	887.71	90.1	-23.902	0.419	0.84303	0.231	0.417	2728.
235	45.17804	858.40	86.9	-22.088	2.505	0.85200	0.229	0.417	2685.
240	44.67272	830.59	83.8	-20.283	4.588	0.86073	0.228	0.416	2650.
245	44.16925	804.21	80.8	-18.486	6.668	0.86935	0.227	0.416	2613.
250	43.66788	779.20	78.0	-16.698	8.745	0.87775	0.226	0.415	2577.
260	42.67241	733.05	72.6	-13.150	12.837	0.89399	0.223	0.413	2507.
270	41.68822	691.69	67.6	-9.641	17.011	0.90955	0.221	0.411	2442.
280	40.71718	654.69	63.1	-6.174	21.114	0.92448	0.219	0.409	2381.
290	39.76108	621.66	58.9	-2.750	25.194	0.93879	0.217	0.407	2324.
300	38.82159	592.21	55.1	0.628	29.248	0.95254	0.215	0.404	2271.
320	36.99844	542.76	48.4	7.242	37.272	0.97843	0.211	0.398	2176.
340	35.25828	504.06	42.7	13.660	45.173	1.00238	0.208	0.392	2096.
360	33.60920	474.25	38.0	19.882	52.940	1.02458	0.205	0.385	2029.
380	32.05655	451.80	34.0	25.907	60.567	1.04520	0.203	0.378	1974.
400	30.60285	435.39	30.6	31.744	68.050	1.06440	0.201	0.371	1929.
420	29.24790	423.88	27.7	37.400	75.388	1.08230	0.199	0.363	1894.
440	27.98911	416.33	25.2	42.987	82.584	1.09904	0.197	0.356	1867.
460	26.82211	411.94	23.1	48.218	89.642	1.11473	0.196	0.350	1846.
480	25.74138	410.03	21.3	53.407	96.570	1.12947	0.195	0.343	1831.
500	24.74075	410.22	19.7	58.466	103.374	1.14336	0.194	0.337	1820.
520	23.81387	411.96	18.4	63.407	110.064	1.15648	0.193	0.332	1813.
540	22.95445	414.99	17.2	68.243	116.647	1.16890	0.192	0.327	1810.
560	22.15654	419.05	16.1	72.985	123.131	1.18069	0.191	0.322	1809.
580	21.41454	423.95	15.2	77.641	129.525	1.19191	0.190	0.319	1810.
600	20.72333	429.51	14.3	82.222	135.836	1.20261	0.190	0.314	1813.
650	19.18791	445.59	12.6	93.389	151.294	1.22736	0.189	0.305	1826.
700	17.88059	463.73	11.2	104.230	166.368	1.24971	0.188	0.298	1846.
750	16.75453	483.10	10.1	114.823	181.138	1.27009	0.188	0.293	1868.
800	15.77420	503.19	9.2	125.229	195.666	1.28894	0.188	0.299	1893.
850	14.91243	523.70	8.5	135.497	210.004	1.30623	0.189	0.285	1919.
900	14.14834	544.44	7.9	145.664	224.194	1.32245	0.188	0.283	1945.
950	13.46562	565.28	7.3	155.762	238.273	1.33768	0.189	0.281	1972.
1000	12.85142	586.16	6.8	165.815	252.270	1.35203	0.190	0.279	1999.
1100	11.78951	627.81	6.1	185.866	280.109	1.37857	0.192	0.278	2053.
1200	10.90168	669.20	5.5	205.943	307.860	1.40272	0.194	0.277	2105.
1300	10.14668	710.25	5.0	226.126	335.627	1.42494	0.197	0.278	2156.
1400	9.49555	750.97	4.6	246.470	363.479	1.44558	0.200	0.279	2205.
1500	8.92750	791.36	4.2	267.004	391.459	1.46488	0.202	0.281	2254.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

7000 PSIA ISORAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*131.650	55.69284	2408.36	172.8	-61.380	-38.105	0.60433	0.317	0.415	3819.
135	55.44789	2288.31	170.4	-60.095	-36.717	0.61475	0.311	0.414	3758.
140	55.06565	2131.61	167.1	-58.191	-34.651	0.62977	0.301	0.413	3682.
145	54.66481	1997.40	163.6	-56.303	-32.591	0.64423	0.291	0.412	3616.
150	54.24734	1881.59	159.9	-54.427	-30.532	0.65819	0.283	0.412	3559.
155	53.81550	1780.86	156.1	-52.560	-28.473	0.67169	0.276	0.412	3507.
160	53.37159	1692.47	152.1	-50.700	-26.413	0.68477	0.270	0.412	3459.
165	52.91781	1614.16	147.9	-48.847	-24.351	0.69746	0.265	0.413	3414.
170	52.45619	1544.08	143.6	-46.999	-22.288	0.70978	0.260	0.413	3370.
175	51.98849	1480.75	139.2	-45.156	-20.222	0.72176	0.256	0.413	3327.
180	51.51626	1422.96	134.9	-43.318	-18.156	0.73340	0.253	0.413	3284.
185	51.04075	1369.75	130.6	-41.486	-16.089	0.74472	0.250	0.413	3242.
190	50.56302	1320.39	126.4	-39.658	-14.022	0.75575	0.247	0.413	3200.
195	50.08333	1274.29	122.2	-37.837	-11.955	0.76649	0.245	0.413	3159.
200	49.60416	1230.99	118.2	-36.021	-9.889	0.77695	0.242	0.413	3118.
205	49.12429	1190.15	114.2	-34.212	-7.824	0.78714	0.240	0.413	3077.
210	48.64478	1151.51	110.4	-32.408	-5.761	0.79709	0.239	0.412	3037.
215	48.16600	1114.85	106.6	-30.612	-3.700	0.80679	0.237	0.412	2997.
220	47.68828	1080.01	103.1	-28.822	-1.640	0.81626	0.235	0.412	2959.
225	47.21191	1046.88	99.6	-27.040	0.416	0.82550	0.234	0.411	2919.
230	46.73712	1015.33	96.2	-25.265	2.470	0.83453	0.233	0.410	2881.
235	46.26414	985.30	93.0	-23.498	4.521	0.84335	0.231	0.410	2844.
240	45.79319	956.71	89.9	-21.739	6.568	0.85197	0.230	0.409	2808.
245	45.32446	929.49	86.9	-19.988	8.611	0.86040	0.229	0.408	2772.
250	44.85814	903.60	84.0	-18.246	10.651	0.86864	0.228	0.407	2738.
260	43.93346	855.54	78.6	-14.789	14.716	0.88458	0.225	0.406	2671.
270	43.02058	812.13	73.6	-11.371	18.760	0.89985	0.223	0.403	2608.
280	42.12083	772.98	69.0	-7.992	22.783	0.91448	0.221	0.401	2549.
290	41.23546	737.74	64.8	-4.654	26.731	0.92851	0.219	0.399	2494.
300	40.36563	706.05	60.8	-1.359	30.753	0.94197	0.217	0.396	2442.
320	38.67661	652.06	53.9	5.099	38.614	0.96734	0.214	0.390	2349.
340	37.06057	608.76	49.0	11.381	46.358	0.99082	0.210	0.384	2269.
360	35.52235	574.30	43.0	17.486	53.977	1.01259	0.208	0.378	2201.
380	34.06495	547.18	38.8	23.419	61.471	1.03285	0.205	0.372	2143.
400	32.68960	526.17	35.1	29.185	68.838	1.05175	0.203	0.365	2095.
420	31.39598	510.24	32.0	34.793	76.080	1.06942	0.201	0.359	2055.
440	30.18237	498.50	29.3	40.253	83.200	1.08598	0.199	0.353	2023.
460	29.04596	490.24	26.9	45.574	90.201	1.10154	0.198	0.347	1997.
480	27.98308	484.81	24.9	50.767	97.090	1.11620	0.196	0.342	1977.
500	26.98955	481.73	23.1	55.842	103.870	1.13004	0.195	0.336	1961.
520	26.06087	480.56	21.6	60.810	110.550	1.14314	0.194	0.332	1949.
540	25.19250	480.96	20.2	65.680	117.134	1.15557	0.193	0.327	1941.
560	24.37994	482.67	19.0	70.461	123.630	1.16738	0.193	0.323	1936.
580	23.61887	485.44	17.9	75.161	130.043	1.17863	0.192	0.319	1933.
600	22.90521	489.11	16.9	79.788	136.390	1.18937	0.191	0.315	1932.
650	21.30413	501.24	14.9	91.078	151.923	1.21426	0.190	0.307	1937.
700	19.92449	516.34	13.3	102.045	167.103	1.23676	0.189	0.300	1948.
750	18.72493	533.37	12.0	112.761	181.987	1.25730	0.189	0.295	1965.
800	17.67250	551.63	10.9	123.285	196.633	1.27621	0.189	0.291	1985.
850	16.74181	570.71	10.0	133.663	211.089	1.29374	0.189	0.287	2006.
900	15.91247	590.31	9.3	143.934	225.395	1.31009	0.189	0.285	2029.
950	15.16838	610.25	8.6	154.128	239.585	1.32544	0.190	0.283	2053.
1000	14.49664	630.38	8.1	164.271	253.688	1.33990	0.191	0.281	2077.
1100	13.33037	670.95	7.1	184.485	281.726	1.36663	0.193	0.280	2125.
1200	12.35095	711.61	6.4	204.705	309.657	1.39093	0.195	0.279	2173.
1300	11.51489	752.15	5.8	225.014	337.585	1.41329	0.197	0.280	2221.
1400	10.79186	792.50	5.3	245.468	365.581	1.43403	0.200	0.280	2268.
1500	10.15945	832.63	4.9	266.101	393.692	1.45343	0.203	0.282	2314.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

8000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*134.06C	55.93313	2493.90	169.5	-60.833	-34.347	0.60765	0.316	0.406	3855.
135	55.86928	2460.23	163.1	-60.482	-33.966	0.61048	0.314	0.406	3840.
140	55.51752	2296.72	166.1	-58.625	-31.941	0.62521	0.303	0.404	3767.
145	55.14658	2156.14	163.8	-56.784	-29.921	0.63938	0.294	0.404	3705.
150	54.75832	2034.57	161.2	-54.956	-27.902	0.65307	0.286	0.404	3652.
155	54.35693	1928.74	158.2	-53.136	-25.881	0.66632	0.278	0.404	3604.
160	53.93872	1835.95	154.9	-51.323	-23.858	0.67917	0.272	0.405	3559.
165	53.51193	1753.93	151.3	-49.515	-21.831	0.69165	0.267	0.406	3517.
170	53.07669	1680.78	147.5	-47.711	-19.800	0.70378	0.262	0.407	3477.
175	52.63499	1614.95	143.6	-45.911	-17.765	0.71557	0.259	0.407	3437.
180	52.18918	1555.15	139.6	-44.115	-15.728	0.72705	0.254	0.408	3398.
185	51.73796	1500.35	135.5	-42.323	-13.689	0.73822	0.251	0.408	3359.
190	51.28541	1449.72	131.5	-40.535	-11.649	0.74910	0.249	0.408	3320.
195	50.83149	1402.60	127.4	-38.753	-9.609	0.75970	0.246	0.408	3282.
200	50.37698	1358.47	123.5	-36.976	-7.569	0.77003	0.244	0.408	3243.
205	49.92253	1316.93	119.6	-35.205	-5.530	0.78010	0.242	0.408	3205.
210	49.46864	1277.67	115.9	-33.439	-3.492	0.78992	0.240	0.407	3167.
215	49.01574	1240.43	112.2	-31.680	-1.457	0.79950	0.239	0.407	3130.
220	48.56418	1205.04	108.6	-29.928	0.576	0.80885	0.237	0.406	3092.
225	48.11424	1171.34	105.2	-28.183	2.607	0.81797	0.236	0.406	3056.
230	47.66616	1139.21	101.9	-26.445	4.634	0.82689	0.234	0.405	3020.
235	47.22016	1108.55	98.6	-24.715	6.658	0.83559	0.233	0.404	2985.
240	46.77643	1079.29	95.5	-22.993	8.678	0.84409	0.232	0.404	2950.
245	46.33513	1051.37	92.5	-21.279	10.693	0.85241	0.231	0.403	2917.
250	45.89641	1024.71	89.6	-19.573	12.704	0.86053	0.229	0.402	2883.
260	45.02731	975.01	84.2	-16.189	16.712	0.87625	0.227	0.400	2819.
270	44.17020	929.81	79.1	-12.841	20.699	0.89130	0.225	0.398	2759.
280	43.32605	888.76	74.4	-9.531	24.662	0.90571	0.223	0.395	2701.
290	42.49577	851.54	70.1	-6.260	28.601	0.91953	0.221	0.393	2647.
300	41.68016	817.33	66.1	-3.029	32.514	0.93280	0.219	0.390	2595.
320	40.09572	759.76	59.0	3.310	40.257	0.95779	0.216	0.384	2504.
340	38.57730	712.40	52.9	9.485	47.887	0.99092	0.213	0.379	2425.
360	37.12793	673.92	47.7	15.498	55.399	1.00739	0.210	0.373	2356.
380	35.74922	642.84	43.2	21.354	62.794	1.02238	0.207	0.367	2296.
400	34.44158	617.94	39.3	27.059	70.072	1.04105	0.205	0.361	2246.
420	33.20437	598.23	36.0	32.621	77.237	1.05853	0.203	0.355	2203.
440	32.03608	582.88	33.1	38.049	84.292	1.07494	0.201	0.350	2163.
460	30.93450	571.17	30.5	43.351	91.240	1.09038	0.200	0.345	2138.
480	29.89689	562.54	28.3	48.537	98.088	1.10495	0.198	0.340	2114.
500	28.92011	556.47	26.4	53.614	104.839	1.11874	0.197	0.335	2095.
520	28.00079	552.55	24.6	58.592	111.499	1.13130	0.196	0.331	2079.
540	27.13547	550.44	23.1	63.479	118.073	1.14420	0.195	0.327	2067.
560	26.32065	549.84	21.7	68.282	124.566	1.15601	0.194	0.323	2053.
580	25.55294	550.52	20.5	73.009	130.984	1.16727	0.193	0.319	2052.
600	24.82904	552.27	19.4	77.666	137.331	1.17803	0.193	0.316	2047.
650	23.19099	560.33	17.1	89.042	152.922	1.20299	0.191	0.308	2045.
700	21.76422	572.21	15.3	100.102	168.169	1.22559	0.191	0.302	2050.
750	20.51257	586.67	13.8	110.912	183.133	1.24624	0.190	0.297	2061.
800	19.40660	602.89	12.6	121.529	197.866	1.26526	0.190	0.293	2076.
850	18.42257	620.31	11.5	131.997	212.411	1.28290	0.190	0.289	2093.
900	17.54129	638.57	10.7	142.354	226.808	1.29936	0.190	0.297	2112.
950	16.74725	657.41	9.9	152.630	241.088	1.31480	0.191	0.295	2132.
1000	16.02784	676.65	9.3	162.850	255.279	1.32936	0.191	0.293	2154.
1100	14.77333	715.85	8.2	183.206	283.483	1.35624	0.193	0.291	2197.
1200	13.71467	755.54	7.4	203.551	311.569	1.38068	0.195	0.291	2242.
1300	12.80777	795.39	6.7	223.972	339.638	1.40315	0.198	0.291	2286.
1400	12.02100	835.22	6.1	244.526	367.763	1.42399	0.201	0.292	2330.
1500	11.33105	874.96	5.7	265.250	395.990	1.44346	0.203	0.293	2374.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

9000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*136.437	56.17101	2582.17	165.2	-60.283	-30.613	0.61083	0.313	0.397	3899.
140	55.93789	2463.29	164.7	-58.993	-29.199	0.62106	0.305	0.396	3850.
145	55.59400	2316.06	163.6	-57.197	-27.218	0.63496	0.296	0.396	3792.
150	55.23215	2188.34	162.0	-55.413	-25.238	0.64838	0.287	0.396	3741.
155	54.85446	2076.98	159.9	-53.638	-23.255	0.66139	0.280	0.397	3696.
160	54.46318	1979.33	157.3	-51.868	-21.267	0.67401	0.273	0.398	3655.
165	54.06058	1893.11	154.3	-50.102	-19.273	0.68628	0.268	0.399	3616.
170	53.64885	1816.42	151.0	-48.339	-17.274	0.69822	0.263	0.401	3578.
175	53.22995	1747.64	147.5	-46.578	-15.269	0.70985	0.259	0.401	3542.
180	52.80564	1685.43	143.8	-44.820	-13.259	0.72117	0.256	0.402	3505.
185	52.37743	1628.67	140.0	-43.065	-11.246	0.73220	0.253	0.403	3469.
190	51.94662	1576.46	136.1	-41.313	-9.230	0.74295	0.250	0.403	3432.
195	51.51425	1528.07	132.3	-39.566	-7.213	0.75343	0.248	0.403	3396.
200	51.08120	1482.91	128.5	-37.822	-5.196	0.76365	0.246	0.404	3360.
205	50.64819	1440.53	124.7	-36.084	-3.179	0.77361	0.244	0.403	3324.
210	50.21579	1400.54	121.0	-34.351	-1.162	0.78332	0.242	0.403	3288.
215	49.78447	1362.68	117.4	-32.624	0.852	0.79280	0.240	0.403	3253.
220	49.35459	1326.71	113.8	-30.904	2.864	0.80206	0.239	0.402	3218.
225	48.92648	1292.46	110.4	-29.190	4.874	0.81109	0.237	0.402	3183.
230	48.50037	1259.78	107.1	-27.483	6.880	0.81991	0.236	0.401	3148.
235	48.07649	1228.56	103.9	-25.784	8.882	0.82852	0.235	0.400	3115.
240	47.65500	1198.72	100.7	-24.092	10.881	0.83693	0.234	0.399	3081.
245	47.23606	1170.18	97.7	-22.408	12.875	0.84516	0.232	0.398	3049.
250	46.81981	1142.88	94.8	-20.732	14.864	0.85320	0.231	0.397	3017.
260	45.99583	1091.77	89.3	-17.406	18.828	0.86874	0.229	0.395	2955.
270	45.18389	1045.03	84.2	-14.115	22.770	0.88362	0.227	0.393	2896.
280	44.38473	1002.32	79.4	-10.860	26.689	0.89787	0.225	0.391	2840.
290	43.59898	963.34	75.0	-7.643	30.583	0.91154	0.223	0.388	2787.
300	42.82720	927.82	70.9	-4.463	34.451	0.92465	0.221	0.385	2737.
320	41.32747	866.05	63.6	1.780	42.107	0.94936	0.218	0.380	2646.
340	39.88856	814.99	57.4	7.869	49.651	0.97223	0.215	0.374	2567.
360	38.51233	772.90	52.0	13.808	57.082	0.99347	0.212	0.369	2497.
380	37.19956	738.29	47.3	19.600	64.402	1.01326	0.209	0.363	2437.
400	35.95013	709.98	43.2	25.253	71.612	1.03175	0.207	0.358	2385.
420	34.76314	686.95	39.7	30.773	78.715	1.04908	0.205	0.353	2341.
440	33.63712	668.40	36.6	36.170	85.717	1.06536	0.203	0.348	2303.
460	32.57013	653.64	33.9	41.451	92.620	1.08071	0.201	0.343	2271.
480	31.55988	642.11	31.6	46.623	99.431	1.09520	0.200	0.339	2244.
500	30.60393	633.31	29.4	51.695	106.153	1.10892	0.199	0.334	2221.
520	29.69927	626.84	27.6	56.675	112.791	1.12194	0.197	0.330	2203.
540	28.84343	622.36	25.9	61.569	119.350	1.13432	0.196	0.326	2189.
560	28.03348	619.56	24.4	66.384	125.835	1.14611	0.196	0.322	2176.
580	27.26666	618.21	23.1	71.127	132.250	1.15737	0.195	0.319	2166.
600	26.54028	618.09	21.9	75.804	138.599	1.16813	0.194	0.316	2159.
650	24.88454	622.09	19.3	87.238	154.212	1.19313	0.193	0.309	2150.
700	23.42973	630.67	17.2	98.366	169.501	1.21579	0.192	0.303	2149.
750	22.14136	642.44	15.6	109.250	184.521	1.23652	0.191	0.298	2155.
800	20.99613	656.46	14.2	119.941	199.318	1.25562	0.191	0.294	2165.
850	19.97131	672.09	13.0	130.482	213.932	1.27334	0.191	0.291	2179.
900	19.04904	688.86	12.1	140.910	228.401	1.28988	0.191	0.288	2194.
950	18.21462	706.46	11.2	151.255	242.753	1.30540	0.191	0.286	2212.
1000	17.45591	724.67	10.5	161.541	257.016	1.32003	0.192	0.285	2230.
1100	16.12706	762.27	9.3	182.020	285.362	1.34705	0.194	0.283	2269.
1200	15.00026	800.81	8.3	202.475	313.581	1.37161	0.196	0.282	2310.
1300	14.03130	839.81	7.6	222.997	341.774	1.39417	0.199	0.282	2351.
1400	13.18807	879.01	6.9	243.641	370.014	1.41510	0.201	0.283	2392.
1500	12.44667	918.25	6.4	264.447	398.346	1.43465	0.204	0.284	2434.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

10000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB / CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORP DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*138.781	56.40543	2672.51	162.7	-59.733	-26.903	0.61388	0.309	0.389	3948.
140	56.33061	2631.52	162.8	-59.303	-26.429	0.61728	0.306	0.389	3933.
145	56.01141	2477.43	162.9	-57.549	-24.488	0.63091	0.296	0.388	3877.
150	55.67369	2343.27	162.3	-55.807	-22.546	0.64407	0.288	0.389	3828.
155	55.31945	2226.02	161.1	-54.074	-20.600	0.65683	0.281	0.390	3786.
160	54.95090	2123.08	159.2	-52.346	-18.647	0.66924	0.274	0.391	3747.
165	54.57031	2032.24	156.8	-50.620	-16.686	0.68131	0.269	0.393	3710.
170	54.17986	1951.57	154.1	-48.895	-14.716	0.69306	0.264	0.395	3675.
175	53.78158	1879.42	150.9	-47.171	-12.740	0.70452	0.260	0.396	3640.
180	53.37733	1814.40	147.6	-45.448	-10.756	0.71570	0.257	0.397	3606.
185	52.96869	1755.32	144.1	-43.727	-8.767	0.72660	0.254	0.398	3572.
190	52.55705	1701.22	140.4	-42.008	-6.774	0.73723	0.251	0.399	3538.
195	52.14356	1651.29	136.8	-40.292	-4.779	0.74759	0.249	0.399	3503.
200	51.72917	1604.88	133.1	-38.579	-2.781	0.75771	0.247	0.400	3469.
205	51.31469	1561.47	129.4	-36.870	-0.783	0.76758	0.245	0.400	3435.
210	50.90073	1520.64	125.8	-35.166	1.214	0.77720	0.243	0.399	3401.
215	50.48782	1482.06	122.2	-33.467	3.211	0.78660	0.242	0.399	3367.
220	50.07637	1445.46	118.7	-31.774	5.206	0.79577	0.240	0.399	3333.
225	49.66672	1410.63	115.3	-30.087	7.198	0.80472	0.239	0.398	3300.
230	49.25912	1377.41	112.0	-28.406	9.186	0.81347	0.238	0.397	3267.
235	48.85381	1345.67	108.8	-26.733	11.172	0.82201	0.236	0.397	3234.
240	48.45096	1315.31	105.6	-25.067	13.153	0.83035	0.235	0.396	3202.
245	48.05072	1286.22	102.6	-23.408	15.130	0.83850	0.234	0.395	3171.
250	47.65321	1258.36	99.7	-21.757	17.103	0.84647	0.233	0.394	3140.
260	46.86678	1206.04	94.1	-18.480	21.032	0.85188	0.231	0.392	3080.
270	46.09239	1157.97	89.0	-15.236	24.940	0.87663	0.229	0.390	3023.
280	45.33058	1113.81	84.1	-12.027	28.824	0.89076	0.227	0.387	2968.
290	44.58180	1073.30	79.7	-8.854	32.683	0.90430	0.225	0.385	2916.
300	43.84644	1036.16	75.5	-5.717	36.517	0.91730	0.223	0.382	2867.
320	42.41720	971.05	68.0	0.448	44.105	0.94178	0.220	0.377	2777.
340	41.04478	916.61	61.6	6.467	51.583	0.96446	0.217	0.371	2678.
360	39.73017	871.19	56.0	12.344	58.953	0.98552	0.214	0.366	2628.
380	38.47360	833.37	51.2	18.083	66.214	1.00515	0.211	0.360	2567.
400	37.27456	801.94	46.9	23.691	73.370	1.02350	0.209	0.355	2514.
420	36.13202	775.92	43.2	29.175	80.425	1.04072	0.207	0.350	2468.
440	35.04449	754.49	40.0	34.543	87.384	1.05690	0.205	0.346	2425.
460	34.01017	736.97	37.2	39.802	94.250	1.07216	0.203	0.341	2395.
480	33.02704	722.80	34.6	44.960	101.029	1.08659	0.202	0.337	2365.
500	32.09289	711.51	32.4	50.023	107.724	1.10026	0.200	0.333	2341.
520	31.20544	702.68	30.4	55.000	114.342	1.11323	0.199	0.329	2320.
540	30.36234	695.97	28.6	59.895	120.885	1.12558	0.198	0.325	2302.
560	29.56124	691.10	27.0	64.716	127.359	1.13735	0.197	0.322	2288.
580	28.79981	687.80	25.5	69.468	133.767	1.14860	0.196	0.319	2276.
600	28.07579	685.88	24.2	74.157	140.114	1.15935	0.195	0.316	2267.
650	26.41517	685.90	21.4	85.632	155.735	1.18437	0.194	0.309	2252.
700	24.94317	691.18	19.2	96.811	171.051	1.20707	0.193	0.304	2246.
750	23.63220	700.22	17.3	107.750	186.109	1.22785	0.192	0.299	2247.
800	22.45877	711.96	15.8	118.500	200.953	1.24701	0.192	0.295	2253.
850	21.40314	725.69	14.5	129.101	215.621	1.26480	0.192	0.292	2263.
900	20.44878	740.87	13.5	139.589	230.146	1.28140	0.192	0.289	2275.
950	19.58189	757.14	12.5	149.991	244.557	1.29699	0.192	0.287	2290.
1000	18.79093	774.21	11.7	160.334	258.881	1.31168	0.193	0.286	2306.
1100	17.39963	810.04	10.4	180.919	297.346	1.33881	0.195	0.284	2340.
1200	16.21425	847.27	9.3	201.472	315.680	1.36347	0.197	0.283	2377.
1300	15.19104	885.29	8.4	222.083	343.983	1.38612	0.199	0.283	2415.
1400	14.29780	923.74	7.7	242.810	372.325	1.40712	0.202	0.284	2454.
1500	13.51041	962.40	7.1	263.689	400.753	1.42674	0.204	0.285	2493.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

12000 PSIA 150BAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*143.377	56.86139	2857.34	159.5	-58.642	-19.562	0.61957	0.300	0.373	4058.
145	56.76976	2805.15	160.2	-58.100	-18.956	0.62376	0.297	0.373	4041.
150	56.47479	2657.50	161.6	-56.437	-17.099	0.63642	0.288	0.374	3996.
155	56.16220	2527.65	162.1	-54.782	-15.216	0.64871	0.281	0.376	3957.
160	55.83403	2413.19	161.8	-53.130	-13.331	0.66068	0.275	0.378	3921.
165	55.49245	2312.00	160.7	-51.479	-11.435	0.67235	0.270	0.381	3888.
170	55.13962	2222.22	159.0	-49.826	-9.525	0.68375	0.265	0.383	3856.
175	54.77763	2142.18	156.8	-48.170	-7.604	0.69489	0.262	0.386	3824.
180	54.40841	2070.41	154.1	-46.513	-5.671	0.70578	0.258	0.388	3793.
185	54.03368	2005.66	151.2	-44.853	-3.728	0.71642	0.256	0.389	3762.
190	53.65498	1946.81	148.0	-43.193	-1.778	0.72683	0.253	0.391	3731.
195	53.27362	1892.96	144.7	-41.533	0.179	0.73699	0.251	0.392	3700.
200	52.89070	1843.32	141.3	-39.873	2.141	0.74692	0.249	0.393	3669.
205	52.50716	1797.25	137.9	-38.216	4.105	0.75663	0.247	0.393	3637.
210	52.12375	1754.23	134.4	-36.561	6.071	0.76610	0.246	0.393	3606.
215	51.74109	1713.83	131.0	-34.909	8.038	0.77536	0.244	0.393	3574.
220	51.35968	1675.69	127.6	-33.262	10.004	0.78440	0.243	0.393	3543.
225	50.97994	1639.53	124.2	-31.620	11.969	0.79323	0.242	0.393	3512.
230	50.60218	1605.14	120.9	-29.983	13.931	0.80185	0.241	0.392	3481.
235	50.22665	1572.32	117.7	-28.352	15.890	0.81028	0.240	0.392	3451.
240	49.85355	1540.94	114.6	-26.727	17.846	0.81852	0.238	0.391	3421.
245	49.48306	1510.88	111.5	-25.109	19.798	0.82656	0.237	0.390	3391.
250	49.11529	1482.03	108.6	-23.498	21.745	0.83443	0.236	0.389	3362.
260	48.38829	1427.70	103.0	-20.298	25.625	0.84965	0.234	0.387	3305.
270	47.67314	1377.46	97.7	-17.129	29.483	0.86421	0.232	0.385	3251.
280	46.97019	1330.97	92.7	-13.991	33.318	0.87816	0.230	0.382	3198.
290	46.27968	1287.94	88.1	-10.887	37.129	0.89153	0.229	0.380	3149.
300	45.60177	1248.14	83.8	-7.815	40.914	0.90436	0.227	0.377	3101.
320	44.28410	1177.35	76.1	-1.772	48.407	0.92854	0.224	0.372	3013.
340	43.01750	1117.01	69.3	4.137	55.794	0.95094	0.220	0.367	2935.
360	41.80193	1065.69	63.4	9.917	63.077	0.97175	0.217	0.362	2865.
380	40.63649	1022.10	58.3	15.573	70.256	0.99116	0.215	0.356	2803.
400	39.52054	985.10	53.8	21.109	77.337	1.00932	0.212	0.352	2749.
420	38.45272	953.73	49.8	26.533	84.322	1.02637	0.210	0.347	2701.
440	37.43155	927.18	46.3	31.852	91.218	1.04240	0.208	0.343	2658.
460	36.45538	904.76	43.2	37.073	98.028	1.05754	0.206	0.338	2622.
480	35.52246	885.92	40.4	42.201	104.757	1.07186	0.205	0.335	2589.
500	34.63098	870.16	37.9	47.244	111.411	1.08544	0.203	0.331	2561.
520	33.77910	857.10	35.7	52.208	117.993	1.09835	0.202	0.327	2537.
540	32.96499	846.37	33.7	57.099	124.508	1.11065	0.201	0.324	2516.
560	32.18682	837.69	31.9	61.920	130.959	1.12238	0.200	0.321	2495.
580	31.44282	830.80	30.2	66.679	137.352	1.13359	0.199	0.318	2482.
600	30.73126	825.49	28.7	71.379	143.688	1.14433	0.198	0.315	2469.
650	29.08338	817.93	25.5	82.901	159.307	1.16934	0.196	0.309	2445.
700	27.60348	810.77	22.9	94.145	174.647	1.19208	0.195	0.304	2431.
750	26.26986	820.33	20.8	105.161	189.751	1.21202	0.194	0.300	2424.
800	25.06356	827.44	19.0	115.996	204.656	1.23216	0.193	0.296	2423.
850	23.96823	837.23	17.5	126.686	219.398	1.25004	0.193	0.293	2427.
900	22.96983	849.06	16.2	137.264	234.006	1.26674	0.193	0.291	2433.
950	22.05635	862.46	15.1	147.757	248.505	1.28242	0.194	0.289	2442.
1000	21.21754	877.08	14.1	158.189	262.920	1.29721	0.194	0.288	2453.
1100	19.73008	908.96	12.5	178.947	291.574	1.32452	0.196	0.286	2479.
1200	18.45120	943.22	11.2	199.664	320.097	1.34934	0.198	0.285	2509.
1300	17.33912	978.96	10.2	220.426	348.584	1.37214	0.200	0.285	2541.
1400	16.36241	1015.64	9.3	241.293	377.101	1.39327	0.203	0.285	2574.
1500	15.49701	1052.90	8.6	262.302	405.694	1.41300	0.205	0.286	2609.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

14000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB. - R	CP BTU / LB. - R	VELOCITY OF SOUND FT/SEC
*147.859	57.29824	3045.23	158.0	-57.570	-12.324	0.62471	0.291	0.359	4175.
150	57.18544	2978.44	159.3	-56.890	-11.555	0.62988	0.287	0.360	4157.
155	56.90903	2835.28	161.6	-55.307	-9.752	0.64170	0.280	0.362	4119.
160	56.61606	2708.35	162.8	-53.726	-7.936	0.65323	0.274	0.365	4085.
165	56.30853	2595.70	163.1	-52.144	-6.103	0.66451	0.270	0.368	4054.
170	55.98354	2495.56	162.5	-50.557	-4.253	0.67556	0.265	0.372	4024.
175	55.65812	2406.30	161.2	-48.965	-2.386	0.68638	0.262	0.375	3994.
180	55.31922	2326.45	159.4	-47.367	-0.503	0.69699	0.259	0.378	3965.
185	54.97365	2254.70	157.1	-45.764	1.395	0.70739	0.257	0.381	3936.
190	54.62301	2189.87	154.5	-44.157	3.304	0.71757	0.255	0.383	3907.
195	54.26875	2130.95	151.6	-42.547	5.224	0.72755	0.253	0.385	3878.
200	53.91208	2077.06	148.5	-40.935	7.152	0.73731	0.251	0.386	3848.
205	53.55407	2027.43	145.3	-39.322	9.087	0.74686	0.249	0.387	3819.
210	53.19558	1981.45	142.1	-37.710	11.025	0.75621	0.248	0.388	3789.
215	52.83735	1938.59	138.8	-36.099	12.967	0.76535	0.247	0.388	3760.
220	52.47997	1898.39	135.5	-34.490	14.910	0.77428	0.246	0.389	3730.
225	52.12393	1860.51	132.2	-32.885	16.853	0.78301	0.244	0.389	3701.
230	51.76962	1824.65	128.9	-31.283	18.795	0.79155	0.243	0.388	3672.
235	51.41733	1790.57	125.8	-29.686	20.735	0.79989	0.242	0.388	3643.
240	51.06732	1758.07	122.6	-28.094	22.672	0.80805	0.241	0.387	3615.
245	50.71979	1726.99	119.6	-26.508	24.606	0.81602	0.240	0.386	3587.
250	50.37486	1697.20	116.6	-24.928	26.536	0.82382	0.239	0.386	3559.
260	49.69329	1641.10	110.9	-21.788	30.382	0.83891	0.237	0.384	3505.
270	49.02321	1589.13	105.5	-18.675	34.209	0.85335	0.236	0.382	3452.
280	48.36496	1540.82	100.5	-15.591	38.012	0.86718	0.234	0.379	3402.
290	47.71868	1495.87	95.8	-12.537	41.792	0.88045	0.232	0.377	3354.
300	47.08440	1454.00	91.4	-9.514	45.546	0.89317	0.230	0.374	3308.
320	45.85174	1378.74	83.3	-3.562	52.979	0.91716	0.227	0.369	3222.
340	44.66635	1313.58	76.3	2.267	60.309	0.93938	0.224	0.354	3145.
360	43.52731	1257.27	70.2	7.976	67.536	0.96004	0.221	0.359	3075.
380	42.43347	1208.69	64.8	13.568	74.664	0.97931	0.218	0.354	3013.
400	41.38356	1166.80	60.0	19.050	81.696	0.99734	0.216	0.349	2958.
420	40.37617	1130.71	55.8	24.428	88.637	1.01428	0.214	0.345	2908.
440	39.40975	1099.62	52.0	29.708	95.491	1.03022	0.211	0.341	2865.
460	38.48296	1072.88	49.7	34.896	102.264	1.04527	0.210	0.337	2826.
480	37.59379	1049.89	45.7	39.999	108.960	1.05952	0.208	0.333	2792.
500	36.74098	1030.19	43.0	45.022	115.584	1.07304	0.206	0.329	2761.
520	35.92283	1013.36	40.6	49.972	122.140	1.08590	0.205	0.326	2735.
540	35.13778	999.05	38.4	54.853	128.634	1.09816	0.204	0.323	2711.
560	34.38431	986.96	36.4	59.669	135.067	1.10985	0.202	0.320	2690.
580	33.66094	976.83	34.6	64.427	141.445	1.12105	0.201	0.318	2672.
600	32.96624	968.44	33.0	69.130	147.771	1.13177	0.200	0.315	2656.
650	31.34608	953.85	29.4	80.672	163.378	1.15676	0.198	0.309	2626.
700	29.87675	946.56	26.5	91.951	178.725	1.17950	0.197	0.305	2605.
750	28.54048	944.82	24.1	103.015	193.851	1.20038	0.196	0.301	2592.
800	27.32158	947.33	22.1	113.904	208.793	1.21967	0.195	0.297	2585.
850	26.20631	953.13	20.4	124.654	223.581	1.23760	0.195	0.294	2583.
900	25.18267	961.50	18.9	135.295	238.243	1.25436	0.195	0.292	2585.
950	24.24024	971.90	17.6	145.854	252.804	1.27011	0.195	0.290	2589.
1000	23.36996	983.90	16.5	156.352	267.285	1.28496	0.195	0.289	2596.
1100	21.81547	1011.50	14.6	177.241	296.079	1.31241	0.197	0.287	2614.
1200	20.46780	1042.45	13.1	198.085	324.748	1.33735	0.199	0.286	2637.
1300	19.28786	1075.62	11.9	218.969	353.380	1.36027	0.201	0.286	2664.
1400	18.24557	1110.25	10.9	239.951	382.040	1.38151	0.204	0.287	2692.
1500	17.31759	1145.88	10.1	261.068	410.772	1.40133	0.206	0.288	2723.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

16000 PSIA 150BAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*152.236	57.71551	3234.17	157.5	-56.521	-5.185	0.62937	0.282	0.347	4294.
155	57.57812	3149.67	159.6	-55.683	-4.225	0.63562	0.278	0.348	4274.
160	57.31638	3009.71	162.4	-54.168	-2.475	0.64673	0.273	0.352	4241.
165	57.03920	2884.82	164.0	-52.650	-0.706	0.65762	0.268	0.356	4210.
170	56.74953	2773.38	164.6	-51.126	1.085	0.66831	0.265	0.350	4181.
175	56.44634	2673.85	164.3	-49.593	2.897	0.67882	0.262	0.355	4153.
180	56.13452	2584.80	163.4	-48.052	4.730	0.68914	0.259	0.359	4125.
185	55.81489	2504.90	161.8	-46.502	6.582	0.69929	0.257	0.372	4098.
190	55.48912	2432.95	159.8	-44.945	8.451	0.70926	0.255	0.375	4070.
195	55.15869	2367.87	157.4	-43.381	10.334	0.71904	0.254	0.378	4042.
200	54.82494	2308.69	154.7	-41.813	12.229	0.72864	0.252	0.380	4013.
205	54.48902	2254.57	151.8	-40.241	14.135	0.73805	0.251	0.382	3985.
210	54.15189	2204.79	149.8	-38.666	16.047	0.74727	0.250	0.383	3957.
215	53.81440	2158.73	145.7	-37.091	17.966	0.75630	0.249	0.384	3928.
220	53.47723	2115.84	142.5	-35.516	19.888	0.76513	0.248	0.385	3900.
225	53.14094	2075.71	139.4	-33.943	21.812	0.77378	0.247	0.385	3872.
230	52.80600	2037.95	136.2	-32.372	23.737	0.78224	0.246	0.385	3844.
235	52.47279	2002.25	133.1	-30.804	25.661	0.79052	0.245	0.385	3817.
240	52.14159	1968.37	130.0	-29.240	27.584	0.79862	0.244	0.384	3789.
245	51.81264	1936.10	126.9	-27.680	29.504	0.80654	0.243	0.384	3762.
250	51.48612	1905.26	123.9	-26.125	31.422	0.81428	0.242	0.383	3736.
260	50.84091	1847.34	118.2	-23.033	35.245	0.82928	0.241	0.381	3684.
270	50.20670	1793.76	112.7	-19.964	39.049	0.84363	0.239	0.379	3634.
280	49.58387	1743.92	107.6	-16.923	42.832	0.85739	0.237	0.377	3585.
290	48.97257	1697.42	102.8	-13.909	46.592	0.87059	0.235	0.375	3538.
300	48.37281	1653.94	98.2	-10.924	50.327	0.88325	0.234	0.372	3494.
320	47.20750	1575.15	90.0	-5.040	57.722	0.90712	0.230	0.367	3410.
340	46.08681	1506.12	82.8	0.727	65.016	0.92923	0.227	0.362	3334.
360	45.00927	1445.69	76.4	6.381	72.208	0.94978	0.224	0.357	3265.
380	43.97334	1392.85	70.7	11.925	79.303	0.96896	0.222	0.352	3203.
400	42.97748	1346.70	65.7	17.365	86.304	0.98692	0.219	0.348	3147.
420	42.02013	1306.42	61.3	22.706	93.216	1.00378	0.217	0.343	3097.
440	41.09976	1271.26	57.4	27.955	100.044	1.01967	0.215	0.339	3052.
460	40.21483	1240.60	53.8	33.117	106.793	1.03467	0.213	0.336	3012.
480	39.36383	1213.86	50.6	38.198	113.467	1.04887	0.211	0.332	2977.
500	38.54530	1190.57	47.8	43.204	120.071	1.06235	0.209	0.329	2945.
520	37.75781	1170.32	45.2	48.140	126.610	1.07517	0.207	0.325	2916.
540	36.99995	1152.74	42.9	53.010	133.088	1.08740	0.206	0.322	2891.
560	36.27040	1137.53	40.7	57.820	139.508	1.09907	0.205	0.320	2863.
580	35.56787	1124.43	38.8	62.574	145.875	1.11024	0.204	0.317	2848.
600	34.89112	1113.20	37.0	67.275	152.193	1.12095	0.203	0.315	2830.
650	33.30443	1092.10	33.1	78.825	167.798	1.14592	0.200	0.309	2794.
700	31.85463	1079.05	29.9	90.123	183.135	1.16867	0.199	0.305	2769.
750	30.52662	1072.22	27.3	101.216	198.274	1.18956	0.198	0.301	2751.
800	29.30703	1070.25	25.0	112.141	213.238	1.20888	0.197	0.298	2739.
850	28.18408	1072.12	23.1	122.932	228.057	1.22685	0.196	0.295	2733.
900	27.14739	1077.03	21.5	133.618	242.758	1.24365	0.196	0.293	2730.
950	26.18785	1084.39	20.0	144.224	257.362	1.25944	0.196	0.291	2730.
1000	25.29745	1093.71	18.9	154.771	271.892	1.27435	0.197	0.290	2733.
1100	23.69677	1116.84	16.7	175.761	300.793	1.30190	0.198	0.288	2745.
1200	22.29866	1144.28	15.0	196.705	329.576	1.32694	0.200	0.288	2762.
1300	21.06685	1174.65	13.6	217.687	358.327	1.34996	0.202	0.288	2783.
1400	19.97297	1207.05	12.5	238.763	387.106	1.37128	0.204	0.288	2807.
1500	18.99462	1240.85	11.5	259.970	415.955	1.39119	0.207	0.289	2834.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

18000 PSIA ISOBAR

TEMPERATURE	DENSITY	ISOTHERM	ISOCORE	INTERNAL	ENTHALPY	ENTROPY	CV	CP	VELOCITY
DEG R	LB/ CU FT	DERIVATIVE CU FT-PSIA/LB	DERIVATIVE PSIA/R	ENERGY BTU/LB	BTU/LB	BTU/LB-R	BTU / LB - R		OF SOUND FT/SEC
*156.515	50.11387	3422.85	157.7	-55.495	1.862	0.63360	0.274	0.336	4413.
160	57.94916	3317.74	160.6	-54.482	3.038	0.64103	0.270	0.339	4390.
165	57.69936	3180.15	163.6	-53.024	4.744	0.65153	0.266	0.344	4360.
170	57.43528	3056.77	165.4	-51.558	6.476	0.66187	0.263	0.349	4331.
175	57.15974	2946.19	166.2	-50.082	8.233	0.67205	0.261	0.354	4303.
180	56.87160	2847.03	166.2	-48.594	10.015	0.68210	0.259	0.359	4276.
185	56.57560	2758.02	165.4	-47.095	11.821	0.69199	0.257	0.363	4249.
190	56.27243	2677.95	164.0	-45.585	13.648	0.70174	0.256	0.367	4222.
195	55.96361	2605.71	162.2	-44.066	15.494	0.71133	0.255	0.371	4194.
200	55.65051	2540.28	159.9	-42.539	17.357	0.72076	0.253	0.374	4167.
205	55.33437	2480.74	157.4	-41.005	19.233	0.73002	0.253	0.376	4139.
210	55.01625	2426.30	154.7	-39.466	21.120	0.73912	0.252	0.378	4111.
215	54.69705	2376.25	151.8	-37.924	23.015	0.74804	0.251	0.380	4084.
220	54.37756	2329.99	148.8	-36.391	24.917	0.75678	0.250	0.381	4056.
225	54.05842	2286.98	145.8	-34.836	26.823	0.76535	0.249	0.382	4029.
230	53.74016	2246.79	142.7	-33.292	28.733	0.77374	0.248	0.382	4002.
235	53.42323	2209.03	139.7	-31.750	30.643	0.78196	0.247	0.382	3975.
240	53.10797	2173.40	136.6	-30.209	32.554	0.79000	0.247	0.382	3949.
245	52.79467	2139.64	133.6	-28.673	34.463	0.79788	0.246	0.382	3923.
250	52.48357	2107.51	130.6	-27.139	36.370	0.80558	0.245	0.381	3897.
255	52.17467	2077.49	127.4	-25.607	38.274	0.81311	0.244	0.380	3871.
260	51.86857	2047.49	124.9	-24.087	40.176	0.82051	0.242	0.378	3847.
270	51.26393	1992.22	119.4	-21.056	43.965	0.83481	0.240	0.376	3796.
280	50.67015	1940.92	114.2	-18.049	47.734	0.84852	0.240	0.376	3751.
290	50.08744	1893.05	109.3	-15.067	51.481	0.86167	0.239	0.374	3706.
300	49.51583	1848.22	104.6	-12.112	55.205	0.87429	0.237	0.371	3662.
320	48.40549	1766.62	96.2	-6.283	62.578	0.89808	0.234	0.366	3581.
340	47.33775	1694.48	88.7	-0.564	69.849	0.92013	0.231	0.361	3505.
360	46.31083	1630.67	82.1	5.047	77.021	0.94063	0.228	0.356	3438.
380	45.32792	1574.27	76.3	10.553	84.096	0.95975	0.225	0.351	3377.
400	44.37225	1524.46	71.1	15.959	91.079	0.97766	0.222	0.347	3321.
420	43.45713	1480.49	66.5	21.272	97.973	0.99448	0.220	0.343	3270.
440	42.57598	1441.71	62.3	26.495	104.734	1.01033	0.217	0.339	3225.
460	41.72725	1407.50	58.6	31.636	111.517	1.02529	0.215	0.335	3184.
480	40.90950	1377.34	55.3	36.699	118.177	1.03946	0.213	0.331	3147.
500	40.12133	1350.76	52.3	41.690	124.769	1.05292	0.212	0.328	3114.
520	39.36140	1327.35	49.5	46.614	131.296	1.06572	0.210	0.325	3084.
540	38.62945	1306.75	47.0	51.475	137.764	1.07792	0.209	0.322	3053.
560	37.92125	1288.65	44.8	56.278	144.176	1.08958	0.207	0.319	3034.
580	37.23866	1272.79	42.7	61.027	150.536	1.10074	0.206	0.317	3012.
600	36.57957	1258.92	40.8	65.725	156.848	1.11144	0.205	0.314	2993.
650	35.02793	1231.73	36.6	77.275	172.434	1.13640	0.202	0.309	2953.
700	33.60178	1213.24	33.2	88.584	187.781	1.15915	0.201	0.305	2923.
750	32.28791	1201.57	30.3	99.694	202.928	1.18005	0.199	0.301	2901.
800	31.07464	1195.29	27.9	110.643	217.907	1.19938	0.198	0.298	2885.
850	29.95167	1193.32	25.8	121.462	232.749	1.21738	0.198	0.296	2875.
900	28.90939	1194.82	24.0	132.180	247.477	1.23422	0.198	0.294	2865.
950	27.94125	1199.14	22.4	142.820	262.114	1.25005	0.198	0.292	2865.
1000	27.03860	1205.76	21.0	153.404	276.681	1.26499	0.198	0.291	2865.
1100	25.40675	1224.34	18.7	174.471	305.666	1.29262	0.199	0.289	2871.
1200	23.97197	1249.14	16.8	195.495	334.542	1.31774	0.201	0.289	2883.
1300	22.70046	1275.58	15.3	216.556	363.391	1.34083	0.203	0.289	2897.
1400	21.56590	1305.60	14.0	237.710	392.270	1.36223	0.205	0.289	2919.
1500	20.54689	1337.46	12.9	258.993	421.218	1.38221	0.208	0.290	2942.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

20000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*160.702	58.49454	3610.45	158.3	-54.490	8.825	0.63745	0.267	0.327	4529.
165	58.30028	3482.01	162.0	-53.286	10.240	0.64614	0.264	0.332	4503.
170	58.06051	3346.30	165.1	-51.875	11.913	0.65613	0.261	0.337	4474.
175	57.80755	3224.11	167.0	-50.453	13.615	0.66599	0.259	0.343	4446.
180	57.54315	3114.18	167.9	-49.016	15.346	0.67575	0.258	0.349	4419.
185	57.26900	3015.30	167.9	-47.565	17.104	0.68538	0.257	0.354	4392.
190	56.98673	2926.27	167.3	-46.101	18.889	0.69490	0.256	0.359	4365.
195	56.69787	2845.99	166.0	-44.624	20.697	0.70429	0.255	0.364	4337.
200	56.40382	2773.42	164.3	-43.136	22.525	0.71355	0.254	0.367	4310.
205	56.10586	2707.60	162.2	-41.639	24.371	0.72267	0.254	0.371	4283.
210	55.80510	2647.68	159.8	-40.135	26.231	0.73163	0.253	0.373	4256.
215	55.50253	2592.86	157.2	-38.624	28.104	0.74044	0.252	0.375	4229.
220	55.19900	2542.49	154.5	-37.110	29.985	0.74910	0.252	0.377	4202.
225	54.89521	2495.95	151.6	-35.592	31.874	0.75758	0.251	0.378	4175.
230	54.59179	2452.74	148.7	-34.073	33.768	0.76591	0.250	0.379	4148.
235	54.28923	2412.41	145.7	-32.554	35.665	0.77407	0.250	0.330	4122.
240	53.98795	2374.58	142.7	-31.036	37.564	0.78207	0.249	0.330	4096.
245	53.68829	2339.94	139.8	-29.519	39.464	0.78990	0.248	0.330	4071.
250	53.39051	2305.22	136.8	-28.005	41.362	0.79757	0.248	0.330	4046.
260	52.80143	2242.63	131.1	-24.988	45.153	0.81244	0.246	0.319	3997.
270	52.22191	2185.39	125.5	-21.989	48.931	0.82670	0.245	0.317	3949.
280	51.65264	2132.52	120.3	-19.011	52.691	0.84037	0.243	0.315	3903.
290	51.09394	2083.31	115.3	-16.055	56.430	0.85349	0.242	0.313	3859.
300	50.54590	2037.25	110.6	-13.124	60.147	0.86609	0.240	0.310	3817.
320	49.48147	1953.26	101.9	-7.340	67.508	0.88985	0.237	0.366	3738.
340	48.45800	1878.61	94.3	-1.660	74.769	0.91186	0.234	0.361	3664.
360	47.47357	1812.06	87.5	3.916	81.930	0.93233	0.231	0.356	3598.
380	46.52618	1752.70	81.5	9.392	88.994	0.95143	0.228	0.351	3537.
400	45.61391	1699.79	76.1	14.773	95.966	0.96931	0.225	0.346	3481.
420	44.73496	1652.64	71.3	20.062	102.851	0.98610	0.223	0.342	3431.
440	43.88766	1610.65	67.0	25.265	109.653	1.00192	0.220	0.338	3385.
460	43.07048	1573.27	63.1	30.389	116.377	1.01687	0.218	0.334	3344.
480	42.28196	1540.00	59.6	35.437	123.029	1.03103	0.216	0.331	3306.
500	41.52076	1510.40	56.5	40.415	129.614	1.04447	0.214	0.328	3272.
520	40.78561	1484.07	53.6	45.329	136.135	1.05725	0.212	0.325	3241.
540	40.07531	1460.66	51.0	50.181	142.597	1.06945	0.211	0.322	3213.
560	39.38974	1439.87	48.6	54.977	149.004	1.08110	0.209	0.319	3188.
580	38.72484	1421.42	46.4	59.721	155.359	1.09225	0.208	0.317	3165.
600	38.08260	1405.08	44.4	64.416	161.667	1.10294	0.207	0.314	3145.
650	36.56565	1372.15	40.0	75.964	177.249	1.12789	0.204	0.309	3102.
700	35.16475	1348.51	36.3	87.277	192.597	1.15064	0.202	0.305	3069.
750	33.86808	1332.22	33.3	98.397	207.750	1.17155	0.201	0.301	3043.
800	32.66525	1321.79	30.6	109.362	222.741	1.19090	0.200	0.298	3024.
850	31.54708	1316.10	28.4	120.201	237.599	1.20892	0.199	0.296	3011.
900	30.50545	1314.27	26.4	130.942	252.349	1.22578	0.199	0.294	3001.
950	29.53317	1315.60	24.7	141.608	267.012	1.24164	0.199	0.293	2995.
1000	28.62381	1319.53	23.2	152.220	281.608	1.25661	0.199	0.291	2992.
1100	26.97165	1333.53	20.7	173.347	310.660	1.28430	0.200	0.290	2992.
1200	25.51027	1353.62	18.6	194.433	339.613	1.30949	0.202	0.289	2999.
1300	24.20871	1378.04	17.0	215.559	368.544	1.33265	0.204	0.289	3012.
1400	23.04206	1405.58	15.5	236.777	397.508	1.35412	0.206	0.290	3028.
1500	21.99016	1435.39	14.4	258.123	426.543	1.37415	0.208	0.291	3047.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

25000 PSIA ISODAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*170.811	59.37793	4071.94	160.2	-52.049	25.917	0.64581	0.254	0.310	4803.
175	59.20834	3945.33	164.1	-50.959	27.230	0.65340	0.254	0.317	4778.
180	58.99416	3806.81	167.6	-49.641	28.832	0.66243	0.253	0.324	4749.
185	58.76857	3681.07	169.9	-48.303	30.471	0.67141	0.254	0.331	4721.
190	58.53303	3567.09	171.2	-46.946	32.146	0.68034	0.254	0.338	4693.
195	58.28896	3463.85	171.7	-45.569	33.853	0.68921	0.254	0.345	4665.
200	58.03770	3370.36	171.5	-44.175	35.591	0.69801	0.254	0.350	4637.
205	57.78053	3285.64	170.7	-42.765	37.356	0.70672	0.255	0.355	4610.
210	57.51364	3208.78	169.4	-41.341	39.145	0.71534	0.255	0.360	4582.
215	57.25308	3138.91	167.7	-39.905	40.954	0.72386	0.255	0.364	4555.
220	56.98483	3075.23	165.6	-38.459	42.781	0.73226	0.255	0.367	4528.
225	56.71474	3017.00	163.4	-37.005	44.622	0.74053	0.255	0.370	4501.
230	56.44354	2963.57	160.9	-35.544	46.475	0.74868	0.255	0.372	4475.
235	56.17189	2914.34	158.4	-34.078	48.338	0.75669	0.255	0.373	4449.
240	55.90035	2868.80	155.7	-32.610	50.207	0.76456	0.254	0.374	4424.
245	55.62937	2826.49	152.9	-31.139	52.081	0.77229	0.254	0.375	4399.
250	55.35934	2786.99	150.2	-29.667	53.959	0.77988	0.253	0.376	4375.
260	54.82342	2715.13	144.6	-26.725	57.718	0.79462	0.252	0.376	4328.
270	54.29452	2650.95	139.2	-23.792	61.474	0.80880	0.251	0.375	4282.
280	53.77388	2592.80	133.8	-20.871	65.220	0.82242	0.250	0.374	4239.
290	53.26225	2539.46	128.7	-17.967	68.951	0.83551	0.249	0.372	4197.
300	52.76002	2490.05	123.9	-15.083	72.663	0.84809	0.247	0.370	4157.
320	51.78412	2400.59	114.9	-9.380	80.020	0.87184	0.244	0.366	4081.
340	50.84566	2321.03	106.8	-3.769	87.281	0.89385	0.241	0.361	4012.
360	49.94296	2249.49	99.6	1.748	94.443	0.91432	0.238	0.356	3948.
380	49.07394	2184.79	93.2	7.172	101.509	0.93342	0.235	0.351	3889.
400	48.23652	2126.15	87.4	12.507	108.481	0.95130	0.232	0.346	3835.
420	47.42873	2072.95	82.3	17.756	115.365	0.96810	0.229	0.342	3786.
440	46.64879	2024.69	77.6	22.924	122.165	0.98392	0.227	0.338	3740.
460	45.89507	1980.93	73.4	28.017	128.898	0.99886	0.224	0.334	3699.
480	45.16610	1941.24	69.6	33.039	135.537	1.01301	0.222	0.331	3650.
500	44.46057	1905.27	66.1	37.994	142.120	1.02644	0.220	0.327	3625.
520	43.77726	1872.68	63.0	42.888	148.639	1.03923	0.218	0.324	3593.
540	43.11508	1843.15	60.1	47.724	155.099	1.05142	0.216	0.322	3564.
560	42.47302	1816.41	57.4	52.507	161.505	1.06307	0.215	0.319	3537.
580	41.85014	1792.20	55.0	57.240	167.860	1.07422	0.213	0.317	3512.
600	41.24559	1770.30	52.7	61.926	174.168	1.08491	0.212	0.314	3489.
650	39.80922	1724.34	47.8	73.462	189.753	1.10986	0.209	0.309	3441.
700	38.47126	1688.89	43.6	84.776	205.111	1.13263	0.206	0.305	3401.
750	37.22213	1661.89	40.1	95.907	220.281	1.15356	0.205	0.302	3370.
800	36.05352	1641.76	37.1	106.891	235.296	1.17295	0.203	0.299	3345.
850	34.95816	1627.29	34.5	117.757	250.186	1.19100	0.202	0.297	3325.
900	33.92962	1617.49	32.3	128.531	264.975	1.20791	0.202	0.295	3309.
950	32.96221	1611.60	30.3	139.236	279.684	1.22381	0.202	0.294	3297.
1000	32.05083	1608.99	28.5	149.891	294.333	1.23884	0.202	0.292	3298.
1100	30.37835	1611.66	25.5	171.116	323.509	1.26665	0.202	0.291	3278.
1200	28.88079	1622.41	23.0	192.310	352.605	1.29197	0.204	0.291	3275.
1300	27.53253	1639.08	21.0	213.549	381.694	1.31525	0.206	0.291	3279.
1400	26.31244	1660.17	19.3	234.884	410.826	1.33684	0.208	0.292	3286.
1500	25.20307	1684.59	17.8	256.348	440.034	1.35699	0.210	0.293	3298.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

30000 PSIA ISOBAR

TEMPERATURE	DENSITY	ISOTHERM	ISOCHORE	INTERNAL	ENTHALPY	ENTROPY	CV	CP	VELOCITY
DEG R	LB/ CU FT	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB - R		OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
*180.465	60.18016	4520.71	161.9	-49.671	42.641	0.65285	0.247	0.300	5049.
185	60.01297	4381.75	166.2	-48.550	44.020	0.66039	0.248	0.308	5021.
190	59.81789	4240.96	169.7	-47.290	45.581	0.66872	0.250	0.316	4991.
195	59.61306	4112.36	172.2	-46.007	47.183	0.67705	0.251	0.324	4961.
200	59.39960	3995.10	173.7	-44.701	48.825	0.68536	0.253	0.332	4931.
205	59.17868	3889.28	174.4	-43.373	50.501	0.69364	0.254	0.339	4902.
210	58.95143	3791.03	174.4	-42.026	52.211	0.70187	0.255	0.345	4873.
215	58.71890	3702.49	173.9	-40.661	53.949	0.71005	0.256	0.350	4845.
220	58.48208	3621.84	172.9	-39.280	55.712	0.71816	0.257	0.355	4817.
225	58.24137	3548.27	171.5	-37.886	57.498	0.72619	0.257	0.359	4790.
230	57.99909	3481.06	169.7	-36.481	59.303	0.73412	0.258	0.363	4763.
235	57.75447	3419.53	167.8	-35.066	61.123	0.74195	0.258	0.366	4736.
240	57.50867	3363.03	165.6	-33.643	62.957	0.74967	0.258	0.368	4711.
245	57.26225	3311.01	163.3	-32.215	64.801	0.75728	0.258	0.370	4686.
250	57.01570	3262.96	160.8	-30.782	66.654	0.76476	0.258	0.371	4661.
260	56.52389	3176.93	155.8	-27.908	70.375	0.77936	0.258	0.373	4614.
270	56.03592	3101.89	150.6	-25.031	74.108	0.79345	0.257	0.373	4569.
280	55.55367	3035.42	145.4	-22.158	77.841	0.80702	0.256	0.373	4526.
290	55.07840	2975.72	140.3	-19.296	81.567	0.82010	0.255	0.372	4486.
300	54.61090	2921.39	135.4	-16.446	85.280	0.83268	0.254	0.370	4447.
320	53.70080	2824.98	126.2	-10.800	92.650	0.85647	0.251	0.366	4374.
340	52.82449	2740.64	117.8	-5.234	99.932	0.87854	0.248	0.362	4308.
360	51.98113	2665.21	110.3	0.246	107.118	0.89908	0.244	0.357	4247.
380	51.16904	2596.86	103.5	5.638	114.207	0.91825	0.241	0.352	4191.
400	50.38628	2534.48	97.4	10.946	121.202	0.93619	0.239	0.347	4139.
420	49.63090	2477.31	91.9	16.172	128.106	0.95303	0.235	0.343	4091.
440	48.90107	2424.82	87.0	21.320	134.925	0.96889	0.233	0.339	4046.
460	48.19515	2376.59	82.5	26.395	141.664	0.98387	0.230	0.335	4005.
480	47.51162	2332.27	78.5	31.402	148.328	0.99805	0.228	0.331	3968.
500	46.84915	2291.54	74.7	36.343	154.923	1.01151	0.225	0.328	3932.
520	46.20655	2254.12	71.3	41.225	161.454	1.02432	0.223	0.325	3900.
540	45.58273	2219.75	68.2	46.051	167.925	1.03653	0.221	0.322	3870.
560	44.97672	2188.19	65.4	50.825	174.341	1.04820	0.219	0.319	3842.
580	44.38764	2159.23	62.7	55.550	180.705	1.05937	0.218	0.317	3817.
600	43.81469	2132.65	60.3	60.230	187.022	1.07007	0.216	0.315	3793.
650	42.44819	2075.46	54.9	71.754	202.628	1.09506	0.213	0.310	3741.
700	41.16800	2029.56	50.3	83.063	218.006	1.11786	0.210	0.306	3698.
750	39.96578	1992.93	46.5	94.195	233.198	1.13882	0.208	0.302	3663.
800	38.83442	1963.96	43.1	105.184	248.237	1.15823	0.206	0.299	3633.
850	37.76779	1941.38	40.2	116.060	263.153	1.17632	0.205	0.297	3609.
900	36.76052	1924.17	37.7	126.849	277.972	1.19326	0.205	0.296	3589.
950	35.80796	1911.47	35.4	137.572	292.716	1.20920	0.204	0.294	3573.
1000	34.90556	1902.63	33.4	148.248	307.402	1.22427	0.204	0.293	3560.
1100	33.23724	1894.34	30.0	169.524	336.667	1.25216	0.205	0.292	3541.
1200	31.72931	1895.86	27.2	190.779	365.865	1.27757	0.206	0.292	3531.
1300	30.36010	1904.75	24.9	212.087	395.069	1.30094	0.207	0.292	3527.
1400	29.11154	1919.24	22.9	233.495	424.325	1.32262	0.209	0.293	3528.
1500	27.96842	1938.06	21.2	255.035	453.665	1.34287	0.211	0.294	3533.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

35000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*189.725	60.91802	4956.66	163.0	-47.317	59.076	0.65903	0.243	0.294	5268.
190	60.90896	4947.78	163.3	-47.252	59.157	0.65946	0.243	0.294	5267.
195	60.73893	4793.12	167.8	-46.054	60.653	0.66723	0.246	0.304	5234.
200	60.55913	4650.89	171.3	-44.829	62.194	0.67504	0.249	0.313	5202.
205	60.37099	4520.35	173.7	-43.579	63.778	0.68286	0.251	0.321	5171.
210	60.17514	4400.72	175.3	-42.305	65.402	0.69068	0.253	0.328	5140.
215	59.97286	4291.21	176.1	-41.008	67.062	0.69849	0.255	0.335	5110.
220	59.76497	4191.04	176.3	-39.691	68.754	0.70528	0.257	0.342	5081.
225	59.55238	4099.42	176.0	-38.356	70.476	0.71402	0.258	0.347	5052.
230	59.33589	4015.62	175.2	-37.005	72.224	0.72170	0.259	0.352	5024.
235	59.11628	3938.91	174.1	-35.641	73.995	0.72932	0.260	0.356	4996.
240	58.89423	3868.61	172.6	-34.264	75.785	0.73685	0.261	0.360	4969.
245	58.67039	3804.09	170.8	-32.877	77.592	0.74430	0.262	0.363	4943.
250	58.44531	3744.75	168.9	-31.482	79.412	0.75166	0.262	0.365	4918.
260	57.99138	3639.53	164.6	-28.675	83.084	0.76606	0.262	0.369	4870.
270	57.54175	3549.18	159.9	-25.853	86.783	0.78002	0.262	0.371	4824.
280	57.09288	3470.64	155.1	-23.025	90.496	0.79352	0.261	0.372	4781.
290	56.64857	3401.46	150.2	-20.199	94.213	0.80656	0.260	0.371	4741.
300	56.21006	3339.73	145.4	-17.380	97.924	0.81915	0.259	0.371	4702.
320	55.35342	3232.99	136.1	-11.781	105.307	0.84297	0.257	0.367	4631.
340	54.52626	3142.16	127.6	-6.249	112.616	0.86513	0.254	0.363	4567.
360	53.72903	3062.36	119.8	-0.794	119.835	0.88576	0.250	0.359	4508.
380	52.96030	2990.69	112.8	4.580	126.958	0.90502	0.247	0.354	4454.
400	52.22002	2925.42	106.4	9.872	133.986	0.92304	0.244	0.349	4404.
420	51.50496	2865.46	100.7	15.085	140.923	0.93997	0.241	0.345	4358.
440	50.81388	2810.09	95.5	20.223	147.771	0.95590	0.238	0.340	4315.
460	50.14515	2758.82	90.8	25.288	154.538	0.97094	0.235	0.336	4276.
480	49.49728	2711.27	86.5	30.286	161.228	0.98517	0.233	0.333	4239.
500	48.86892	2667.14	82.5	35.220	167.846	0.99868	0.230	0.329	4204.
520	48.25888	2626.17	78.9	40.096	174.397	1.01153	0.228	0.326	4172.
540	47.66607	2589.15	75.6	44.915	180.888	1.02370	0.226	0.323	4142.
560	47.08954	2552.86	72.6	49.684	187.321	1.03548	0.224	0.320	4115.
580	46.52841	2520.12	69.8	54.404	193.701	1.04667	0.222	0.318	4089.
600	45.98191	2489.75	67.2	59.080	200.033	1.05740	0.220	0.315	4065.
650	44.67516	2423.19	61.4	70.596	215.671	1.08244	0.217	0.310	4011.
700	43.44612	2368.24	56.5	81.899	231.078	1.10528	0.214	0.306	3966.
750	42.28712	2323.06	52.3	93.029	246.296	1.12628	0.211	0.303	3928.
800	41.19177	2286.09	48.7	104.018	261.361	1.14573	0.209	0.300	3896.
850	40.15465	2256.07	45.6	114.896	276.304	1.16384	0.208	0.298	3869.
900	39.17106	2231.95	42.8	125.690	291.150	1.18082	0.207	0.296	3845.
950	38.23688	2212.88	40.3	136.420	305.923	1.19679	0.207	0.295	3826.
1000	37.34847	2198.13	38.1	147.106	320.641	1.21189	0.206	0.294	3810.
1100	35.69618	2179.35	34.3	168.407	349.975	1.23985	0.206	0.293	3785.
1200	34.19164	2171.90	31.2	189.696	379.253	1.26532	0.207	0.293	3768.
1300	32.81613	2173.10	28.6	211.043	408.545	1.29877	0.209	0.293	3758.
1400	31.55394	2181.01	26.4	232.496	437.899	1.31052	0.211	0.294	3754.
1500	30.39173	2194.16	24.5	254.086	467.343	1.33084	0.213	0.295	3754.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

40000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHOPE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*198.638	61.60412	5380.78	163.3	-44.959	75.279	0.66465	0.242	0.290	5465.
200	61.56244	5336.52	164.7	-44.643	75.677	0.66664	0.243	0.293	5456.
205	61.40370	5181.85	169.0	-43.465	77.166	0.67400	0.247	0.302	5422.
210	61.23664	5039.05	172.3	-42.259	78.700	0.68139	0.250	0.311	5389.
215	61.06215	4907.45	174.6	-41.027	80.278	0.68891	0.253	0.319	5357.
220	60.98108	4786.33	176.2	-39.772	81.894	0.69625	0.256	0.327	5326.
225	60.69425	4674.97	177.1	-38.494	83.546	0.70367	0.258	0.334	5295.
230	60.50244	4572.67	177.5	-37.197	85.230	0.71107	0.260	0.340	5265.
235	60.30642	4478.71	177.3	-35.882	86.944	0.71844	0.261	0.345	5236.
240	60.10686	4392.42	176.7	-34.551	88.682	0.72576	0.263	0.350	5208.
245	59.90443	4313.14	175.7	-33.206	90.443	0.73303	0.264	0.354	5181.
250	59.69970	4240.25	174.4	-31.850	92.223	0.74022	0.265	0.358	5154.
260	59.28551	4111.31	171.2	-29.110	95.831	0.75437	0.266	0.363	5104.
270	58.86799	4001.38	167.3	-26.343	99.483	0.76815	0.266	0.367	5057.
280	58.45008	3906.85	163.0	-23.561	103.165	0.78154	0.266	0.369	5013.
290	58.03404	3824.76	158.5	-20.772	106.863	0.79452	0.265	0.370	4972.
300	57.62155	3752.66	154.0	-17.983	110.565	0.80707	0.264	0.370	4933.
320	56.81168	3631.07	144.9	-12.428	117.953	0.83091	0.262	0.368	4862.
340	56.02615	3530.82	136.4	-6.924	125.284	0.85313	0.259	0.365	4799.
360	55.26704	3444.96	128.5	-1.489	132.536	0.87386	0.256	0.360	4742.
380	54.53444	3369.72	121.2	3.872	139.697	0.89322	0.253	0.356	4639.
400	53.82743	3300.97	114.7	9.155	146.765	0.91135	0.249	0.351	4641.
420	53.14464	3238.57	108.7	14.362	153.739	0.92836	0.246	0.346	4597.
440	52.48453	3180.99	103.3	19.495	160.625	0.94438	0.243	0.342	4556.
460	51.84559	3127.52	93.3	24.556	167.426	0.95949	0.240	0.338	4517.
480	51.22639	3077.71	93.8	29.551	174.147	0.97380	0.237	0.334	4481.
500	50.62562	3031.19	89.7	34.482	180.795	0.98737	0.235	0.331	4448.
520	50.04208	2987.69	85.9	39.355	187.373	1.00027	0.232	0.327	4417.
540	49.47470	2947.00	82.5	44.172	193.888	1.01256	0.230	0.324	4388.
560	48.92253	2908.93	79.2	48.938	200.344	1.02430	0.228	0.321	4360.
580	48.38470	2873.32	76.3	53.656	206.745	1.03553	0.226	0.319	4334.
600	47.86044	2840.00	73.5	58.330	213.096	1.04630	0.224	0.316	4310.
650	46.60475	2765.87	67.4	69.841	228.777	1.07140	0.220	0.311	4256.
700	45.42050	2703.34	62.2	81.140	244.219	1.09429	0.217	0.307	4210.
750	44.30037	2650.73	57.8	92.266	259.468	1.11534	0.214	0.303	4171.
800	43.23840	2606.64	53.9	103.252	274.562	1.13482	0.212	0.301	4137.
850	42.22961	2569.87	50.6	114.130	289.531	1.15297	0.211	0.298	4107.
900	41.26974	2539.41	47.6	124.923	304.404	1.16997	0.209	0.297	4082.
950	40.35511	2514.39	44.9	135.655	319.204	1.18598	0.209	0.295	4060.
1000	39.48248	2494.10	42.5	146.343	333.949	1.20110	0.208	0.294	4042.
1100	37.85195	2465.33	39.4	167.655	363.342	1.22912	0.208	0.294	4012.
1200	36.35828	2449.21	35.0	188.960	392.686	1.25465	0.209	0.293	3990.
1300	34.98505	2442.92	32.2	210.329	422.052	1.27816	0.210	0.294	3976.
1400	33.71838	2444.32	29.8	231.808	451.485	1.29997	0.212	0.295	3967.
1500	32.54643	2451.82	27.7	253.429	481.016	1.32034	0.214	0.296	3963.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

45000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*207.245	62.24776	5794.27	163.0	-42.580	91.289	0.66987	0.243	0.288	5644.
210	62.16901	5704.37	165.6	-41.947	92.092	0.67371	0.245	0.294	5625.
215	62.01997	5550.43	169.6	-40.777	93.584	0.68074	0.249	0.303	5590.
220	61.86366	5407.83	172.7	-39.579	95.121	0.68780	0.253	0.312	5556.
225	61.70083	5275.93	175.0	-38.357	96.698	0.69489	0.256	0.319	5524.
230	61.53220	5154.07	176.6	-37.112	98.314	0.70199	0.259	0.327	5492.
235	61.35847	5041.60	177.5	-35.845	99.964	0.70909	0.261	0.333	5461.
240	61.18030	4937.89	177.9	-34.560	101.645	0.71617	0.263	0.339	5432.
245	60.99432	4842.24	177.9	-33.257	103.354	0.72322	0.265	0.344	5403.
250	60.81314	4754.08	177.4	-31.940	105.087	0.73022	0.266	0.349	5375.
260	60.43529	4597.80	175.6	-29.269	108.615	0.74406	0.268	0.356	5322.
270	60.05068	4464.58	172.7	-26.559	112.207	0.75761	0.269	0.362	5273.
280	59.66254	4350.47	169.2	-23.825	115.845	0.77084	0.270	0.365	5227.
290	59.27348	4252.09	165.3	-21.074	119.512	0.78371	0.269	0.368	5185.
300	58.88555	4166.56	161.2	-18.317	123.195	0.79620	0.269	0.369	5145.
320	58.11894	4025.03	152.6	-12.807	130.572	0.82000	0.267	0.368	5074.
340	57.37080	3911.67	144.2	-7.331	137.917	0.84227	0.264	0.366	5010.
360	56.64498	3817.24	136.3	-1.913	145.197	0.86307	0.261	0.362	4954.
380	55.94280	3735.86	128.9	3.438	152.394	0.88253	0.258	0.358	4902.
400	55.26415	3663.77	122.2	8.716	159.501	0.90076	0.254	0.353	4856.
420	54.60815	3598.63	116.1	13.919	166.516	0.91787	0.251	0.348	4813.
440	53.97361	3538.89	110.5	19.050	173.441	0.93398	0.248	0.344	4773.
460	53.35920	3483.57	105.3	24.111	180.280	0.94918	0.245	0.340	4736.
480	52.76361	3432.01	100.7	29.106	187.038	0.96356	0.242	0.336	4701.
500	52.18560	3383.73	96.4	34.038	193.719	0.97720	0.239	0.332	4669.
520	51.62401	3339.42	92.4	38.910	200.328	0.99016	0.236	0.329	4639.
540	51.07778	3295.81	88.8	43.728	206.872	1.00251	0.234	0.326	4610.
560	50.54598	3255.72	85.4	48.494	213.354	1.01430	0.232	0.323	4584.
580	50.02775	3217.96	82.3	53.212	219.780	1.02557	0.230	0.320	4559.
600	49.52232	3182.42	79.4	57.885	226.153	1.03637	0.228	0.317	4535.
650	48.31038	3102.38	73.0	69.394	241.884	1.06156	0.223	0.312	4481.
700	47.16524	3033.65	67.6	80.690	257.368	1.08451	0.220	0.308	4435.
750	46.07974	2974.78	62.9	91.812	272.652	1.10560	0.217	0.304	4395.
800	45.04817	2924.50	58.9	102.796	287.776	1.12513	0.215	0.301	4360.
850	44.06580	2881.73	55.3	113.670	302.774	1.14331	0.213	0.299	4329.
900	43.12868	2845.51	52.1	124.461	317.674	1.16034	0.212	0.297	4302.
950	42.23341	2815.02	49.3	135.190	332.499	1.17638	0.211	0.296	4279.
1000	41.37703	2789.56	46.7	145.878	347.271	1.19153	0.210	0.295	4258.
1100	39.77078	2751.36	42.4	167.190	376.717	1.21960	0.210	0.294	4224.
1200	38.29208	2726.95	38.7	188.500	406.118	1.24518	0.211	0.294	4199.
1300	36.92623	2713.38	35.6	209.878	435.545	1.26873	0.212	0.295	4180.
1400	35.66083	2708.41	33.0	231.372	465.046	1.29059	0.213	0.295	4168.
1500	34.48527	2710.33	30.7	253.010	494.650	1.31102	0.215	0.297	4160.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

50000 PSIA ISORAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*215.576	62.85591	6198.26	162.0	-40.171	107.134	0.67480	0.245	0.297	5908.
220	62.73736	6053.76	166.1	-39.158	108.424	0.68073	0.249	0.296	5777.
225	62.59676	5901.17	169.8	-37.989	109.925	0.68747	0.253	0.305	5742.
230	62.44976	5759.39	172.8	-36.793	111.469	0.69426	0.256	0.313	5708.
235	62.29700	5627.82	175.0	-35.574	113.052	0.70107	0.259	0.320	5675.
240	62.13910	5505.86	176.5	-34.333	114.670	0.70789	0.262	0.327	5644.
245	61.97664	5392.90	177.5	-33.072	116.321	0.71469	0.264	0.333	5613.
250	61.81020	5288.35	178.0	-31.794	118.002	0.72148	0.266	0.339	5584.
260	61.46749	5102.12	177.7	-29.192	121.439	0.73496	0.269	0.348	5528.
270	61.11491	4942.69	176.1	-26.543	124.958	0.74824	0.271	0.355	5477.
280	60.75584	4805.96	173.7	-23.857	128.538	0.76126	0.272	0.361	5429.
290	60.39312	4688.26	170.5	-21.148	132.163	0.77398	0.273	0.364	5385.
300	60.02907	4586.42	167.0	-18.424	135.816	0.78636	0.273	0.366	5344.
320	59.30403	4419.82	159.2	-12.963	143.164	0.81007	0.271	0.368	5270.
340	58.59100	4289.27	151.2	-7.518	150.509	0.83234	0.269	0.366	5206.
360	57.89567	4183.22	143.4	-2.117	157.808	0.85320	0.266	0.363	5149.
380	57.22067	4094.04	136.0	3.224	165.035	0.87274	0.262	0.359	5098.
400	56.56683	4016.70	129.2	8.498	172.179	0.89106	0.259	0.355	5052.
420	55.93392	3947.94	122.9	13.700	179.233	0.90827	0.255	0.350	5011.
440	55.32117	3885.63	117.2	18.832	186.199	0.92447	0.252	0.346	4972.
460	54.72752	3828.34	111.9	23.894	193.077	0.93976	0.249	0.342	4936.
480	54.15183	3775.16	107.0	28.891	199.872	0.95422	0.246	0.338	4903.
500	53.59298	3725.43	102.6	33.825	206.589	0.96793	0.243	0.334	4872.
520	53.04987	3678.70	98.5	38.700	213.232	0.98096	0.240	0.330	4843.
540	52.52150	3634.67	94.7	43.519	219.808	0.99337	0.238	0.327	4815.
560	52.00694	3593.09	91.3	48.286	226.319	1.00521	0.235	0.324	4789.
580	51.50537	3553.77	88.0	53.006	232.772	1.01653	0.233	0.321	4765.
600	51.01601	3516.57	85.0	57.680	239.171	1.02738	0.231	0.319	4742.
650	49.84177	3432.03	78.3	69.189	254.956	1.05265	0.226	0.313	4689.
700	48.73079	3358.39	72.7	80.484	270.486	1.07567	0.223	0.308	4643.
750	47.67604	3294.35	67.8	91.604	285.809	1.09682	0.220	0.305	4603.
800	46.67191	3238.81	63.5	102.584	300.967	1.11638	0.217	0.302	4567.
850	45.71385	3190.80	59.8	113.454	315.595	1.13460	0.215	0.299	4536.
900	44.79806	3149.46	56.4	124.241	330.922	1.15167	0.214	0.298	4508.
950	43.92136	3114.02	53.4	134.967	345.774	1.16773	0.213	0.296	4483.
1000	43.08099	3083.90	50.8	145.651	360.570	1.18291	0.212	0.296	4461.
1100	41.49981	3036.78	46.1	166.958	390.066	1.21102	0.212	0.295	4425.
1200	40.03819	3004.48	42.3	188.265	419.518	1.23665	0.212	0.295	4396.
1300	38.68277	2987.90	39.0	209.644	449.000	1.26025	0.213	0.295	4374.
1400	37.42231	2972.73	36.2	231.142	478.560	1.28215	0.215	0.296	4358.
1500	36.24721	2969.17	33.7	252.788	508.227	1.30262	0.216	0.297	4348.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

60000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHOKE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*231.515	63.98574	6981.56	158.7	-35.247	138.396	0.68405	0.249	0.287	6104.
235	63.90498	6864.46	162.0	-34.456	139.407	0.68838	0.252	0.293	6078.
240	63.78402	6705.59	166.1	-33.300	140.893	0.69464	0.256	0.301	6042.
245	63.65750	6557.03	169.3	-32.120	142.419	0.70093	0.260	0.309	6008.
250	63.52592	6418.27	172.0	-30.918	143.983	0.70725	0.263	0.316	5975.
260	63.24943	6168.02	175.5	-28.455	147.210	0.71991	0.269	0.329	5913.
270	62.95916	5950.70	177.0	-25.926	150.552	0.73252	0.273	0.339	5856.
280	62.65542	5762.28	177.2	-23.346	153.985	0.74500	0.275	0.347	5803.
290	62.34416	5598.99	176.2	-20.725	157.491	0.75731	0.277	0.354	5754.
300	62.02696	5457.33	174.3	-18.076	161.052	0.76938	0.278	0.359	5709.
320	61.38328	5226.70	169.9	-12.725	168.281	0.79270	0.278	0.364	5630.
340	60.73794	5049.52	162.3	-7.352	175.577	0.81482	0.276	0.365	5562.
360	60.09982	4910.23	155.3	-1.994	182.877	0.83568	0.274	0.364	5503.
380	59.47427	4797.67	149.3	3.323	190.138	0.85531	0.270	0.362	5452.
400	58.86420	4704.03	141.5	8.585	197.336	0.87377	0.267	0.358	5406.
420	58.27090	4623.92	135.2	13.785	204.458	0.89115	0.263	0.354	5365.
440	57.69466	4553.66	129.3	18.919	211.497	0.90752	0.260	0.350	5328.
460	57.13520	4490.74	123.8	23.987	218.451	0.92298	0.257	0.346	5294.
480	56.59189	4433.41	118.7	28.991	225.321	0.93760	0.253	0.341	5263.
500	56.06394	4380.50	114.0	33.932	232.112	0.95146	0.250	0.338	5233.
520	55.55051	4331.16	109.7	38.814	238.826	0.96463	0.247	0.334	5206.
540	55.05075	4284.83	105.7	43.641	245.467	0.97716	0.244	0.330	5180.
560	54.56385	4241.09	101.9	48.414	252.042	0.98911	0.242	0.327	5156.
580	54.08902	4199.63	98.5	53.139	258.554	1.00054	0.239	0.324	5133.
600	53.62557	4160.24	95.3	57.817	265.008	1.01148	0.237	0.321	5112.
650	52.51253	4069.76	88.1	69.334	280.916	1.03695	0.232	0.315	5062.
700	51.45786	3989.38	82.0	80.631	296.550	1.06012	0.228	0.310	5018.
750	50.45464	3917.90	76.7	91.748	311.960	1.08139	0.224	0.306	4979.
800	49.49738	3854.43	72.1	102.722	327.193	1.10105	0.222	0.303	4944.
850	48.58166	3798.20	68.1	113.584	342.286	1.11935	0.219	0.301	4912.
900	47.70387	3748.52	64.5	124.361	357.272	1.13649	0.218	0.299	4883.
950	46.86102	3704.78	61.2	135.076	372.176	1.15260	0.216	0.297	4857.
1000	46.05058	3666.41	58.3	145.750	387.022	1.16783	0.216	0.296	4834.
1100	44.51848	3603.80	53.2	167.035	416.610	1.19603	0.215	0.296	4793.
1200	43.09314	3557.11	48.9	188.324	446.154	1.22174	0.215	0.295	4760.
1300	41.76305	3523.47	45.3	209.688	475.730	1.24541	0.216	0.296	4734.
1400	40.51866	3500.54	42.2	231.177	505.390	1.26739	0.217	0.297	4713.
1500	39.35185	3486.44	39.4	252.820	535.163	1.28793	0.218	0.298	4697.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

70000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*246.626	65.02356	7736.70	154.1	-30.182	169.169	0.69270	0.253	0.286	6367.
250	64.95509	7621.28	157.4	-29.416	170.145	0.69663	0.256	0.292	6342.
260	64.73854	7306.02	165.1	-27.086	173.143	0.70839	0.264	0.307	6273.
270	64.50402	7027.99	170.4	-24.678	176.279	0.72022	0.270	0.320	6209.
280	64.25447	6783.52	173.7	-22.204	179.533	0.73205	0.275	0.331	6150.
290	63.99267	6569.03	175.4	-19.678	182.895	0.74381	0.278	0.339	6096.
300	63.72116	6381.10	175.9	-17.110	186.316	0.75544	0.280	0.346	6047.
320	63.15784	6072.22	173.9	-11.888	193.351	0.77814	0.282	0.356	5959.
340	62.57965	5834.19	169.7	-6.605	200.531	0.79991	0.282	0.361	5886.
360	61.99764	5648.74	164.1	-1.306	207.774	0.82061	0.280	0.363	5823.
380	61.41945	5501.80	159.0	3.975	215.024	0.84020	0.277	0.362	5769.
400	60.84997	5382.90	151.8	9.217	222.241	0.85872	0.274	0.360	5721.
420	60.29214	5284.42	145.7	14.409	229.404	0.87619	0.271	0.356	5680.
440	59.74753	5200.88	139.8	19.542	236.497	0.89269	0.267	0.353	5643.
460	59.21679	5128.37	134.3	24.614	243.513	0.90828	0.263	0.349	5609.
480	58.70000	5064.13	129.1	29.624	250.451	0.92305	0.260	0.345	5579.
500	58.19686	5006.19	124.3	34.574	257.309	0.93705	0.257	0.341	5551.
520	57.70691	4953.14	119.8	39.465	264.091	0.95035	0.254	0.337	5525.
540	57.22953	4904.00	115.6	44.300	270.800	0.96301	0.251	0.334	5501.
560	56.76411	4858.04	111.7	49.081	277.439	0.97508	0.248	0.330	5478.
580	56.31000	4814.74	108.0	53.813	284.012	0.98661	0.245	0.327	5457.
600	55.86657	4773.73	104.6	58.498	290.525	0.99765	0.243	0.324	5437.
650	54.80098	4679.50	97.0	70.027	306.565	1.02333	0.237	0.318	5391.
700	53.79038	4595.15	90.6	81.330	322.312	1.04668	0.232	0.312	5349.
750	52.82810	4519.16	85.0	92.448	337.819	1.06808	0.229	0.308	5312.
800	51.90874	4450.59	80.1	103.418	353.136	1.08795	0.226	0.305	5278.
850	51.02793	4388.76	75.7	114.273	368.301	1.10623	0.223	0.302	5247.
900	50.18215	4333.12	71.9	125.040	383.349	1.12344	0.221	0.300	5219.
950	49.36947	4283.17	68.4	135.743	398.310	1.13962	0.220	0.298	5193.
1000	48.58446	4238.48	65.3	146.403	413.206	1.15490	0.219	0.297	5169.
1100	47.09746	4163.18	59.8	167.659	442.887	1.18319	0.217	0.296	5127.
1200	45.70772	4104.22	55.2	188.919	472.515	1.20897	0.217	0.296	5091.
1300	44.40481	4059.02	51.2	210.257	502.174	1.23271	0.218	0.297	5062.
1400	43.18023	4025.39	47.8	231.722	531.918	1.25475	0.219	0.298	5037.
1500	42.02685	4001.48	44.8	253.345	561.779	1.27535	0.220	0.299	5018.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

80000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*261.033	65.98863	8467.70	148.7	-24.986	199.511	0.70088	0.257	0.286	6608.
270	65.82357	8166.38	156.9	-22.926	202.135	0.71076	0.264	0.299	6544.
280	65.62315	7865.17	163.8	-20.557	205.191	0.72187	0.271	0.312	6478.
290	65.40786	7597.55	168.6	-18.126	208.365	0.73300	0.276	0.323	6419.
300	65.18004	7360.29	171.8	-15.644	211.639	0.74410	0.279	0.332	6364.
320	64.69530	6964.67	174.2	-10.563	218.422	0.76599	0.284	0.345	6268.
340	64.18414	6655.48	173.1	-5.385	225.424	0.78721	0.285	0.354	6187.
360	63.65869	6413.17	169.7	-0.162	232.553	0.80758	0.284	0.358	6118.
380	63.12809	6221.75	165.1	5.069	239.739	0.82701	0.282	0.360	6060.
400	62.59888	6068.61	159.9	10.279	246.934	0.84546	0.280	0.359	6010.
420	62.07552	5944.09	154.4	15.453	254.102	0.86295	0.276	0.357	5967.
440	61.56083	5840.94	148.9	20.578	261.222	0.87951	0.273	0.355	5929.
460	61.05641	5753.77	143.5	25.648	268.280	0.89520	0.269	0.351	5895.
480	60.56343	5678.62	138.4	30.661	275.269	0.91007	0.266	0.348	5865.
500	60.08194	5612.58	133.5	35.616	282.184	0.92419	0.262	0.344	5837.
520	59.61201	5553.55	128.9	40.514	289.026	0.93760	0.259	0.340	5812.
540	59.15339	5499.95	124.6	45.357	295.795	0.95038	0.256	0.337	5789.
560	58.70571	5450.66	120.6	50.146	302.495	0.96256	0.253	0.333	5767.
580	58.26850	5404.84	116.8	54.886	309.128	0.97420	0.250	0.330	5747.
600	57.84130	5361.86	113.2	59.578	315.697	0.98533	0.248	0.327	5728.
650	56.81385	5264.14	105.3	71.121	331.872	1.01123	0.242	0.320	5685.
700	55.83863	5177.06	98.5	82.432	347.737	1.03475	0.237	0.315	5646.
750	54.90940	5098.31	92.6	93.553	363.348	1.05629	0.233	0.310	5612.
800	54.02093	5026.62	87.4	104.521	378.753	1.07618	0.229	0.306	5580.
850	53.16495	4961.22	82.8	115.370	393.996	1.09466	0.226	0.303	5550.
900	52.34999	4901.58	78.8	126.127	409.113	1.11194	0.224	0.301	5523.
950	51.56114	4847.26	75.1	136.818	424.133	1.12818	0.223	0.300	5498.
1000	50.80002	4797.90	71.8	147.464	439.084	1.14352	0.221	0.298	5474.
1100	49.35317	4712.78	66.0	168.689	468.858	1.17190	0.220	0.297	5431.
1200	47.99650	4643.76	61.1	189.915	498.569	1.19775	0.220	0.297	5395.
1300	46.72016	4589.68	56.8	211.219	528.305	1.22155	0.220	0.298	5363.
1400	45.51632	4545.58	53.2	232.652	558.124	1.24365	0.221	0.299	5337.
1500	44.37848	4512.79	49.9	254.246	588.063	1.26431	0.222	0.300	5315.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

90000 PSIA ISORAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*274.835	66.89418	9177.24	142.8	-19.680	229.461	0.70864	0.259	0.285	6831.
280	66.81151	8957.79	148.0	-18.498	230.951	0.71401	0.264	0.292	6794.
290	66.63915	8677.42	156.1	-16.160	233.934	0.72448	0.271	0.304	6727.
300	66.45229	8390.29	162.3	-13.763	237.035	0.73499	0.276	0.315	6666.
320	66.04288	7904.23	169.8	-8.830	243.523	0.75592	0.283	0.332	6560.
340	65.59769	7517.65	172.5	-3.768	250.297	0.77645	0.286	0.344	6471.
360	65.12899	7210.82	172.0	1.366	257.260	0.79635	0.287	0.352	6396.
380	64.64671	6966.76	169.4	6.532	264.334	0.81547	0.286	0.355	6333.
400	64.15849	6771.46	165.6	11.697	271.462	0.83375	0.284	0.357	6279.
420	63.66997	6613.63	161.1	16.841	278.598	0.85116	0.281	0.357	6233.
440	63.18514	6484.47	156.3	21.948	285.714	0.86771	0.278	0.355	6193.
460	62.70669	6377.16	151.3	27.009	292.787	0.88343	0.275	0.352	6158.
480	62.23634	6286.52	146.5	32.019	299.806	0.89837	0.271	0.349	6127.
500	61.77510	6208.65	141.7	36.975	306.761	0.91256	0.268	0.346	6099.
520	61.32347	6140.61	137.2	41.876	313.649	0.92607	0.264	0.343	6074.
540	60.88163	6080.18	132.8	46.724	320.469	0.93894	0.261	0.339	6052.
560	60.44951	6025.71	128.7	51.519	327.222	0.95122	0.258	0.336	6031.
580	60.02691	5975.98	124.9	56.265	333.909	0.96275	0.255	0.333	6011.
600	59.61353	5930.03	121.2	60.964	340.532	0.97418	0.252	0.330	5993.
650	58.61803	5827.55	113.0	72.520	356.836	1.00029	0.246	0.323	5952.
700	57.67207	5737.73	105.9	83.840	372.820	1.02398	0.241	0.317	5917.
750	56.77006	5656.95	99.8	94.965	388.536	1.04567	0.236	0.312	5884.
800	55.90713	5583.29	94.3	105.933	404.035	1.06567	0.233	0.308	5854.
850	55.07916	5515.69	89.5	116.776	419.360	1.08426	0.230	0.305	5827.
900	54.28273	5453.49	85.3	127.525	434.549	1.10162	0.227	0.303	5801.
950	53.51499	5396.26	81.4	138.205	449.633	1.11793	0.225	0.301	5776.
1000	52.77356	5343.66	77.9	148.837	464.641	1.13333	0.224	0.300	5754.
1100	51.36196	5251.26	71.8	170.030	494.513	1.16180	0.222	0.298	5712.
1200	50.03522	5174.33	66.6	191.220	524.307	1.18772	0.222	0.298	5675.
1300	48.78379	5111.08	62.2	212.486	554.118	1.21159	0.222	0.298	5643.
1400	47.60023	5059.87	58.3	233.882	584.008	1.23374	0.223	0.299	5615.
1500	46.47846	5019.22	54.8	255.440	614.017	1.25444	0.224	0.301	5591.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

100000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*288.106	67.74978	9867.14	136.6	-14.280	259.047	0.71603	0.261	0.283	7040.
290	67.72328	9799.58	138.6	-13.849	259.585	0.71789	0.263	0.286	7026.
300	67.57426	9467.48	147.9	-11.534	262.503	0.72778	0.270	0.298	6959.
320	67.23593	8886.64	160.9	-6.749	268.668	0.74767	0.280	0.318	6841.
340	66.85444	8419.79	167.9	-1.811	275.177	0.76740	0.285	0.332	6742.
360	66.44189	8047.69	170.8	3.225	281.932	0.78670	0.288	0.342	6660.
380	66.00825	7741.14	170.8	8.313	288.852	0.80541	0.288	0.349	6591.
400	65.56176	7497.36	169.9	13.421	295.871	0.82341	0.287	0.352	6533.
420	65.10991	7299.98	165.8	18.523	302.937	0.84064	0.285	0.354	6493.
440	64.65458	7138.93	162.0	23.602	310.014	0.85711	0.282	0.354	6440.
460	64.20735	7006.18	157.7	28.644	317.074	0.87280	0.279	0.352	6403.
480	63.75473	6895.41	153.3	33.643	324.098	0.88774	0.276	0.350	6371.
500	63.31340	6801.71	148.9	38.594	331.073	0.90198	0.272	0.347	6343.
520	62.87944	6721.28	144.5	43.494	337.992	0.91555	0.269	0.344	6317.
540	62.45347	6651.22	140.3	48.343	344.849	0.92949	0.265	0.341	6295.
560	62.03580	6589.29	136.2	53.141	351.644	0.94085	0.262	0.338	6274.
580	61.62649	6533.78	132.4	57.891	358.377	0.95266	0.259	0.335	6255.
600	61.22549	6483.39	128.7	62.594	365.047	0.96397	0.256	0.332	6238.
650	60.25795	6373.80	120.3	74.161	381.471	0.99026	0.250	0.325	6199.
700	59.33699	6280.24	112.9	85.489	397.569	1.01412	0.244	0.319	6165.
750	58.45799	6197.31	105.5	96.618	413.391	1.03596	0.240	0.314	6135.
800	57.61654	6122.13	100.9	107.586	428.994	1.05609	0.236	0.310	6107.
850	56.80879	6053.10	95.9	118.426	444.394	1.07477	0.233	0.307	6081.
900	56.03143	5989.33	91.4	129.167	459.658	1.09222	0.230	0.304	6057.
950	55.28168	5930.26	87.4	139.836	474.809	1.10861	0.228	0.302	6034.
1000	54.55719	5875.52	83.7	150.455	489.876	1.12406	0.226	0.301	6012.
1100	53.17637	5778.00	77.3	171.616	519.851	1.15263	0.224	0.299	5972.
1200	51.87637	5695.06	71.9	192.769	549.730	1.17863	0.224	0.299	5936.
1300	50.64780	5625.29	67.2	213.996	579.616	1.20255	0.224	0.299	5904.
1400	49.48341	5567.32	63.2	235.352	609.576	1.22476	0.224	0.300	5875.
1500	48.37740	5519.89	59.5	256.872	639.651	1.24550	0.225	0.301	5850.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

110000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*300.008	68.56263	10538.68	130.1	-8.805	288.290	0.72308	0.262	0.281	7238.
320	68.30145	9905.79	147.8	-4.371	293.861	0.74102	0.274	0.302	7112.
340	67.98094	9358.16	159.6	0.442	300.090	0.75986	0.282	0.319	7004.
360	67.62295	8910.43	165.2	5.372	306.596	0.77848	0.287	0.332	6914.
380	67.23761	8545.67	169.3	10.374	313.324	0.79667	0.288	0.341	6838.
400	66.83323	8248.84	169.7	15.414	320.197	0.81430	0.288	0.346	6774.
420	66.41674	8006.93	169.4	20.464	327.158	0.83129	0.287	0.349	6721.
440	65.99371	7809.01	165.9	25.503	334.164	0.84757	0.285	0.351	6675.
460	65.56839	7646.06	162.6	30.518	341.181	0.86317	0.282	0.351	6635.
480	65.14400	7510.78	158.9	35.493	348.194	0.87807	0.279	0.350	6601.
500	64.72285	7397.37	155.0	40.436	355.157	0.89230	0.276	0.348	6572.
520	64.30657	7301.08	150.9	45.323	362.037	0.90589	0.273	0.345	6545.
540	63.89625	7218.42	146.9	50.174	368.966	0.91888	0.269	0.343	6522.
560	63.49257	7146.50	143.0	54.971	375.791	0.93128	0.265	0.340	6501.
580	63.09524	7083.11	139.2	59.721	382.558	0.94316	0.263	0.337	6482.
600	62.70653	7026.52	135.5	64.426	389.267	0.95453	0.260	0.334	6465.
650	61.76451	6906.70	127.1	76.000	405.795	0.98099	0.253	0.327	6428.
700	60.86568	6807.68	119.6	87.334	422.000	1.00501	0.248	0.321	6396.
750	60.00663	6721.84	113.0	98.466	437.923	1.02697	0.243	0.316	6367.
800	59.19363	6644.99	107.1	109.434	453.611	1.04724	0.239	0.312	6341.
850	58.39317	6574.83	101.9	120.269	469.106	1.06603	0.235	0.308	6317.
900	57.63213	6510.03	97.3	131.004	484.446	1.08357	0.233	0.306	6295.
950	56.99782	6449.93	93.1	141.663	499.667	1.10002	0.230	0.303	6273.
1000	56.18795	6393.76	89.3	152.269	514.796	1.11555	0.229	0.302	6253.
1100	54.83399	6292.82	82.6	173.398	544.877	1.14422	0.227	0.300	6215.
1200	53.55774	6205.55	77.0	194.515	574.845	1.17029	0.226	0.300	6180.
1300	52.34999	6130.73	72.1	215.702	604.808	1.19428	0.225	0.300	6148.
1400	51.20329	6067.28	67.8	237.018	634.837	1.21653	0.224	0.301	6119.
1500	50.11229	6014.17	64.0	258.496	664.976	1.23732	0.227	0.302	6094.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

120000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP	VELOCITY OF SOUND FT/SEC
*313.291	69.33839	11192.80	123.7	-3.269	317.209	0.72979	0.262	0.278	7425.
320	69.26120	10955.22	130.9	-1.736	319.100	0.73577	0.266	0.296	7379.
340	68.99786	10327.82	147.7	2.952	325.012	0.75360	0.277	0.305	7258.
360	68.69252	9807.84	158.5	7.773	331.264	0.77155	0.284	0.320	7158.
380	68.35449	9378.88	164.8	12.683	337.774	0.78914	0.287	0.331	7075.
400	67.99204	9025.98	169.0	17.646	344.470	0.80631	0.288	0.338	7006.
420	67.61231	8735.89	169.7	22.634	351.294	0.82296	0.288	0.344	6947.
440	67.22120	8497.12	167.9	27.626	358.198	0.83902	0.287	0.346	6898.
460	66.82353	8299.95	165.8	32.603	365.143	0.85445	0.285	0.348	6856.
480	66.42304	8136.26	163.1	37.555	372.100	0.86976	0.282	0.348	6819.
500	66.02260	7999.44	159.8	42.473	379.047	0.88343	0.279	0.347	6788.
520	65.62436	7884.09	156.3	47.352	385.968	0.89701	0.276	0.345	6761.
540	65.22986	7785.90	152.7	52.188	392.851	0.91000	0.273	0.343	6737.
560	64.84018	7701.42	149.0	56.979	399.690	0.92243	0.270	0.341	6715.
580	64.45605	7627.91	145.4	61.727	406.480	0.93435	0.267	0.338	6696.
600	64.07790	7563.21	141.8	66.430	413.217	0.94577	0.264	0.336	6679.
650	63.16005	7479.61	133.4	78.004	429.831	0.97237	0.257	0.329	6642.
700	62.28150	7322.92	125.9	89.340	446.131	0.99653	0.251	0.323	6611.
750	61.44027	7232.90	119.1	100.474	462.150	1.01863	0.246	0.318	6585.
800	60.63346	7153.91	113.1	111.441	477.929	1.03900	0.241	0.313	6551.
850	59.85803	7082.40	107.8	122.272	493.508	1.05789	0.238	0.310	6538.
900	59.11112	7016.77	102.9	133.000	508.926	1.07552	0.235	0.307	6517.
950	58.39019	6955.86	98.6	143.649	524.217	1.09206	0.233	0.305	6497.
1000	57.69302	6898.99	94.6	154.243	539.410	1.10764	0.231	0.303	6478.
1100	56.36255	6795.93	87.7	175.342	569.601	1.13642	0.228	0.301	6442.
1200	55.10735	6705.68	81.9	196.422	599.661	1.16257	0.227	0.300	6408.
1300	53.91816	6627.12	76.8	217.570	629.703	1.18662	0.227	0.301	6378.
1400	52.78798	6559.37	72.3	238.844	659.801	1.20893	0.227	0.301	6350.
1500	51.71093	6501.59	68.4	260.280	690.004	1.22976	0.228	0.303	6324.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

130000 PSIA 150000

TEMPERATURE	DENSITY	ISOTHERM	ISOCORE	INTERNAL	ENTHALPY	ENTROPY	CV	CP	VELOCITY
DEG R	LB/ CU FT	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB - R	LB - R	OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
*325.296	70.09155	11830.21	117.2	2.316	345.819	0.73620	0.261	0.275	7603.
340	69.92241	11323.63	132.5	5.609	349.974	0.74869	0.270	0.290	7506.
360	69.66709	10731.93	147.6	10.400	355.947	0.76576	0.279	0.307	7396.
380	69.37498	10238.05	157.6	15.214	362.216	0.78270	0.284	0.320	7305.
400	69.05372	9827.36	163.7	20.094	368.710	0.79936	0.287	0.329	7229.
420	68.71069	9486.59	166.9	25.013	375.370	0.81560	0.288	0.336	7165.
440	68.35198	9201.99	167.9	29.948	382.144	0.83136	0.287	0.341	7111.
460	67.98241	8969.36	167.4	34.880	388.990	0.84657	0.286	0.344	7066.
480	67.60646	8773.99	165.8	39.796	395.875	0.86122	0.284	0.345	7027.
500	67.22736	8610.60	163.5	44.687	402.774	0.87531	0.281	0.345	6994.
520	66.84768	8473.13	160.7	49.545	409.665	0.88882	0.278	0.344	6965.
540	66.46940	8356.65	157.5	54.365	416.535	0.90178	0.276	0.343	6940.
560	66.09397	8257.11	154.3	59.145	423.373	0.91422	0.273	0.341	6918.
580	65.72243	8171.28	150.9	63.885	430.171	0.92615	0.270	0.339	6899.
600	65.35553	8096.52	147.5	68.582	436.925	0.93759	0.267	0.337	6881.
650	64.46127	7945.34	139.4	80.150	453.602	0.96430	0.260	0.331	6845.
700	63.60188	7828.45	131.8	91.485	469.983	0.98858	0.254	0.325	6815.
750	62.77701	7732.68	125.0	102.617	486.089	1.01080	0.248	0.320	6789.
800	61.98476	7650.45	118.9	113.581	501.954	1.03128	0.244	0.315	6767.
850	61.22264	7577.35	113.3	124.408	517.616	1.05027	0.240	0.311	6746.
900	60.48815	7510.82	108.4	135.128	533.110	1.06799	0.237	0.308	6727.
950	59.77893	7449.34	103.9	145.763	548.472	1.08460	0.235	0.306	6708.
1000	59.09287	7392.00	99.8	156.350	563.729	1.10025	0.233	0.304	6690.
1100	57.78303	7287.73	92.7	177.419	594.034	1.12914	0.230	0.302	6656.
1200	56.54649	7195.59	86.6	198.464	624.199	1.15537	0.229	0.301	6625.
1300	55.37405	7114.40	81.3	219.573	654.311	1.17949	0.228	0.301	6595.
1400	54.25864	7043.40	76.7	240.805	684.480	1.20184	0.229	0.302	6567.
1500	53.19472	6981.91	72.6	262.199	714.748	1.22273	0.229	0.303	6543.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

140000 PSIA ISOBAR

TEMPERATURE DEG R	DENSITY LB/ CU FT	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB - R	CP BTU / LB - R	VELOCITY OF SOUND FT/SEC
*336.959 340	70.79580 70.76819	12451.47 12340.76	110.7 114.3	7.940 8.627	374.134 374.964	0.74232 0.74478	0.259 0.261	0.271 0.275	7773. 7752.
360	70.56020	11678.55	134.0	13.230	380.647	0.76101	0.272	0.293	7629.
380	70.31199	11119.94	147.8	17.945	386.659	0.77726	0.280	0.308	7528.
400	70.03107	10650.69	157.1	22.739	392.932	0.79335	0.284	0.319	7445.
420	69.72432	10257.71	162.9	27.582	399.404	0.80913	0.286	0.329	7375.
440	69.39785	9929.19	166.1	32.453	406.024	0.82453	0.287	0.334	7317.
460	69.05693	9654.61	167.3	37.332	412.747	0.83947	0.286	0.338	7268.
480	68.70603	9424.89	167.1	42.205	419.538	0.85392	0.285	0.341	7226.
500	68.34882	9232.22	165.9	47.061	426.365	0.86786	0.283	0.342	7191.
520	67.98826	9069.99	163.9	51.891	433.207	0.88127	0.280	0.342	7160.
540	67.62668	8932.70	161.4	56.690	440.045	0.89418	0.278	0.342	7134.
560	67.26588	8815.79	158.7	61.453	446.865	0.90658	0.275	0.340	7111.
580	66.90722	8715.51	155.7	66.180	453.657	0.91850	0.272	0.339	7091.
600	66.55172	8628.80	152.6	70.868	460.415	0.92995	0.269	0.337	7073.
650	65.68102	8456.20	144.8	82.421	477.131	0.95672	0.262	0.332	7036.
700	64.84020	8326.42	137.4	93.748	493.577	0.98109	0.256	0.326	7007.
750	64.03076	8223.09	130.6	104.875	509.759	1.00342	0.251	0.321	6983.
800	63.25189	8136.56	124.3	115.835	525.704	1.02401	0.246	0.317	6962.
850	62.50180	8061.14	118.7	126.656	541.444	1.04309	0.243	0.313	6943.
900	61.77839	7993.40	113.6	137.368	557.013	1.06089	0.239	0.310	6925.
950	61.07954	7931.31	109.0	147.998	572.445	1.07758	0.237	0.307	6907.
1000	60.40328	7873.63	104.8	158.568	587.767	1.09330	0.235	0.306	6891.
1100	59.11166	7768.76	97.4	179.609	618.186	1.12229	0.232	0.303	6859.
1200	57.89170	7675.57	91.1	200.619	648.438	1.14862	0.230	0.302	6829.
1300	56.73428	7592.67	85.7	221.689	678.644	1.17279	0.230	0.302	6801.
1400	55.63237	7519.33	80.9	242.880	708.886	1.19520	0.230	0.303	6774.
1500	54.58044	7454.97	76.7	264.231	739.219	1.21613	0.230	0.304	6750.

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

150000 PSIA ISORAR									
TEMPERATURE	DENSITY	ISOTHERM	ISOCNORE	INTERNAL	ENTHALPY	ENTROPY	CV	CP	VELOCITY
DEG R	LB/ CU FT	DERIVATIVE	DERIVATIVE	ENERGY	BTU/LB	BTU/LB-R	BTU / LB - R		OF SOUND
		CU FT-PSIA/LB	PSIA/R	BTU/LB					FT/SEC
*348.309	71.49420	13057.06	104.3	13.594	402.167	0.74817	0.257	0.268	7935.
360	71.38302	12643.79	117.6	16.240	405.363	0.75720	0.265	0.279	7858.
380	71.17680	12021.20	135.4	20.857	411.107	0.77272	0.274	0.295	7746.
400	70.93481	11493.33	148.1	25.561	417.143	0.78820	0.280	0.308	7654.
420	70.66362	11047.35	156.7	30.326	423.411	0.80348	0.284	0.318	7579.
440	70.36924	10671.50	162.3	35.127	429.857	0.81848	0.285	0.326	7515.
460	70.05697	10355.19	165.5	39.947	436.436	0.83310	0.286	0.332	7462.
480	69.73145	10089.04	166.9	44.770	443.109	0.84730	0.285	0.335	7417.
500	69.39659	9864.86	166.9	49.584	449.845	0.86105	0.284	0.338	7379.
520	69.05564	9675.60	166.0	54.379	456.617	0.87433	0.282	0.339	7347.
540	68.71123	9515.29	164.3	59.150	463.405	0.88713	0.279	0.339	7319.
560	68.36550	9378.89	162.2	63.892	470.190	0.89947	0.277	0.339	7295.
580	68.02008	9262.20	159.7	68.600	476.962	0.91136	0.274	0.338	7274.
600	67.67626	9161.74	157.0	73.274	483.710	0.92279	0.271	0.337	7256.
650	66.82941	8963.98	149.8	84.803	500.440	0.94958	0.265	0.332	7219.
700	66.00699	8819.55	142.6	96.116	516.932	0.97402	0.259	0.327	7190.
750	65.21242	8705.72	135.9	107.235	533.178	0.99644	0.253	0.323	7167.
800	64.44613	8613.62	129.6	118.186	549.194	1.01712	0.249	0.318	7147.
850	63.70712	8535.06	123.9	129.000	565.008	1.03629	0.245	0.314	7129.
900	62.99374	8465.65	118.7	139.704	580.649	1.05418	0.241	0.311	7112.
950	62.30418	8402.76	114.0	150.323	596.149	1.07094	0.239	0.309	7096.
1000	61.63667	8344.72	109.7	160.882	611.536	1.08672	0.237	0.307	7081.
1100	60.36124	8239.61	102.1	181.894	642.070	1.11583	0.234	0.304	7052.
1200	59.15604	8145.99	95.6	202.870	672.421	1.14224	0.232	0.303	7024.
1300	58.01211	8062.14	90.0	223.902	702.712	1.16648	0.231	0.303	6997.
1400	56.92243	7987.22	85.0	245.052	733.028	1.18895	0.231	0.304	6972.
1500	55.88149	7920.76	80.6	266.361	763.427	1.20992	0.232	0.305	6948.

APPENDIX C

ADDITIONAL THERMODYNAMIC PROPERTIES OF NITROGEN IN BRITISH UNITS

(The number of significant figures given in the table is not justified on the basis of the uncertainty of the data, but is presented to maintain internal consistency.)

THEMODYNAMIC PROPERTIES OF SATURATED NITROGEN

TEMPERATURE	DENSITY	V(CH/DV) P	V(CP/DU) V	V(CP/DV) T	(DV/DT) / V P
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
113.666	54.17395 0.04214	195.57 27.93	20.889 2.159	-108020.01 -1.80	0.0023855 0.0090544
114	54.13080 0.04347	195.27 28.00	20.647 2.159	-106773.76 -1.86	0.0023750 0.0090344
116	53.86923 0.05220	193.04 28.44	19.377 2.159	-99703.77 -2.27	0.0024530 0.0089198
118	53.60271 0.06226	190.32 28.87	18.352 2.159	-93265.73 -2.74	0.0025121 0.0088136
120	53.33123 0.07377	187.25 29.30	17.507 2.160	-87388.93 -3.29	0.0025720 0.0087158
122	53.05480 0.08689	183.96 29.71	16.796 2.160	-82011.01 -3.92	0.0026325 0.0086262
124	52.77345 0.10174	180.56 30.11	16.187 2.160	-77076.81 -4.65	0.0026935 0.0085446
126	52.48735 0.11847	177.11 30.51	15.655 2.160	-72537.59 -5.47	0.0027549 0.0084712
128	52.19646 0.13724	173.66 30.89	15.183 2.161	-68350.18 -6.40	0.0028165 0.0084057
130	51.90091 0.15820	170.25 31.26	14.759 2.162	-64476.43 -7.45	0.0028784 0.0083481
132	51.60079 0.18151	166.91 31.61	14.372 2.162	-60882.56 -8.62	0.0029407 0.0082983
134	51.29618 0.20734	163.64 31.96	14.014 2.163	-57538.74 -9.93	0.0030035 0.0082565
136	50.98715 0.23586	160.46 32.29	13.679 2.164	-54418.67 -11.38	0.0030665 0.0082227
138	50.67377 0.26724	157.36 32.60	13.364 2.165	-51499.12 -12.98	0.0031311 0.0081957
139.224	50.47977 0.28795	155.51 32.79	13.178 2.166	-49801.77 -14.03	0.0031709 0.0081849
140	50.35607 0.30167	154.36 32.90	13.063 2.166	-48759.70 -14.73	0.0031963 0.0081789
142	50.03410 0.33935	151.44 33.18	12.776 2.168	-46182.46 -16.66	0.0032627 0.0081692
144	49.70786 0.38046	148.60 33.45	12.498 2.170	-43751.67 -18.75	0.0033307 0.0081678
146	49.37734 0.42521	145.84 33.70	12.229 2.171	-41453.56 -21.03	0.0034006 0.0081750
148	49.04251 0.47382	143.14 33.93	11.967 2.173	-39276.06 -23.49	0.0034726 0.0081909
150	48.70332 0.52649	140.51 34.15	11.712 2.175	-37208.67 -26.14	0.0035472 0.0082157
152	48.35969 0.58347	137.93 34.35	11.462 2.178	-35242.18 -28.98	0.0036246 0.0082499
154	48.01153 0.64499	135.40 34.52	11.217 2.180	-33368.58 -32.03	0.0037052 0.0082937
156	47.65873 0.71131	132.91 34.68	10.977 2.183	-31580.87 -35.28	0.0037896 0.0083477
158	47.30114 0.78268	130.46 34.82	10.741 2.186	-29872.96 -38.74	0.0038780 0.0084123
160	46.93860 0.85938	128.03 34.94	10.508 2.189	-28239.49 -42.39	0.0039709 0.0084881

THERMODYNAMIC PROPERTIES OF SATURATED NITROGEN

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(CP/DV)$	$V(CP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
162	46.57074 0.54165	125.64 35.04	10.230 2.193	-26675.80 -46.26	0.0040688 0.0085757
164	46.19796 1.02994	123.26 35.11	10.054 2.197	-25177.76 -50.32	0.0041723 0.0086760
166	45.81944 1.12445	120.90 35.17	9.832 2.201	-23741.74 -54.58	0.0042819 0.0087397
168	45.43512 1.22555	118.55 35.21	9.613 2.205	-22364.53 -59.03	0.0043982 0.0089180
170	45.04476 1.33364	116.22 35.22	9.397 2.209	-21043.23 -63.66	0.0045219 0.0090619
172	44.64804 1.44910	113.88 35.21	9.183 2.214	-19775.25 -68.46	0.0046538 0.0092229
174	44.24466 1.57238	111.55 35.19	8.973 2.219	-18558.23 -73.42	0.0047948 0.0094026
176	43.83427 1.70394	109.22 35.14	8.764 2.225	-17390.01 -78.52	0.0049460 0.0096027
178	43.41648 1.84430	106.88 35.06	8.558 2.230	-16268.59 -83.74	0.0051084 0.0098255
180	42.99088 1.99403	104.53 34.97	8.355 2.236	-15192.10 -89.07	0.0052835 0.0100736
182	42.55659 2.15377	102.17 34.86	8.153 2.242	-14158.77 -94.46	0.0054729 0.0103499
184	42.11430 2.32415	99.80 34.72	7.953 2.249	-13166.95 -99.90	0.0056786 0.0106582
186	41.66222 2.50610	97.42 34.56	7.755 2.256	-12215.04 -105.34	0.0059027 0.0110027
188	41.20008 2.70036	95.01 34.38	7.558 2.263	-11301.54 -110.75	0.0061483 0.0113837
190	40.72713 2.90796	92.57 34.18	7.363 2.271	-10425.00 -116.08	0.0064187 0.0118227
192	40.24249 3.13004	90.11 33.96	7.169 2.279	-9584.06 -121.26	0.0067182 0.0123126
194	39.74516 3.36789	87.61 33.72	6.975 2.287	-8777.41 -126.24	0.0070521 0.0128682
196	39.23392 3.62302	85.07 33.45	6.782 2.295	-8003.85 -130.94	0.0074271 0.0135019
198	38.70737 3.89716	82.49 33.17	6.588 2.304	-7262.27 -135.27	0.0078520 0.0142293
200	38.16380 4.19236	79.86 32.87	6.395 2.314	-6551.66 -139.13	0.0083391 0.0150712
202	37.60112 4.51107	77.17 32.54	6.200 2.324	-5871.14 -142.40	0.0089004 0.0160542
204	37.01675 4.85622	74.41 32.20	6.004 2.334	-5219.98 -144.95	0.0095592 0.0172145
206	36.40747 5.23140	71.57 31.84	5.806 2.344	-4597.64 -146.60	0.0103428 0.0186019
208	35.76914 5.64108	68.65 31.46	5.605 2.355	-4003.74 -147.17	0.0112918 0.0202866
210	35.09634 6.09096	65.63 31.07	5.400 2.367	-3438.17 -146.41	0.0124666 0.0223714

THERMODYNAMIC PROPERTIES OF SATURATED NITROGEN

TEMPERATURE	DENSITY	$V(CH/DV)_P$	$V(CP/DU)_V$	$V(CP/DV)_T$	$(DV/DT)_P / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
212	34.38175 6.58852	62.50 30.66	5.189 2.379	-2901.10 -144.05	0.0139581 0.0250129
214	33.61536 7.14392	59.23 30.24	4.971 2.391	-2393.07 -139.73	0.0159190 0.0234624
216	32.78231 7.77161	55.80 29.81	4.744 2.404	-1915.07 -133.01	0.0186124 0.0331507
218	31.86000 8.49353	52.19 29.38	4.504 2.418	-1468.78 -123.30	0.0225430 0.0398847
220	30.81063 9.34580	48.34 28.95	4.246 2.432	-1056.88 -109.81	0.0288094 0.0502764
222	29.56298 10.39612	44.18 28.53	3.960 2.447	-683.76 -91.36	0.0403226 0.0690202
224	27.55200 11.80116	39.58 28.15	3.628 2.465	-357.39 -65.99	0.0679793 0.1115698
226	25.36827 14.14072	34.15 27.93	3.187 2.493	-95.80 -29.75	0.2095756 0.3076836
227.160	19.60427	-0.00	2.636	0.00	

THERMODYNAMIC PROPERTIES OF NITROGEN

0.50 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. F	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.669	0.01151	28.14	2.160	-0.50	0.0088665
115	0.01138	28.47	2.160	-0.50	0.0087613
120	0.01090	29.72	2.160	-0.50	0.0083882
125	0.01046	30.96	2.160	-0.50	0.0080462
130	0.01006	32.21	2.160	-0.50	0.0077316
135	0.00968	33.45	2.160	-0.50	0.0074410
140	0.00934	34.70	2.161	-0.50	0.0071718
145	0.00901	35.94	2.161	-0.50	0.0069217
150	0.00871	37.19	2.161	-0.50	0.0066886
155	0.00843	38.43	2.161	-0.50	0.0064708
160	0.00817	39.67	2.161	-0.50	0.0062670
165	0.00792	40.92	2.161	-0.50	0.0060756
170	0.00768	42.16	2.161	-0.50	0.0058957
175	0.00746	43.40	2.161	-0.50	0.0057262
180	0.00726	44.64	2.161	-0.50	0.0055663
185	0.00706	45.89	2.161	-0.50	0.0054150
190	0.00687	47.13	2.161	-0.50	0.0052718
195	0.00670	48.37	2.161	-0.50	0.0051361
200	0.00653	49.61	2.161	-0.50	0.0050071
205	0.00637	50.86	2.161	-0.50	0.0048845
210	0.00622	52.10	2.161	-0.50	0.0047678
215	0.00607	53.34	2.161	-0.50	0.0046566
220	0.00594	54.58	2.161	-0.50	0.0045504
225	0.00580	55.82	2.161	-0.50	0.0044490
230	0.00568	57.07	2.161	-0.50	0.0043520
235	0.00555	58.31	2.161	-0.50	0.0042592
240	0.00544	59.55	2.161	-0.50	0.0041703
245	0.00533	60.79	2.161	-0.50	0.0040850
250	0.00522	62.04	2.161	-0.50	0.0040031
260	0.00502	64.52	2.161	-0.50	0.0038488
270	0.00483	67.00	2.161	-0.50	0.0037060
280	0.00466	69.49	2.161	-0.50	0.0035734
290	0.00450	71.97	2.161	-0.50	0.0034500
300	0.00435	74.45	2.161	-0.50	0.0033349
320	0.00408	79.42	2.161	-0.50	0.0031262
340	0.00384	84.38	2.161	-0.50	0.0029422
360	0.00363	89.35	2.161	-0.50	0.0027786
380	0.00343	94.31	2.161	-0.50	0.0026322
400	0.00326	99.28	2.161	-0.50	0.0025005
420	0.00311	104.24	2.161	-0.50	0.0023814
440	0.00297	109.21	2.161	-0.50	0.0022731
460	0.00284	114.18	2.161	-0.50	0.0021742
480	0.00272	119.15	2.161	-0.50	0.0020836
500	0.00261	124.12	2.160	-0.50	0.0020002
520	0.00251	129.10	2.160	-0.50	0.0019233
540	0.00242	134.09	2.160	-0.50	0.0018520
560	0.00233	139.08	2.159	-0.50	0.0017859
580	0.00225	144.08	2.158	-0.50	0.0017243
600	0.00218	149.09	2.158	-0.50	0.0016668
650	0.00201	161.68	2.154	-0.50	0.0015385
700	0.00186	174.39	2.150	-0.50	0.0014286
750	0.00174	187.23	2.144	-0.50	0.0013334
800	0.00163	200.25	2.136	-0.50	0.0012500
850	0.00154	213.46	2.126	-0.50	0.0011765
900	0.00145	226.88	2.115	-0.50	0.0011111
950	0.00137	240.53	2.102	-0.50	0.0010526
1000	0.00131	254.40	2.088	-0.50	0.0010000
1100	0.00119	282.84	2.058	-0.50	0.0007091
1200	0.00109	312.15	2.025	-0.50	0.0004333
1300	0.00100	342.25	1.972	-0.50	0.0007692
1400	0.00093	373.05	1.959	-0.50	0.0007143
1500	0.00087	404.43	1.928	-0.50	0.0006667
2000	0.00065	566.93	1.893	-0.50	0.0005000
2500	0.00052	733.45	1.722	-0.50	0.0004000
3000	0.00044	900.62	1.671	-0.50	0.0003333
3500	0.00037	1067.39	1.637	-0.50	0.0002857

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

0.10 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV) P	V(OP/DU) V	V(OP/DV) T	(DV/DT) /V P
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/DTU	PSIA	DEG. R
*113.668	0.00210	28.20	2.160	-0.10	0.0089113
115	0.00217	28.54	2.160	-0.10	0.0087087
120	0.00218	29.78	2.160	-0.10	0.0083442
125	0.00209	31.02	2.160	-0.10	0.0080092
130	0.00201	32.26	2.160	-0.10	0.0077001
135	0.00193	33.50	2.160	-0.10	0.0074141
140	0.00187	34.74	2.160	-0.10	0.0071486
145	0.00180	35.99	2.160	-0.10	0.0069016
150	0.00174	37.23	2.160	-0.10	0.0066710
155	0.00168	38.47	2.160	-0.10	0.0064555
160	0.00163	39.71	2.160	-0.10	0.0062534
165	0.00158	40.95	2.160	-0.10	0.0060636
170	0.00154	42.19	2.160	-0.10	0.0058850
175	0.00149	43.44	2.160	-0.10	0.0057167
180	0.00145	44.68	2.161	-0.10	0.0055577
185	0.00141	45.92	2.161	-0.10	0.0054073
190	0.00137	47.16	2.161	-0.10	0.0052649
195	0.00134	48.40	2.161	-0.10	0.0051298
200	0.00131	49.64	2.161	-0.10	0.0050014
205	0.00127	50.88	2.161	-0.10	0.0048793
210	0.00124	52.12	2.161	-0.10	0.0047631
215	0.00121	53.37	2.161	-0.10	0.0046522
220	0.00119	54.61	2.161	-0.10	0.0045464
225	0.00116	55.85	2.161	-0.10	0.0044454
230	0.00113	57.09	2.161	-0.10	0.0043487
235	0.00111	58.33	2.161	-0.10	0.0042561
240	0.00109	59.57	2.161	-0.10	0.0041674
245	0.00107	60.81	2.161	-0.10	0.0040823
250	0.00104	62.05	2.161	-0.10	0.0040006
260	0.00100	64.54	2.161	-0.10	0.0038467
270	0.00097	67.02	2.161	-0.10	0.0037042
280	0.00093	69.50	2.161	-0.10	0.0035718
290	0.00090	71.98	2.161	-0.10	0.0034486
300	0.00087	74.47	2.161	-0.10	0.0033336
320	0.00082	79.43	2.161	-0.10	0.0031252
340	0.00077	84.39	2.161	-0.10	0.0029414
360	0.00073	89.36	2.161	-0.10	0.0027779
380	0.00069	94.32	2.161	-0.10	0.0026317
400	0.00065	99.29	2.161	-0.10	0.0025001
420	0.00062	104.25	2.161	-0.10	0.0023910
440	0.00059	109.22	2.161	-0.10	0.0022728
460	0.00057	114.18	2.161	-0.10	0.0021740
480	0.00054	119.15	2.161	-0.10	0.0020834
500	0.00052	124.13	2.160	-0.10	0.0020000
520	0.00050	129.11	2.160	-0.10	0.0019231
540	0.00048	134.09	2.160	-0.10	0.0018519
560	0.00047	139.08	2.159	-0.10	0.0017857
580	0.00045	144.08	2.158	-0.10	0.0017242
600	0.00044	149.10	2.157	-0.10	0.0016667
650	0.00040	161.69	2.154	-0.10	0.0015335
700	0.00037	174.39	2.150	-0.10	0.0014286
750	0.00035	187.23	2.144	-0.10	0.0013333
800	0.00033	200.25	2.136	-0.10	0.0012500
850	0.00031	213.46	2.126	-0.10	0.0011765
900	0.00029	226.88	2.115	-0.10	0.0011111
950	0.00027	240.53	2.102	-0.10	0.0010526
1000	0.00026	254.40	2.088	-0.10	0.0010000
1100	0.00024	282.83	2.057	-0.10	0.0009091
1200	0.00022	312.15	2.025	-0.10	0.0008333
1300	0.00020	342.25	1.992	-0.10	0.0007692
1400	0.00019	373.05	1.959	-0.10	0.0007143
1500	0.00017	404.43	1.928	-0.10	0.0006667
2000	0.00013	566.92	1.802	-0.10	0.0005000
2500	0.00010	733.44	1.722	-0.10	0.0004000
3000	0.00009	900.62	1.671	-0.10	0.0003333
3500	0.00007	1067.39	1.637	-0.10	0.0002857

* INDICATES TWO PHASE BOUNDARY

1 PSIA 150KAR

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

5 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV) P	V(DP/DU) V	V(DP/DV) T	(DV/DT) / V P
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.681	54.17365	195.63	20.867	-108001.22	0.0023849
115	54.00216	194.29	19.966	-103188.07	0.0024729
120	53.23774	187.28	17.503	-87407.13	0.0025713
*124.636	52.68704	179.47	16.010	-75523.11	0.0027129
*124.636	0.10634	30.24	2.160	-4.90	0.0035704
125	0.10651	30.33	2.160	-4.90	0.0034707
130	0.10219	31.62	2.161	-4.91	0.0081062
135	0.09921	32.89	2.162	-4.92	0.0077595
140	0.09455	34.17	2.162	-4.93	0.0074448
145	0.09116	35.44	2.163	-4.94	0.0071573
150	0.08902	36.71	2.163	-4.94	0.0068933
155	0.08509	37.98	2.163	-4.95	0.0066497
160	0.08235	39.24	2.164	-4.95	0.0064242
165	0.07979	40.50	2.164	-4.96	0.0062145
170	0.07739	41.77	2.164	-4.96	0.0060189
175	0.07513	43.02	2.164	-4.96	0.0058360
180	0.07300	44.28	2.164	-4.97	0.0056645
185	0.07099	45.54	2.164	-4.97	0.0055032
190	0.06909	46.80	2.164	-4.97	0.0053513
195	0.06729	48.05	2.164	-4.97	0.0052079
200	0.06558	49.31	2.164	-4.98	0.0050723
205	0.06396	50.56	2.164	-4.98	0.0049438
210	0.06242	51.81	2.164	-4.98	0.0048218
215	0.06095	53.07	2.164	-4.98	0.0047059
220	0.05955	54.32	2.164	-4.98	0.0045956
225	0.05821	55.57	2.164	-4.98	0.0044905
230	0.05693	56.82	2.164	-4.98	0.0043902
235	0.05571	58.07	2.164	-4.98	0.0042944
240	0.05454	59.32	2.164	-4.99	0.0042028
245	0.05342	60.57	2.164	-4.99	0.0041150
250	0.05234	61.82	2.164	-4.99	0.0040310
260	0.05031	64.32	2.164	-4.99	0.0038729
270	0.04844	66.81	2.164	-4.99	0.0037269
280	0.04670	69.31	2.163	-4.99	0.0035917
290	0.04508	71.80	2.163	-4.99	0.0034660
300	0.04357	74.29	2.163	-4.99	0.0033490
320	0.04034	79.28	2.163	-4.99	0.0031373
340	0.03842	84.26	2.163	-5.00	0.0029510
360	0.03628	89.24	2.163	-5.00	0.0027957
380	0.03437	94.21	2.163	-5.00	0.0026380
400	0.03265	99.19	2.163	-5.00	0.0025053
420	0.03109	104.16	2.163	-5.00	0.0023853
440	0.02967	109.14	2.162	-5.00	0.0022764
460	0.02838	114.12	2.162	-5.00	0.0021770
480	0.02720	119.09	2.162	-5.00	0.0020859
500	0.02611	124.07	2.162	-5.00	0.0020022
520	0.02510	129.06	2.161	-5.00	0.0019249
540	0.02417	134.05	2.161	-5.00	0.0018534
560	0.02331	139.05	2.160	-5.00	0.0017871
580	0.02250	144.05	2.160	-5.00	0.0017253
600	0.02175	149.07	2.159	-5.00	0.0016677
650	0.02098	161.67	2.155	-5.00	0.0015372
700	0.01864	174.38	2.151	-5.00	0.0014291
750	0.01740	187.23	2.144	-5.00	0.0013337
800	0.01631	200.25	2.136	-5.00	0.0012502
850	0.01535	213.47	2.127	-5.00	0.0011766
900	0.01450	226.90	2.115	-5.00	0.0011112
950	0.01374	240.55	2.103	-5.00	0.0010527
1000	0.01305	254.42	2.089	-5.00	0.0010000
1100	0.01136	282.86	2.058	-5.00	0.0007091
1200	0.01008	312.18	2.025	-5.00	0.0008333
1300	0.01004	342.29	1.992	-5.00	0.0007692
1400	0.00932	373.09	1.960	-5.00	0.0007142
1500	0.00870	404.47	1.928	-5.00	0.0006666
2000	0.00653	566.98	1.803	-5.00	0.0005000
2500	0.00522	733.51	1.722	-5.00	0.0004000
3000	0.00435	900.67	1.671	-5.00	0.0003333
3500	0.00373	1067.46	1.637	-5.00	0.0002857

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

10 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT)/V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.635	54.17440	195.72	20.840	-10.8006.97	0.0023837
115	54.00478	194.40	19.951	-103244.68	0.0024212
120	53.73529	187.38	17.491	-87461.97	0.0025695
125	52.63442	178.94	15.903	-74812.33	0.0027221
130	51.90279	170.30	14.755	-64500.76	0.0028774
*133.603	51.35700	164.28	14.093	-58183.90	0.0029910
*133.603	0.20700	31.89	2.163	-9.66	0.0032642
135	0.19970	32.26	2.163	-9.67	0.0031514
140	0.19121	33.57	2.164	-9.71	0.0077767
145	0.18475	34.88	2.165	-9.74	0.0074403
150	0.17814	36.17	2.166	-9.76	0.0071375
155	0.17201	37.47	2.166	-9.79	0.0068616
160	0.16632	38.76	2.167	-9.81	0.0066091
165	0.16101	40.04	2.167	-9.82	0.0063769
170	0.15604	41.33	2.167	-9.84	0.0061623
175	0.15138	42.60	2.167	-9.85	0.0059632
180	0.14700	43.83	2.168	-9.86	0.0057779
185	0.14288	45.15	2.168	-9.87	0.0056047
190	0.13899	46.43	2.168	-9.88	0.0054425
195	0.13531	47.70	2.168	-9.89	0.0052901
200	0.13182	48.96	2.168	-9.90	0.0051466
205	0.12852	50.23	2.168	-9.91	0.0050112
210	0.12538	51.50	2.168	-9.91	0.0048832
215	0.12239	52.76	2.167	-9.92	0.0047619
220	0.11955	54.02	2.167	-9.93	0.0046468
225	0.11693	55.29	2.167	-9.93	0.0045375
230	0.11424	56.55	2.167	-9.93	0.0044334
235	0.11177	57.81	2.167	-9.94	0.0043341
240	0.10940	59.06	2.167	-9.94	0.0042394
245	0.10713	60.32	2.167	-9.95	0.0041489
250	0.10495	61.59	2.167	-9.95	0.0040623
260	0.10085	64.09	2.167	-9.96	0.0038999
270	0.09707	66.60	2.166	-9.96	0.0037503
280	0.09356	69.11	2.166	-9.96	0.0036121
290	0.09030	71.61	2.166	-9.97	0.0034839
300	0.08726	74.12	2.166	-9.97	0.0033647
320	0.08176	79.12	2.166	-9.98	0.0031496
340	0.07692	84.12	2.165	-9.98	0.0029608
360	0.07262	89.11	2.165	-9.99	0.0027936
380	0.06878	94.10	2.165	-9.99	0.0026444
400	0.06533	99.09	2.165	-9.99	0.0025106
420	0.06220	104.03	2.164	-9.99	0.0023897
440	0.05937	109.06	2.164	-9.99	0.0022800
460	0.05678	114.05	2.164	-10.00	0.0021800
480	0.05441	119.03	2.164	-10.00	0.0020885
500	0.05222	124.02	2.163	-10.00	0.0020044
520	0.05021	129.01	2.163	-10.00	0.0019268
540	0.04835	134.01	2.162	-10.00	0.0018550
560	0.04662	139.01	2.162	-10.00	0.0017884
580	0.04501	144.02	2.161	-10.00	0.0017265
600	0.04351	149.04	2.160	-10.00	0.0016637
650	0.04016	161.65	2.156	-10.00	0.0015399
700	0.03729	174.37	2.152	-10.00	0.0014296
750	0.03480	187.23	2.145	-10.00	0.0013340
800	0.03262	200.26	2.137	-10.00	0.0012505
850	0.03070	213.48	2.127	-10.00	0.0011768
900	0.02900	226.91	2.116	-10.00	0.0011113
950	0.02747	240.57	2.103	-10.00	0.0010529
1000	0.02610	254.45	2.099	-10.00	0.0010001
1100	0.02372	282.89	2.059	-10.00	0.0009091
1200	0.02175	312.22	2.026	-10.00	0.0008333
1300	0.02007	342.33	1.993	-10.00	0.0007692
1400	0.01864	373.13	1.960	-10.00	0.0007142
1500	0.01740	404.52	1.929	-10.00	0.0006666
2000	0.01305	567.04	1.803	-10.00	0.0004999
2500	0.01044	733.57	1.722	-10.00	0.0003999
3000	0.00870	900.76	1.671	-10.00	0.0003333
3500	0.00746	1067.53	1.637	-10.00	0.0002857

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

14.696 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.707	54.17510	195.81	20.815	-109012.39	0.0023825
115	54.00774	194.50	19.936	-103297.85	0.0024197
120	53.33915	187.48	17.490	-87513.47	0.0025678
125	52.63773	179.03	15.894	-74862.41	0.0027202
130	51.90557	170.40	14.748	-64549.70	0.0028753
135	51.14556	162.11	13.840	-55989.71	0.0030333
*139.225	50.47376	155.51	13.178	-49801.70	0.0031709
*139.225	0.28795	32.79	2.166	-14.03	0.0031849
140	0.28613	32.99	2.166	-14.05	0.0031700
145	0.27502	34.33	2.167	-14.12	0.00377309
150	0.26483	35.66	2.168	-14.18	0.0033849
155	0.25543	36.99	2.169	-14.23	0.0030745
160	0.24673	38.30	2.170	-14.27	0.0067937
165	0.23864	39.61	2.170	-14.31	0.0065380
170	0.23110	40.91	2.170	-14.34	0.0063039
175	0.22406	42.21	2.171	-14.37	0.0060832
180	0.21745	43.50	2.171	-14.40	0.0058987
185	0.21124	44.79	2.171	-14.42	0.0057036
190	0.20539	46.08	2.171	-14.44	0.0055310
195	0.19997	47.36	2.171	-14.46	0.0053697
200	0.19465	48.64	2.171	-14.48	0.0052194
205	0.18970	49.92	2.171	-14.50	0.0050762
210	0.18501	51.20	2.171	-14.51	0.0049422
215	0.18055	52.47	2.171	-14.52	0.0048157
220	0.17631	53.75	2.171	-14.53	0.0046959
225	0.17227	55.02	2.170	-14.54	0.0045824
230	0.16841	56.29	2.170	-14.55	0.0044746
235	0.16473	57.56	2.170	-14.56	0.0043720
240	0.16121	58.82	2.170	-14.57	0.0042743
245	0.15783	60.09	2.170	-14.58	0.0041812
250	0.15460	61.35	2.170	-14.59	0.0040922
260	0.14853	63.88	2.170	-14.60	0.0039256
270	0.14292	66.40	2.169	-14.61	0.0037725
280	0.13773	68.92	2.169	-14.62	0.0036314
290	0.13291	71.44	2.169	-14.63	0.0035009
300	0.12841	73.95	2.168	-14.63	0.0033796
320	0.12029	78.97	2.168	-14.65	0.0031613
340	0.11314	83.99	2.168	-14.66	0.0029700
360	0.10680	89.00	2.167	-14.66	0.0028010
380	0.10114	94.00	2.167	-14.67	0.0026505
400	0.09605	99.00	2.166	-14.68	0.0025155
420	0.09145	103.99	2.166	-14.68	0.0023938
440	0.08727	108.99	2.166	-14.68	0.0022835
460	0.08346	113.98	2.165	-14.69	0.0021829
480	0.07997	118.97	2.165	-14.69	0.0020909
500	0.07676	123.97	2.165	-14.69	0.0020064
520	0.07380	128.96	2.164	-14.69	0.0019286
540	0.07106	133.97	2.164	-14.69	0.0018565
560	0.06851	138.97	2.163	-14.69	0.0017897
580	0.06615	143.99	2.162	-14.70	0.0017276
600	0.06394	149.02	2.161	-14.70	0.0016696
650	0.05901	161.64	2.157	-14.70	0.0015405
700	0.05479	174.36	2.153	-14.70	0.0014300
750	0.05114	187.23	2.146	-14.70	0.0013343
800	0.04794	200.27	2.138	-14.70	0.0012507
850	0.04512	213.49	2.128	-14.70	0.0011769
900	0.04261	226.93	2.117	-14.70	0.0011114
950	0.04037	240.58	2.104	-14.70	0.0010528
1000	0.03835	254.47	2.079	-14.70	0.0010001
1100	0.03486	282.97	2.059	-14.70	0.0009091
1200	0.03196	312.25	2.026	-14.70	0.0008333
1300	0.02950	342.37	1.993	-14.70	0.0007691
1400	0.02739	373.19	1.960	-14.70	0.0007142
1500	0.02557	404.57	1.929	-14.70	0.0006665
2000	0.01918	567.10	1.803	-14.70	0.0004999
2500	0.01534	733.64	1.723	-14.70	0.0003999
3000	0.01278	900.93	1.671	-14.70	0.0003333
3500	0.01096	1067.60	1.637	-14.70	0.0002857

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

15 PSIA (5.068 BAR)

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DH)	V(OP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.708	54.17515	195.81	20.813	-108012.74	0.0023324
115	54.00739	194.50	19.935	-103301.29	0.0024196
120	53.33834	187.49	17.479	-87516.81	0.0025677
125	52.63724	179.04	15.893	-74865.65	0.0027201
130	51.90692	170.40	14.748	-64552.87	0.0028751
135	51.14583	162.12	13.839	-55992.83	0.0030331
*139.538	50.42995	155.05	13.132	-49377.59	0.0031811
*139.538	0.29344	32.93	2.166	-14.31	0.0031923
140	0.29233	32.96	2.166	-14.32	0.0031434
145	0.28095	34.30	2.169	-14.39	0.0077505
150	0.27051	35.63	2.169	-14.46	0.0074016
155	0.26049	36.95	2.169	-14.51	0.0070987
160	0.25109	38.27	2.170	-14.56	0.0068060
165	0.24372	39.58	2.170	-14.60	0.0065487
170	0.23601	40.88	2.171	-14.63	0.0063132
175	0.22880	42.18	2.171	-14.66	0.0060764
180	0.22204	43.48	2.171	-14.69	0.0058961
185	0.21569	44.77	2.171	-14.72	0.0057101
190	0.20971	46.06	2.171	-14.74	0.0055368
195	0.20407	47.34	2.171	-14.76	0.0053749
200	0.19874	48.62	2.171	-14.77	0.0052231
205	0.19368	49.90	2.171	-14.79	0.0050305
210	0.18889	51.18	2.171	-14.81	0.0049461
215	0.18433	52.46	2.171	-14.82	0.0048192
220	0.18000	53.73	2.171	-14.83	0.0046991
225	0.17537	55.00	2.171	-14.84	0.0045853
230	0.17193	56.27	2.171	-14.85	0.0044773
235	0.16817	57.54	2.170	-14.86	0.0043745
240	0.16457	58.81	2.170	-14.87	0.0042766
245	0.16113	60.07	2.170	-14.88	0.0041833
250	0.15783	61.34	2.170	-14.89	0.0040941
255	0.15462	63.87	2.170	-14.90	0.0039272
260	0.15160	66.39	2.169	-14.91	0.0037740
270	0.14060	68.91	2.169	-14.92	0.0036327
280	0.13567	71.43	2.169	-14.93	0.0035020
300	0.13108	73.94	2.169	-14.94	0.0033806
320	0.12279	78.96	2.168	-14.95	0.0031620
340	0.11549	83.98	2.168	-14.96	0.0029706
360	0.10901	88.99	2.167	-14.97	0.0028015
380	0.10323	93.99	2.167	-14.97	0.0026509
400	0.09804	98.99	2.167	-14.98	0.0025159
420	0.09334	103.99	2.166	-14.98	0.0023941
440	0.08908	108.98	2.166	-14.99	0.0022837
460	0.08519	113.98	2.166	-14.99	0.0021831
480	0.08162	118.97	2.165	-14.99	0.0020911
500	0.07835	123.96	2.165	-14.99	0.0020066
520	0.07532	128.96	2.164	-15.00	0.0019287
540	0.07253	133.96	2.164	-15.00	0.0018566
560	0.06993	138.97	2.163	-15.00	0.0017898
580	0.06751	143.99	2.162	-15.00	0.0017277
600	0.06526	149.01	2.161	-15.00	0.0016697
650	0.06023	161.64	2.159	-15.00	0.0015406
700	0.05592	174.36	2.153	-15.00	0.0014300
750	0.05219	187.23	2.146	-15.00	0.0013344
800	0.04893	200.27	2.139	-15.01	0.0012507
850	0.04605	213.49	2.128	-15.01	0.0011770
900	0.04349	226.93	2.117	-15.01	0.0011114
950	0.04120	240.59	2.104	-15.01	0.0010528
1000	0.03914	254.47	2.090	-15.01	0.0010001
1100	0.03558	282.92	2.059	-15.01	0.0009091
1200	0.03262	312.25	2.026	-15.01	0.0008333
1300	0.03011	342.37	1.993	-15.01	0.0007691
1400	0.02796	373.18	1.960	-15.01	0.0007141
1500	0.02609	404.57	1.929	-15.01	0.0006665
2000	0.01957	567.10	1.803	-15.00	0.0004999
2500	0.01566	733.44	1.723	-15.00	0.0003999
3000	0.01305	900.83	1.671	-15.00	0.0003333
3500	0.01119	1067.60	1.637	-15.00	0.0002857

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

20 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DV)	V(DP/DV)	(DV/DV) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.722	54.17599	195.91	20.746	-108019.55	0.0023912
115	54.01001	194.61	19.920	-103357.90	0.0024179
120	53.34178	187.59	17.467	-87571.65	0.0025658
125	52.64146	179.14	15.834	-74918.06	0.0027181
130	51.91383	170.50	14.740	-64604.07	0.0028729
135	51.15040	162.22	13.833	-56044.04	0.0030306
140	50.36076	154.45	13.059	-48805.70	0.0031937
*144.108	49.69015	148.45	12.493	-43624.51	0.0033345
*144.108	0.38278	33.46	2.170	-19.87	0.0031680
145	0.38001	33.71	2.170	-19.89	0.0030905
150	0.36532	35.08	2.171	-19.01	0.0026983
155	0.35186	36.43	2.172	-19.11	0.0023330
160	0.33947	37.78	2.173	-19.20	0.0020160
165	0.32800	39.11	2.174	-19.27	0.0017303
170	0.31736	40.44	2.174	-19.34	0.0014721
175	0.30744	41.76	2.174	-19.39	0.0012360
180	0.29816	43.07	2.175	-19.44	0.0010194
185	0.28947	44.38	2.175	-19.49	0.0008196
190	0.28130	45.68	2.175	-19.53	0.0006346
195	0.27360	46.98	2.175	-19.56	0.0004625
200	0.26634	48.28	2.175	-19.60	0.0003019
205	0.25947	49.57	2.175	-19.63	0.0001516
210	0.25296	50.86	2.175	-19.65	0.0000105
215	0.24679	52.15	2.174	-19.68	0.00048777
220	0.24092	53.44	2.174	-19.70	0.00047525
225	0.23533	54.72	2.174	-19.72	0.00046341
230	0.23000	56.00	2.174	-19.74	0.00045219
235	0.22492	57.28	2.174	-19.75	0.00044155
240	0.22007	58.55	2.174	-19.77	0.00043144
245	0.21542	59.83	2.173	-19.78	0.00042181
250	0.21098	61.10	2.173	-19.80	0.00041263
260	0.20262	63.64	2.173	-19.82	0.00039549
270	0.19492	66.19	2.172	-19.84	0.00037979
280	0.18780	68.71	2.172	-19.86	0.00036535
290	0.18118	71.24	2.172	-19.87	0.00035201
300	0.17502	73.77	2.171	-19.89	0.00033965
320	0.16390	78.81	2.171	-19.91	0.00031745
340	0.15412	83.84	2.170	-19.93	0.00029305
360	0.14546	88.86	2.170	-19.94	0.00028095
380	0.13772	93.88	2.169	-19.95	0.00026574
400	0.13078	98.89	2.169	-19.96	0.00025212
420	0.12450	103.90	2.168	-19.97	0.00023985
440	0.11890	108.90	2.168	-19.98	0.00022373
460	0.11361	113.91	2.167	-19.98	0.00021862
480	0.10885	118.91	2.167	-19.99	0.00020937
500	0.10448	123.91	2.166	-19.99	0.00020088
520	0.10044	128.91	2.166	-19.99	0.00019305
540	0.09671	133.92	2.165	-20.00	0.00018582
560	0.09324	138.93	2.164	-20.00	0.00017912
580	0.09002	143.96	2.163	-20.00	0.00017288
600	0.08701	148.99	2.162	-20.00	0.00016707
650	0.08030	161.62	2.159	-20.00	0.00015413
700	0.07456	174.36	2.154	-20.01	0.00014305
750	0.06958	187.23	2.147	-20.01	0.00013347
800	0.06523	200.27	2.139	-20.01	0.00012509
850	0.06139	213.50	2.129	-20.01	0.00011771
900	0.05798	226.94	2.117	-20.01	0.00011115
950	0.05493	240.61	2.105	-20.01	0.00010529
1000	0.05218	254.49	2.090	-20.01	0.00010001
1100	0.04744	282.95	2.060	-20.01	0.00009091
1200	0.04348	312.29	2.027	-20.01	0.00008332
1300	0.04014	342.41	1.993	-20.01	0.00007691
1400	0.03727	373.22	1.961	-20.01	0.00007141
1500	0.03479	404.62	1.929	-20.01	0.00006665
2000	0.02609	567.16	1.893	-20.01	0.00004998
2500	0.02098	733.71	1.773	-20.01	0.00003999
3000	0.01740	900.90	1.671	-20.01	0.00003332
3500	0.01491	1067.68	1.637	-20.01	0.00002856

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

25 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DU)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*113.736	54.17664	196.00	20.759	-108024.39	0.0023800
115	54.01262	194.71	19.904	-103414.52	0.0024163
120	53.34443	187.70	17.455	-87626.49	0.0025640
125	52.64407	179.24	15.874	-74972.28	0.0027161
130	51.91485	170.61	14.732	-64457.07	0.0028706
135	51.15496	162.32	13.827	-56095.25	0.0030281
140	50.36592	154.55	13.054	-48856.33	0.0031909
145	49.54766	147.29	12.360	-42625.97	0.0033629
*147.880	49.06279	143.30	11.983	-39403.92	0.0034682
*147.880	0.47078	33.92	2.173	-23.33	0.0081896
150	0.46277	34.51	2.174	-23.41	0.0030008
155	0.44508	35.00	2.175	-23.58	0.0075966
160	0.42988	37.28	2.176	-23.72	0.0072407
165	0.41396	38.64	2.177	-23.84	0.0069241
170	0.40017	39.99	2.177	-23.94	0.0066399
175	0.38735	41.33	2.178	-24.04	0.0063926
180	0.37541	42.66	2.178	-24.12	0.0061482
185	0.36424	43.99	2.178	-24.19	0.0059336
190	0.35377	45.31	2.178	-24.26	0.0057359
195	0.34393	46.63	2.178	-24.31	0.0055530
200	0.33466	47.94	2.178	-24.36	0.0053831
205	0.32590	49.24	2.178	-24.41	0.0052247
210	0.31761	50.55	2.178	-24.45	0.0050766
215	0.30976	51.85	2.178	-24.49	0.0049377
220	0.30231	53.14	2.178	-24.53	0.0048070
225	0.29522	54.43	2.177	-24.56	0.0046838
230	0.28847	55.72	2.177	-24.59	0.0045674
235	0.28204	57.01	2.177	-24.61	0.0044573
240	0.27589	58.30	2.177	-24.64	0.0043527
245	0.27002	59.58	2.177	-24.66	0.0042534
250	0.26440	60.86	2.176	-24.68	0.0041589
260	0.25396	63.42	2.176	-24.72	0.0039328
270	0.24415	65.97	2.175	-24.75	0.0038220
280	0.23517	68.52	2.175	-24.78	0.0036744
290	0.22684	71.06	2.174	-24.80	0.0035384
300	0.21909	73.59	2.174	-24.82	0.0034126
320	0.20511	78.66	2.173	-24.86	0.0031870
340	0.19283	83.70	2.172	-24.89	0.0029905
360	0.18196	88.74	2.172	-24.91	0.0028174
380	0.17226	93.77	2.171	-24.93	0.0026638
400	0.16355	98.79	2.170	-24.94	0.0025265
420	0.15569	103.81	2.170	-24.95	0.0024029
440	0.14855	108.83	2.169	-24.96	0.0022710
460	0.14204	113.84	2.169	-24.97	0.0021892
480	0.13609	118.85	2.169	-24.98	0.0020962
500	0.13061	123.85	2.168	-24.98	0.0020109
520	0.12556	128.86	2.167	-24.99	0.0019324
540	0.12089	133.88	2.166	-24.99	0.0018599
560	0.11656	138.90	2.165	-25.00	0.0017925
580	0.11252	143.92	2.164	-25.00	0.0017300
600	0.10876	148.96	2.163	-25.00	0.0016717
650	0.10037	161.60	2.160	-25.01	0.0015420
700	0.09319	174.35	2.155	-25.01	0.0014310
750	0.08697	187.23	2.148	-25.01	0.0013350
800	0.08153	200.28	2.140	-25.02	0.0012512
850	0.07673	213.51	2.130	-25.02	0.0011773
900	0.07246	226.96	2.118	-25.02	0.0011116
950	0.06865	240.63	2.105	-25.02	0.0010529
1000	0.06521	254.52	2.091	-25.02	0.0010002
1100	0.05929	282.98	2.050	-25.02	0.0009091
1200	0.05435	312.32	2.027	-25.02	0.0008332
1300	0.05017	342.45	1.994	-25.02	0.0007690
1400	0.04658	373.27	1.961	-25.02	0.0007141
1500	0.04348	404.66	1.930	-25.02	0.0006664
2000	0.03261	567.22	1.804	-25.01	0.0004999
2500	0.02609	733.78	1.723	-25.01	0.0003998
3000	0.02175	900.97	1.671	-25.01	0.0003332
3500	0.01864	1067.75	1.637	-25.01	0.0002856

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

30 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/RTU	V(DP/DV) PSIA	(DV/DT) /V DEC. R
*113.749	54.17739	196.09	20.733	-108030.26	0.0023788
115	54.01523	194.82	19.888	-103471.14	0.0024146
120	53.36747	187.80	17.443	-87691.33	0.0025622
125	52.64848	179.35	15.965	-75025.59	0.0027140
130	51.91996	170.71	14.725	-64709.16	0.0029684
135	51.15952	162.42	13.821	-56146.45	0.0030257
140	50.37107	154.65	13.050	-48906.94	0.0031881
145	49.55247	147.39	12.356	-42676.25	0.0033597
150	48.70568	140.54	11.711	-37226.78	0.0035458
*151.121	48.51134	139.06	11.571	-36094.96	0.0035902
*151.121	0.55747	34.26	2.177	-27.71	0.0082337
155	0.54071	35.36	2.178	-27.90	0.0078921
160	0.52035	36.77	2.179	-28.11	0.0074818
165	0.50169	38.16	2.180	-28.30	0.0071299
170	0.48451	39.53	2.181	-28.46	0.0068171
175	0.46861	40.90	2.181	-28.59	0.0065366
180	0.45393	42.25	2.182	-28.71	0.0062830
185	0.44005	43.60	2.182	-28.82	0.0060522
190	0.42716	44.94	2.182	-28.92	0.0058409
195	0.41507	46.27	2.182	-29.00	0.0056465
200	0.40270	47.59	2.182	-29.08	0.0054667
205	0.39298	48.91	2.182	-29.14	0.0052999
210	0.38286	50.23	2.182	-29.21	0.0051444
215	0.37327	51.54	2.181	-29.26	0.0049990
220	0.36418	52.85	2.181	-29.31	0.0048627
225	0.35555	54.15	2.181	-29.36	0.0047346
230	0.34734	55.45	2.181	-29.40	0.0046138
235	0.33951	56.75	2.180	-29.44	0.0044997
240	0.33205	58.04	2.180	-29.48	0.0043917
245	0.32492	59.34	2.180	-29.51	0.0042893
250	0.31811	60.63	2.179	-29.54	0.0041920
260	0.30533	63.20	2.179	-29.59	0.0040111
270	0.29257	65.76	2.178	-29.64	0.0038464
280	0.28271	68.32	2.178	-29.68	0.0036955
290	0.27264	70.87	2.177	-29.71	0.0035568
300	0.26329	73.42	2.177	-29.74	0.0034287
320	0.24641	78.50	2.176	-29.80	0.0031996
340	0.23151	83.57	2.175	-29.84	0.0030004
360	0.21851	88.62	2.174	-29.87	0.0028254
380	0.20633	93.66	2.173	-29.89	0.0026703
400	0.19635	98.70	2.172	-29.91	0.0025318
420	0.18870	103.73	2.172	-29.93	0.0024072
440	0.17831	108.75	2.171	-29.95	0.0022946
460	0.17049	113.77	2.170	-29.96	0.0021923
480	0.16333	118.78	2.170	-29.97	0.0020988
500	0.15676	123.80	2.169	-29.98	0.0020131
520	0.15069	128.82	2.168	-29.98	0.0019342
540	0.14508	133.84	2.168	-29.99	0.0018614
560	0.13987	138.86	2.167	-29.99	0.0017939
580	0.13503	143.89	2.166	-30.00	0.0017312
600	0.13051	148.93	2.165	-30.00	0.0016727
650	0.12044	161.59	2.161	-30.01	0.0015427
700	0.11182	174.34	2.156	-30.02	0.0014315
750	0.10435	187.23	2.149	-30.02	0.0013354
800	0.09782	200.23	2.140	-30.02	0.0012514
850	0.09206	213.53	2.130	-30.02	0.0011774
900	0.08694	226.98	2.119	-30.03	0.0011117
950	0.08237	240.65	2.106	-30.03	0.0010530
1000	0.07825	254.54	2.092	-30.03	0.0010002
1100	0.07113	283.02	2.061	-30.03	0.0009091
1200	0.06521	312.36	2.028	-30.03	0.0008332
1300	0.06019	342.49	1.994	-30.03	0.0007690
1400	0.05589	373.31	1.961	-30.02	0.0007140
1500	0.05217	404.71	1.930	-30.02	0.0006664
2000	0.03913	567.28	1.804	-30.02	0.0004997
2500	0.03131	733.84	1.723	-30.02	0.0003998
3000	0.02609	901.05	1.672	-30.01	0.0003332
3500	0.02237	1067.83	1.637	-30.01	0.0002856

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

35 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DU/DV)$	$V(DP/DU)$	$V(DP/DV)$	$(DV/DT)/V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.763	54.17814	196.18	20.706	-108036.16	0.0023775
115	54.01734	194.92	19.873	-103527.75	0.0024130
120	53.35051	187.91	17.432	-87736.17	0.0025603
125	52.65199	179.45	15.855	-75078.90	0.0027120
130	51.92287	170.81	14.717	-64761.25	0.0029662
135	51.16407	162.52	13.815	-56197.65	0.0030232
140	50.37672	154.75	13.045	-48957.54	0.0031853
145	49.55927	147.49	12.353	-42726.51	0.0033565
150	48.71222	140.65	11.709	-37276.90	0.0035421
*153.980	48.01526	135.42	11.220	-33387.00	0.0037044
*153.980	0.64435	34.52	2.130	-32.00	0.0032933
155	0.63896	34.82	2.181	-32.07	0.0031925
160	0.61402	36.26	2.132	-32.38	0.0077412
165	0.59130	37.69	2.183	-32.64	0.0073494
170	0.57047	39.08	2.194	-32.86	0.0070049
175	0.55126	40.47	2.185	-33.06	0.0066987
180	0.53348	41.84	2.185	-33.23	0.0064241
185	0.51534	43.21	2.195	-33.38	0.0061759
190	0.50151	44.56	2.185	-33.51	0.0059501
195	0.48706	45.91	2.185	-33.63	0.0057433
200	0.47350	47.25	2.185	-33.73	0.0055531
205	0.46074	48.58	2.185	-33.83	0.0053772
210	0.44871	49.91	2.185	-33.91	0.0052139
215	0.43733	51.24	2.185	-33.99	0.0050618
220	0.42655	52.56	2.185	-34.06	0.0049196
225	0.41623	53.87	2.184	-34.12	0.0047863
230	0.40661	55.18	2.194	-34.18	0.0046610
235	0.39736	56.49	2.194	-34.23	0.0045428
240	0.38845	57.79	2.183	-34.28	0.0044313
245	0.38014	59.09	2.183	-34.33	0.0043256
250	0.37210	60.39	2.183	-34.37	0.0042255
260	0.35734	62.98	2.192	-34.44	0.0040397
270	0.34320	65.56	2.181	-34.51	0.0038710
280	0.33042	68.13	2.191	-34.56	0.0037168
290	0.31860	70.69	2.190	-34.61	0.0035754
300	0.30761	73.25	2.179	-34.65	0.0034450
320	0.28781	78.35	2.178	-34.72	0.0032123
340	0.27046	83.43	2.177	-34.78	0.0030104
360	0.25512	88.50	2.176	-34.82	0.0028334
380	0.24145	93.55	2.175	-34.85	0.0026768
400	0.22919	98.60	2.174	-34.88	0.0025371
420	0.21813	103.64	2.174	-34.91	0.0024116
440	0.20810	108.67	2.173	-34.93	0.0022983
460	0.19896	113.70	2.172	-34.94	0.0021953
480	0.19059	118.72	2.171	-34.96	0.0021014
500	0.18291	123.75	2.171	-34.97	0.0020153
520	0.17582	128.77	2.170	-34.98	0.0019361
540	0.16927	133.80	2.169	-34.99	0.0018630
560	0.16319	138.83	2.168	-34.99	0.0017952
580	0.15753	143.86	2.167	-35.00	0.0017323
600	0.15226	148.91	2.166	-35.00	0.0016737
650	0.14351	161.57	2.162	-35.01	0.0015434
700	0.13044	174.33	2.157	-35.02	0.0014320
750	0.12173	187.23	2.150	-35.03	0.0013357
800	0.11411	200.29	2.141	-35.03	0.0012516
850	0.10739	213.54	2.131	-35.03	0.0011776
900	0.10142	226.99	2.119	-35.03	0.0011118
950	0.09608	240.67	2.106	-35.04	0.0010531
1000	0.09127	254.57	2.092	-35.04	0.0010002
1100	0.08298	283.05	2.061	-35.04	0.0009090
1200	0.07606	312.79	2.029	-35.04	0.0008331
1300	0.07021	342.53	1.995	-35.03	0.0007690
1400	0.06520	373.36	1.962	-35.03	0.0007140
1500	0.06085	404.76	1.930	-35.03	0.0006663
2000	0.04565	567.34	1.804	-35.03	0.0004997
2500	0.03652	733.91	1.723	-35.02	0.0003998
3000	0.03044	901.12	1.672	-35.02	0.0003332
3500	0.02609	1067.90	1.638	-35.02	0.0002856

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

40 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DV)	V(DP/DV)	(DV/DV) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*113.777	54.17889	196.27	20.679	-109042.09	0.0023763
115	54.02045	195.03	19.858	-103584.37	0.0024113
120	53.75355	188.01	17.470	-87791.01	0.0025585
125	52.65549	179.55	15.846	-75132.21	0.0027100
130	51.92688	170.91	14.709	-64813.74	0.0028639
135	51.16867	162.82	13.809	-56248.84	0.0030207
140	50.38136	154.85	13.040	-49008.13	0.0031825
145	49.56507	147.60	12.349	-42776.76	0.0033534
150	48.71375	140.75	11.706	-37327.01	0.0035385
155	47.84025	134.21	11.095	-32495.20	0.0037443
*156.550	47.56091	132.23	10.912	-31103.67	0.0039134
*156.550	0.73041	34.72	2.184	-36.21	0.0083644
160	0.71006	35.74	2.195	-36.49	0.0080214
165	0.68791	37.19	2.186	-36.85	0.0075843
170	0.65914	38.62	2.187	-37.16	0.0072042
175	0.63539	40.03	2.189	-37.42	0.0068497
180	0.61441	41.43	2.188	-37.65	0.0065721
185	0.59495	42.81	2.189	-37.85	0.0063050
190	0.57694	44.19	2.189	-38.03	0.0060534
195	0.55993	45.55	2.189	-38.19	0.0058435
200	0.54408	46.91	2.189	-38.33	0.0056421
205	0.52919	48.26	2.189	-38.46	0.0054567
210	0.51518	49.60	2.189	-38.57	0.0052853
215	0.50194	50.93	2.188	-38.67	0.0051261
220	0.48942	52.26	2.188	-38.76	0.0049778
225	0.47756	53.59	2.189	-38.85	0.0048391
230	0.46630	54.91	2.187	-38.93	0.0047090
235	0.45559	56.22	2.187	-39.00	0.0045867
240	0.44535	57.54	2.187	-39.06	0.0044714
245	0.43556	58.85	2.186	-39.12	0.0043625
250	0.42637	60.15	2.186	-39.18	0.0042594
260	0.40899	62.76	2.185	-39.27	0.0040686
270	0.39302	65.35	2.184	-39.36	0.0038958
280	0.37831	67.93	2.183	-39.43	0.0037383
290	0.36470	70.51	2.183	-39.49	0.0035941
300	0.35206	73.09	2.182	-39.55	0.0034613
320	0.32931	78.20	2.181	-39.64	0.0032250
340	0.30939	83.29	2.179	-39.71	0.0030205
360	0.29178	88.38	2.178	-39.76	0.0028415
380	0.27611	93.45	2.177	-39.81	0.0026833
400	0.26206	98.50	2.176	-39.85	0.0025424
420	0.24938	103.55	2.175	-39.88	0.0024160
440	0.23790	108.59	2.175	-39.90	0.0023019
460	0.22743	113.63	2.174	-39.92	0.0021984
480	0.21786	118.66	2.173	-39.94	0.0021040
500	0.20906	123.69	2.172	-39.96	0.0020175
520	0.20096	128.72	2.171	-39.97	0.0019380
540	0.19346	133.75	2.170	-39.98	0.0018646
560	0.18651	138.79	2.169	-39.99	0.0017966
580	0.18004	143.83	2.168	-40.00	0.0017335
600	0.17401	148.88	2.167	-40.01	0.0016747
650	0.16057	161.55	2.163	-40.02	0.0015441
700	0.14907	174.32	2.158	-40.03	0.0014325
750	0.13910	187.23	2.151	-40.04	0.0013361
800	0.13040	200.29	2.142	-40.04	0.0012519
850	0.12272	213.55	2.132	-40.04	0.0011777
900	0.11589	227.01	2.120	-40.04	0.0011119
950	0.10979	240.69	2.107	-40.05	0.0010531
1000	0.10430	254.59	2.093	-40.05	0.0010003
1100	0.09482	287.08	2.062	-40.05	0.0009090
1200	0.08692	312.43	2.029	-40.05	0.0008331
1300	0.08023	342.57	1.995	-40.05	0.0007689
1400	0.07450	373.40	1.962	-40.04	0.0007139
1500	0.06954	404.81	1.931	-40.04	0.0006663
2000	0.05216	567.40	1.804	-40.03	0.0004997
2500	0.04174	733.99	1.723	-40.03	0.0003997
3000	0.03479	901.19	1.672	-40.02	0.0003331
3500	0.02982	1067.97	1.638	-40.02	0.0002856

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

45 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DH)$	$V(DP/DH)$	$V(DH/DH)$	$(DH/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.790	54.17365	196.37	20.653	-109048.04	0.0023751
115	54.02306	195.13	19.842	-103640.99	0.0024097
120	53.35659	188.12	17.408	-87845.85	0.0025567
125	52.65839	179.66	15.836	-75185.52	0.0027090
130	51.93089	171.01	14.702	-64885.47	0.0028617
135	51.17317	162.72	13.803	-56300.02	0.0030182
140	50.38650	154.95	13.036	-49058.72	0.0031797
145	49.57086	147.70	12.346	-42827.00	0.0033502
150	48.72527	140.86	11.704	-37377.10	0.0035348
155	47.84760	134.32	11.095	-32545.28	0.0037399
*158.892	47.14009	129.37	10.637	-29135.65	0.0039188
*158.892	0.81620	34.87	2.188	-40.34	0.0084447
160	0.80865	35.21	2.188	-40.46	0.0083251
165	0.77656	36.69	2.199	-40.93	0.0078363
170	0.74762	38.15	2.191	-41.34	0.0074163
175	0.72108	39.59	2.191	-41.69	0.0070503
180	0.69668	41.01	2.192	-41.99	0.0067274
185	0.67412	42.42	2.192	-42.25	0.0064398
190	0.65319	43.81	2.192	-42.48	0.0061813
195	0.63369	45.19	2.192	-42.69	0.0059473
200	0.61546	46.56	2.192	-42.87	0.0057341
205	0.59936	47.93	2.192	-43.03	0.0055387
210	0.58228	49.29	2.192	-43.18	0.0053586
215	0.56713	50.63	2.192	-43.31	0.0051920
220	0.55291	51.97	2.191	-43.43	0.0050373
225	0.53926	53.31	2.191	-43.54	0.0048930
230	0.52640	54.64	2.191	-43.63	0.0047580
235	0.51419	55.96	2.190	-43.72	0.0046314
240	0.50257	57.28	2.190	-43.81	0.0045123
245	0.49150	58.60	2.189	-43.88	0.0044000
250	0.48093	59.92	2.189	-43.95	0.0042939
260	0.46118	62.54	2.188	-44.08	0.0040979
270	0.44306	65.14	2.187	-44.18	0.0039209
280	0.42637	67.74	2.186	-44.27	0.0037600
290	0.41095	70.33	2.186	-44.35	0.0036129
300	0.39664	72.90	2.185	-44.42	0.0034778
320	0.37090	78.04	2.183	-44.54	0.0032377
340	0.34838	83.16	2.182	-44.63	0.0030305
360	0.32850	88.26	2.181	-44.70	0.0028495
380	0.31091	93.34	2.179	-44.76	0.0026898
400	0.29495	98.41	2.178	-44.81	0.0025477
420	0.28067	103.47	2.177	-44.85	0.0024204
440	0.26771	108.52	2.176	-44.88	0.0023056
460	0.25592	113.56	2.175	-44.90	0.0022015
480	0.24513	118.60	2.175	-44.93	0.0021066
500	0.23523	123.64	2.174	-44.95	0.0020197
520	0.22610	128.67	2.173	-44.96	0.0019398
540	0.21766	133.71	2.172	-44.98	0.0018661
560	0.20993	138.75	2.171	-44.99	0.0017980
580	0.20255	143.80	2.169	-45.00	0.0017347
600	0.19576	148.85	2.168	-45.01	0.0016757
650	0.18063	161.54	2.164	-45.02	0.0015447
700	0.16768	174.32	2.158	-45.04	0.0014330
750	0.15648	187.23	2.152	-45.04	0.0013364
800	0.14668	200.30	2.143	-45.05	0.0012521
850	0.13804	213.56	2.133	-45.05	0.0011779
900	0.13036	227.02	2.121	-45.06	0.0011120
950	0.12349	240.71	2.109	-45.06	0.0010532
1000	0.11732	254.61	2.093	-45.06	0.0010003
1100	0.10665	283.11	2.062	-45.06	0.0009090
1200	0.09777	312.47	2.029	-45.06	0.0008331
1300	0.09025	342.61	1.995	-45.06	0.0007689
1400	0.08390	373.44	1.963	-45.06	0.0007139
1500	0.07822	404.86	1.931	-45.05	0.0006662
2000	0.05868	567.46	1.804	-45.04	0.0004996
2500	0.04695	734.04	1.724	-45.04	0.0003997
3000	0.03913	901.26	1.672	-45.03	0.0003331
3500	0.03354	1068.05	1.638	-45.03	0.0002855

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

50 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.804	54.18040	196.46	20.627	-108054.03	0.0023739
115	54.02566	195.74	19.827	-103697.62	0.0024089
120	53.35967	188.22	17.396	-87900.70	0.0025549
125	52.66249	179.76	15.827	-75238.83	0.0027060
130	51.93489	171.11	14.634	-64917.50	0.0028595
135	51.17771	162.82	13.797	-56351.19	0.0030157
140	50.39163	155.05	13.031	-49109.29	0.0031770
145	49.57664	147.80	12.342	-42877.23	0.0033470
150	48.73179	140.96	11.702	-37427.18	0.0035311
155	47.85635	134.43	11.093	-32595.35	0.0037156
160	46.94272	128.09	10.508	-28264.37	0.0039083
*161.049	46.74637	126.77	10.388	-27410.72	0.0040216
*161.049	0.90124	34.99	2.191	-44.39	0.0085325
165	0.87270	36.19	2.192	-44.87	0.0081076
170	0.83903	37.69	2.194	-45.40	0.0076425
175	0.80940	39.15	2.195	-45.84	0.0072414
180	0.78035	40.59	2.195	-46.23	0.0068908
185	0.75452	42.02	2.196	-46.56	0.0065808
190	0.73061	43.43	2.196	-46.86	0.0063041
195	0.70839	44.83	2.196	-47.12	0.0060550
200	0.68766	46.22	2.196	-47.35	0.0058291
205	0.66825	47.60	2.196	-47.55	0.0056230
210	0.65004	48.96	2.195	-47.73	0.0054339
215	0.63289	50.32	2.195	-47.90	0.0052596
220	0.61672	51.68	2.195	-48.05	0.0050981
225	0.60143	53.02	2.194	-48.18	0.0049480
230	0.58694	54.37	2.194	-48.31	0.0048079
235	0.57319	55.70	2.194	-48.42	0.0046768
240	0.56011	57.03	2.193	-48.52	0.0045538
245	0.54766	58.36	2.193	-48.62	0.0044330
250	0.53579	59.69	2.192	-48.70	0.0043287
260	0.51362	62.32	2.191	-48.86	0.0041275
270	0.49331	64.94	2.190	-48.99	0.0039462
280	0.47461	67.55	2.189	-49.10	0.0037819
290	0.45735	70.14	2.188	-49.20	0.0036319
300	0.44134	72.72	2.187	-49.29	0.0034944
320	0.41258	77.89	2.186	-49.43	0.0032506
340	0.38745	83.02	2.184	-49.54	0.0030406
360	0.36527	88.14	2.183	-49.63	0.0028576
380	0.34555	93.23	2.181	-49.70	0.0026963
400	0.32788	98.31	2.180	-49.76	0.0025531
420	0.31197	103.38	2.179	-49.81	0.0024248
440	0.29755	108.44	2.178	-49.85	0.0023093
460	0.28442	113.49	2.177	-49.88	0.0022045
480	0.27242	118.54	2.176	-49.91	0.0021091
500	0.26140	123.59	2.175	-49.93	0.0020218
520	0.25124	128.63	2.174	-49.95	0.0019417
540	0.24195	133.67	2.173	-49.97	0.0018677
560	0.23315	138.72	2.172	-49.99	0.0017993
580	0.22505	143.77	2.171	-50.00	0.0017358
600	0.21750	148.83	2.169	-50.01	0.0016767
650	0.20069	161.52	2.165	-50.03	0.0015454
700	0.18630	174.31	2.159	-50.04	0.0014334
750	0.17384	187.23	2.152	-50.06	0.0013267
800	0.16295	200.31	2.144	-50.06	0.0012523
850	0.15335	213.57	2.133	-50.07	0.0011781
900	0.14432	227.04	2.122	-50.07	0.0011121
950	0.13720	240.73	2.108	-50.07	0.0010533
1000	0.13033	254.64	2.094	-50.07	0.0010003
1100	0.11848	283.14	2.063	-50.07	0.0009070
1200	0.10861	312.50	2.030	-50.07	0.0008331
1300	0.10026	342.65	1.996	-50.07	0.0007688
1400	0.09310	373.49	1.963	-50.07	0.0007138
1500	0.08670	404.90	1.931	-50.07	0.0006662
2000	0.06519	567.42	1.805	-50.05	0.0004996
2500	0.05216	734.11	1.724	-50.05	0.0003797
3000	0.04347	901.33	1.672	-50.04	0.0003331
3500	0.03727	1068.12	1.638	-50.03	0.0002855

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

60 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(PH/DV)$	$V(PD/DU)$	$V(PD/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.831	54.19121	196.64	20.574	-108066.10	0.0023715
115	54.03037	195.45	19.796	-103810.87	0.0024047
120	53.36569	188.43	17.372	-88010.38	0.0025512
125	52.66949	179.96	15.808	-75345.44	0.0027020
130	51.94288	171.31	14.679	-65071.65	0.0028551
135	51.18679	163.02	13.785	-56453.52	0.0030108
140	50.40188	155.26	13.022	-49210.41	0.0031714
145	49.58919	148.00	12.336	-42977.65	0.0033407
150	48.74479	141.17	11.697	-37527.29	0.0035238
155	47.86961	134.65	11.071	-32695.43	0.0037271
160	46.95931	128.32	10.508	-28364.61	0.0039581
*164.928	46.02295	122.16	9.951	-24503.62	0.0042224
*164.928	1.07301	35.14	2.198	-52.27	0.0087270
165	1.07235	35.17	2.198	-52.28	0.0087180
170	1.02813	36.72	2.200	-53.11	0.0081436
175	0.98933	38.25	2.201	-53.81	0.0076595
180	0.95221	39.75	2.202	-54.41	0.0072445
185	0.91918	41.22	2.203	-54.92	0.0068334
190	0.88890	42.67	2.203	-55.37	0.0065855
195	0.86072	44.11	2.203	-55.76	0.0062928
200	0.83464	45.53	2.203	-56.11	0.0060291
205	0.81033	46.93	2.203	-56.41	0.0057997
210	0.78758	48.33	2.202	-56.69	0.0055910
215	0.76624	49.72	2.202	-56.93	0.0053999
220	0.74616	51.09	2.202	-57.16	0.0052241
225	0.72722	52.46	2.201	-57.36	0.0050616
230	0.70932	53.83	2.201	-57.54	0.0049107
235	0.69236	55.19	2.200	-57.70	0.0047702
240	0.67627	56.53	2.200	-57.86	0.0046388
245	0.66097	57.87	2.199	-57.99	0.0045157
250	0.64640	59.21	2.199	-58.12	0.0043999
260	0.61925	61.88	2.197	-58.35	0.0041878
270	0.59442	64.53	2.196	-58.54	0.0039977
280	0.57163	67.16	2.195	-58.71	0.0038261
290	0.55061	69.78	2.194	-58.85	0.0036702
300	0.53115	72.39	2.193	-58.97	0.0035278
320	0.49624	77.59	2.191	-59.18	0.0032764
340	0.46579	82.76	2.189	-59.34	0.0030609
360	0.43897	87.90	2.197	-59.47	0.0029738
380	0.41515	93.02	2.186	-59.57	0.0027094
400	0.39394	98.12	2.184	-59.66	0.0025638
420	0.37465	103.21	2.183	-59.73	0.0024336
440	0.35728	108.29	2.182	-59.78	0.0023166
460	0.34147	113.36	2.180	-59.83	0.0022106
480	0.32702	118.42	2.179	-59.87	0.0021143
500	0.31376	123.48	2.178	-59.91	0.0020262
520	0.30155	128.53	2.177	-59.94	0.0019454
540	0.29026	133.59	2.176	-59.96	0.0018709
560	0.27979	138.65	2.174	-59.98	0.0018020
580	0.27006	143.71	2.173	-60.00	0.0017381
600	0.26099	148.78	2.172	-60.01	0.0016787
650	0.24080	161.49	2.167	-60.04	0.0015468
700	0.22352	174.29	2.161	-60.07	0.0014344
750	0.20857	187.23	2.154	-60.08	0.0013374
800	0.19550	200.32	2.145	-60.09	0.0012528
850	0.18398	213.59	2.135	-60.10	0.0011784
900	0.17374	227.07	2.123	-60.10	0.0011123
950	0.16459	240.77	2.110	-60.10	0.0010534
1000	0.15636	254.69	2.095	-60.11	0.0010004
1100	0.14214	283.20	2.064	-60.11	0.0007090
1200	0.13030	312.57	2.030	-60.10	0.0008330
1300	0.12028	342.73	1.997	-60.10	0.0007689
1400	0.11169	373.58	1.964	-60.10	0.0007137
1500	0.10425	405.00	1.932	-60.10	0.0006661
2000	0.07821	567.64	1.805	-60.08	0.0004995
2500	0.06258	734.24	1.724	-60.07	0.0003976
3000	0.05216	901.47	1.672	-60.06	0.0003330
3500	0.04472	1068.27	1.638	-60.05	0.0002855

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

70 PSIA ISOBAR

TEMPERATURE DEG. F	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/8TU	V(DP/DV) T	(DV/DT) /V DEG. R
*113.858	54.18342	196.83	20.522	-108078.28	0.0023690
115	54.03607	195.66	19.765	-103924.12	0.0024014
120	53.37175	188.64	17.349	-88120.07	0.0025476
125	52.67648	180.17	15.799	-75452.04	0.0026779
130	51.95086	171.52	14.664	-65125.78	0.0028506
135	51.19585	163.22	13.773	-56555.83	0.0030059
140	50.41212	155.46	13.012	-49311.49	0.0031659
145	49.59972	148.21	12.329	-43078.01	0.0033344
150	48.75776	141.38	11.693	-37627.24	0.0035166
155	47.88423	134.87	11.089	-32795.44	0.0037186
160	46.97593	128.55	10.508	-28464.76	0.0039477
165	46.02782	122.32	9.944	-24550.66	0.0042141
*168.360	45.36523	118.13	9.574	-22122.35	0.0044199
*168.360	1.24451	35.21	2.206	-59.85	0.0039427
170	1.22661	35.74	2.206	-60.23	0.0037235
175	1.17605	37.33	2.208	-61.27	0.0031341
180	1.13061	38.89	2.209	-62.15	0.0026396
185	1.08942	40.41	2.209	-62.90	0.0022171
190	1.05179	41.90	2.210	-63.54	0.0018507
195	1.01721	43.38	2.210	-64.11	0.0015290
200	0.98525	44.83	2.210	-64.60	0.0012435
205	0.95559	46.27	2.210	-65.04	0.0009379
210	0.92795	47.70	2.209	-65.43	0.0005752
215	0.90210	49.11	2.209	-65.77	0.0005547
220	0.87785	50.51	2.209	-66.08	0.0005351
225	0.85503	51.90	2.208	-66.36	0.00051801
230	0.83351	53.29	2.207	-66.62	0.00050176
235	0.81317	54.66	2.207	-66.85	0.00048669
240	0.79390	56.03	2.206	-67.06	0.00047267
245	0.77562	57.39	2.206	-67.25	0.00045958
250	0.75823	58.75	2.205	-67.43	0.00044732
260	0.72589	61.44	2.203	-67.74	0.00042495
270	0.69640	64.12	2.202	-68.00	0.00040502
280	0.66936	66.78	2.201	-68.23	0.00038712
290	0.64448	69.42	2.199	-68.43	0.00037092
300	0.62147	72.06	2.198	-68.60	0.00035617
320	0.58029	77.29	2.196	-68.88	0.00033024
340	0.54443	82.49	2.194	-69.11	0.00030314
360	0.51290	87.66	2.192	-69.28	0.00028900
380	0.48402	92.81	2.190	-69.42	0.00027226
400	0.45992	97.93	2.188	-69.54	0.00025745
420	0.43742	103.04	2.186	-69.63	0.00024424
440	0.41707	108.14	2.185	-69.71	0.00023239
460	0.39856	113.23	2.184	-69.77	0.00022167
480	0.38166	118.30	2.182	-69.83	0.00021194
500	0.36615	123.37	2.181	-69.87	0.00020305
520	0.35187	128.44	2.180	-69.91	0.00019490
540	0.33867	133.51	2.178	-69.95	0.00018740
560	0.32644	138.58	2.177	-69.97	0.00018047
580	0.31507	143.65	2.176	-70.00	0.00017404
600	0.30448	148.72	2.174	-70.02	0.00016807
650	0.28089	161.46	2.169	-70.06	0.00015482
700	0.26072	174.28	2.163	-70.09	0.00014353
750	0.24327	187.23	2.156	-70.11	0.00013381
800	0.22802	200.33	2.147	-70.12	0.00012533
850	0.21458	213.62	2.136	-70.13	0.00011787
900	0.20264	227.11	2.124	-70.14	0.00011125
950	0.19197	240.81	2.111	-70.14	0.00010535
1000	0.18236	254.74	2.096	-70.14	0.00010004
1100	0.16578	283.26	2.065	-70.14	0.00009030
1200	0.15177	312.65	2.031	-70.14	0.00008329
1300	0.14029	342.81	1.998	-70.14	0.00007687
1400	0.13027	373.67	1.964	-70.13	0.00007136
1500	0.12160	405.09	1.933	-70.13	0.00006660
2000	0.07123	567.76	1.826	-70.11	0.00004994
2500	0.07300	734.38	1.724	-70.09	0.00003976
3000	0.06095	901.62	1.673	-70.08	0.00003330
3500	0.05216	1068.42	1.638	-70.06	0.00002955

* INDICATES TWO PHASE BOUNDARY

40 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*113.886	54.18494	197.01	20.470	-108090.58	0.0023666
115	54.04127	195.87	19.735	-104037.39	0.0023982
120	53.37780	188.85	17.325	-89229.75	0.0025440
125	52.68145	180.38	15.770	-75558.63	0.0026740
130	51.95884	171.72	14.649	-65229.89	0.0028462
135	51.20499	163.47	13.761	-56658.10	0.0030010
140	50.42233	155.66	13.033	-49412.53	0.0031604
145	49.61122	148.41	12.372	-43178.33	0.0033282
150	48.77071	141.59	11.698	-37727.32	0.0035094
155	47.89881	135.08	11.096	-32895.37	0.0037101
160	46.99731	128.77	10.507	-28564.83	0.0039378
165	46.04653	122.56	9.946	-24651.00	0.0042018
170	45.05506	116.34	9.399	-21091.75	0.0045145
*171.453	44.75728	114.52	9.242	-20117.17	0.0046168
*171.453	1.41674	35.22	2.213	-67.13	0.0091771
175	1.37260	36.39	2.214	-68.16	0.0036785
180	1.31633	38.01	2.215	-69.40	0.0039846
185	1.26580	39.58	2.216	-70.46	0.0075374
190	1.22000	41.13	2.217	-71.35	0.0071633
195	1.17818	42.64	2.217	-72.13	0.0067961
200	1.13976	44.13	2.217	-72.81	0.0064741
205	1.10426	45.61	2.217	-73.41	0.0061888
210	1.07130	47.06	2.216	-73.93	0.0059336
215	1.04059	48.50	2.216	-74.40	0.0057035
220	1.01198	49.93	2.215	-74.82	0.0054947
225	0.98493	51.35	2.215	-75.20	0.0053039
230	0.95958	52.75	2.214	-75.54	0.0051288
235	0.93567	54.15	2.213	-75.85	0.0049673
240	0.91306	55.53	2.213	-76.13	0.0048176
245	0.89164	56.91	2.212	-76.39	0.0046784
250	0.87132	58.29	2.211	-76.62	0.0045485
260	0.83357	61.01	2.210	-77.03	0.0043127
270	0.79924	63.72	2.208	-77.38	0.0041038
280	0.76783	66.40	2.207	-77.69	0.0039171
290	0.73997	69.07	2.205	-77.95	0.0037487
300	0.71233	71.72	2.204	-78.17	0.0035760
320	0.66473	77.00	2.201	-78.54	0.0033288
340	0.62336	82.23	2.198	-78.83	0.0031019
360	0.58704	87.42	2.196	-79.06	0.0029064
380	0.55485	92.60	2.194	-79.25	0.0027357
400	0.52612	97.74	2.192	-79.40	0.0025852
420	0.50029	102.88	2.190	-79.52	0.0024513
440	0.47694	107.99	2.189	-79.62	0.0023312
460	0.45571	113.09	2.187	-79.71	0.0022228
480	0.43633	118.19	2.186	-79.78	0.0021245
500	0.41856	123.27	2.184	-79.84	0.0020349
520	0.40220	128.35	2.183	-79.89	0.0019527
540	0.38709	133.43	2.181	-79.93	0.0018771
560	0.37310	138.51	2.180	-79.97	0.0018074
580	0.36009	143.59	2.178	-80.00	0.0017427
600	0.34796	148.67	2.176	-80.03	0.0016827
650	0.32098	161.43	2.171	-80.08	0.0015496
700	0.29792	174.27	2.165	-80.12	0.0014363
750	0.27796	187.23	2.158	-80.14	0.0013387
800	0.26053	200.34	2.149	-80.16	0.0012537
850	0.24517	213.64	2.138	-80.17	0.0011790
900	0.23153	227.14	2.126	-80.18	0.0011127
950	0.21933	240.85	2.112	-80.19	0.0010536
1000	0.20835	254.78	2.098	-80.19	0.0010005
1100	0.18741	283.32	2.066	-80.19	0.0009090
1200	0.17363	312.72	2.032	-80.19	0.0008329
1300	0.16028	342.90	1.998	-80.18	0.0007686
1400	0.14884	373.75	1.965	-80.18	0.0007136
1500	0.13893	405.19	1.933	-80.17	0.0006659
2000	0.10424	567.88	1.806	-80.14	0.0004993
2500	0.08341	734.51	1.725	-80.12	0.0003995
3000	0.06953	901.76	1.673	-80.10	0.0003329
3500	0.05761	1068.57	1.638	-80.08	0.0002854

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

90 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/BTU	V(DP/DV) PSIA	(DV/DT) /V DEG. R
*113.913	54.18646	197.20	20.419	-108103.00	0.0023642
115	54.04646	196.09	19.704	-104150.66	0.0023949
120	53.38395	189.06	17.302	-98339.44	0.0025404
125	52.69042	180.58	15.752	-75665.22	0.0026900
130	51.97690	171.72	14.634	-65337.99	0.0028418
135	51.21392	163.62	13.749	-56760.36	0.0029961
140	50.43753	155.96	12.994	-49513.54	0.0031549
145	49.62770	148.61	12.315	-43273.60	0.0033220
150	48.78362	141.80	11.684	-37827.24	0.0035022
155	47.91335	135.30	11.094	-32995.22	0.0037017
160	47.00374	129.00	10.507	-28664.81	0.0039278
165	46.06518	122.80	9.948	-24751.23	0.0041896
170	45.07637	116.60	9.402	-21192.35	0.0044993
*174.276	44.18360	111.23	8.944	-18393.99	0.0048151
*174.276	1.59004	35.18	2.220	-74.11	0.0094289
175	1.57930	35.43	2.220	-74.39	0.0093109
180	1.51028	37.12	2.222	-76.12	0.0095905
185	1.44398	38.75	2.223	-77.55	0.0098011
190	1.39392	40.34	2.223	-78.77	0.0075077
195	1.34401	41.90	2.224	-79.81	0.0070371
200	1.29843	43.43	2.224	-80.72	0.0067229
205	1.25653	44.94	2.224	-81.50	0.0064037
210	1.21781	46.43	2.223	-82.20	0.0061210
215	1.18187	47.90	2.223	-82.82	0.0058681
220	1.14836	49.35	2.222	-83.36	0.0056403
225	1.11701	50.79	2.222	-83.86	0.0054335
230	1.08760	52.21	2.221	-84.30	0.0052448
235	1.05991	53.63	2.220	-84.70	0.0050715
240	1.03379	55.04	2.219	-85.06	0.0049117
245	1.00909	56.44	2.218	-85.39	0.0047637
250	0.98568	57.82	2.218	-85.70	0.0046261
260	0.94232	60.58	2.216	-86.23	0.0043775
270	0.90297	63.31	2.214	-86.68	0.0041586
280	0.86705	66.02	2.212	-87.06	0.0039637
290	0.83409	68.72	2.211	-87.39	0.0037889
300	0.80373	71.39	2.209	-87.68	0.0036308
320	0.74955	76.70	2.206	-88.16	0.0033553
340	0.70258	81.96	2.203	-88.52	0.0031227
360	0.66140	87.19	2.200	-88.82	0.0029228
380	0.62495	92.39	2.198	-89.05	0.0027489
400	0.59244	97.56	2.196	-89.24	0.0025959
420	0.56325	102.71	2.194	-89.39	0.0024601
440	0.52697	107.84	2.192	-89.52	0.0023385
460	0.51291	112.96	2.190	-89.63	0.0022289
480	0.49104	118.07	2.189	-89.72	0.0021297
500	0.47100	123.17	2.187	-89.80	0.0020392
520	0.45256	128.26	2.185	-89.86	0.0019564
540	0.43553	133.35	2.184	-89.91	0.0018803
560	0.41975	138.44	2.182	-89.96	0.0018100
580	0.40510	143.53	2.181	-90.00	0.0017450
600	0.39144	148.62	2.179	-90.04	0.0016846
650	0.36106	161.40	2.174	-90.10	0.0015509
700	0.33509	174.25	2.167	-90.15	0.0014372
750	0.31264	187.23	2.159	-90.18	0.0013394
800	0.29303	200.36	2.150	-90.20	0.0012542
850	0.27574	213.66	2.139	-90.22	0.0011793
900	0.26039	227.17	2.127	-90.23	0.0011129
950	0.24667	240.89	2.114	-90.23	0.0010537
1000	0.23433	254.83	2.099	-90.24	0.0010006
1100	0.21302	283.38	2.067	-90.24	0.0009090
1200	0.19528	312.79	2.033	-90.24	0.0008328
1300	0.18027	342.98	1.999	-90.23	0.0007685
1400	0.16740	373.84	1.966	-90.22	0.0007135
1500	0.15626	405.29	1.934	-90.22	0.0006658
2000	0.11724	568.00	1.806	-90.18	0.0004992
2500	0.07332	734.65	1.725	-90.15	0.0003394
3000	0.07821	901.90	1.673	-90.12	0.0003329
3500	0.06705	1068.72	1.639	-90.11	0.0002854

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

100 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(OP/DV) PSIA-CU FT/BTU	V(OP/DV) PSIA	(DV/DT) /V P DEG. R
*113.940	54.18799	197.39	20.367	-108115.54	0.0023617
115	54.05165	196.29	19.674	-104263.93	0.0023916
120	53.38689	189.27	17.278	-88449.13	0.0025367
125	52.69738	180.79	15.733	-75771.81	0.0026360
130	51.97474	172.12	14.619	-65438.07	0.0028174
135	51.22794	163.82	13.737	-56862.58	0.0029913
140	50.44270	156.06	12.985	-49614.51	0.0031495
145	49.62415	148.82	12.309	-43378.82	0.0033158
150	48.79650	142.01	11.679	-37927.11	0.0034951
155	47.92786	135.51	11.091	-33095.01	0.0036933
160	47.02511	129.22	10.506	-28764.70	0.0039178
165	46.08376	123.03	9.949	-24851.36	0.0041774
170	45.09760	116.95	9.406	-21292.84	0.0044842
175	44.05822	110.59	8.872	-18041.86	0.0048551
*176.882	43.65099	109.19	8.673	-16899.67	0.0050161
*176.882	1.76471	35.11	2.227	-80.61	0.0076980
180	1.71359	36.20	2.228	-82.21	0.0091719
185	1.63976	37.00	2.229	-84.14	0.0094672
190	1.57413	38.55	2.230	-85.75	0.0078997
195	1.51513	41.15	2.231	-87.12	0.0074056
200	1.46160	42.73	2.231	-88.30	0.0069724
205	1.41267	44.27	2.230	-89.32	0.0066365
210	1.36768	45.79	2.230	-90.21	0.0063206
215	1.32607	47.29	2.230	-91.00	0.0060424
220	1.29742	48.77	2.229	-91.70	0.0057936
225	1.25138	50.23	2.228	-92.33	0.0055592
230	1.21764	51.68	2.228	-92.89	0.0053557
235	1.18597	53.12	2.227	-93.40	0.0051798
240	1.15614	54.54	2.226	-93.86	0.0050091
245	1.12900	55.96	2.225	-94.27	0.0048518
250	1.10137	57.37	2.224	-94.65	0.0047060
260	1.05215	60.15	2.222	-95.32	0.0044440
270	1.00760	62.91	2.220	-95.88	0.0042145
280	0.96701	65.65	2.218	-96.36	0.0040113
290	0.92995	68.37	2.216	-96.78	0.0038296
300	0.89566	71.06	2.214	-97.14	0.0036660
320	0.83478	76.41	2.211	-97.72	0.0033821
340	0.78209	81.71	2.208	-98.18	0.0031435
360	0.73598	86.96	2.205	-98.54	0.0029393
380	0.69521	92.18	2.202	-98.83	0.0027622
400	0.65990	97.39	2.200	-99.06	0.0026067
420	0.62630	102.55	2.199	-99.26	0.0024689
440	0.59688	107.70	2.196	-99.41	0.0023458
460	0.57016	112.83	2.194	-99.55	0.0022350
480	0.54579	117.95	2.192	-99.66	0.0021348
500	0.52347	123.07	2.190	-99.75	0.0020435
520	0.50293	128.17	2.189	-99.83	0.0019600
540	0.48397	133.27	2.187	-99.90	0.0018834
560	0.46641	138.37	2.185	-99.95	0.0018127
580	0.45010	143.47	2.183	-100.00	0.0017473
600	0.43491	148.58	2.181	-100.05	0.0016866
650	0.40112	161.37	2.176	-100.13	0.0015523
700	0.37226	174.24	2.169	-100.18	0.0014382
750	0.34730	187.23	2.161	-100.22	0.0013400
800	0.32550	200.37	2.152	-100.25	0.0012546
850	0.30630	213.49	2.141	-100.27	0.0011796
900	0.28974	227.21	2.129	-100.28	0.0011131
950	0.27400	240.93	2.115	-100.29	0.0010539
1000	0.26029	254.88	2.100	-100.29	0.0010006
1100	0.23662	283.45	2.068	-100.30	0.0009089
1200	0.21691	312.86	2.034	-100.29	0.0008328
1300	0.20024	343.06	2.000	-100.28	0.0007684
1400	0.18595	373.93	1.967	-100.28	0.0007134
1500	0.17357	405.38	1.935	-100.27	0.0006657
2000	0.13024	568.12	1.807	-100.22	0.0004992
2500	0.10423	734.78	1.725	-100.18	0.0003794
3000	0.08488	902.05	1.673	-100.15	0.0003328
3500	0.07449	1068.96	1.639	-100.13	0.0002953

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

150 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*114.076	54.19566	198.31	20.114	-108190.00	0.0023496
115	54.07750	197.35	19.524	-104830.42	0.0023754
120	53.41009	190.32	17.163	-88097.60	0.0025188
125	52.73204	181.82	15.641	-76304.63	0.0026663
130	52.01431	173.14	14.535	-65958.27	0.0028157
135	51.26730	164.83	13.678	-57373.33	0.0029672
140	50.49330	157.06	12.939	-50118.80	0.0031225
145	49.69107	149.93	12.275	-43877.20	0.0032853
150	48.86045	143.04	11.657	-38425.52	0.0034599
155	47.99978	136.59	11.070	-33592.85	0.0036523
160	47.10622	130.35	10.505	-29262.88	0.0038690
165	46.17565	124.22	9.957	-25350.50	0.0041183
170	45.20239	118.12	9.423	-21793.48	0.0044110
175	44.17891	111.95	8.899	-18544.75	0.0047621
180	43.09447	105.63	8.382	-15566.55	0.0051941
185	41.93453	99.06	7.867	-12876.05	0.0057438
*187.661	41.27920	95.42	7.592	-11453.83	0.0051050
*187.661	2.66650	34.42	2.262	-109.84	0.0111201
190	2.59877	35.35	2.263	-112.29	0.0106918
195	2.47048	37.27	2.264	-116.74	0.0096094
200	2.35971	39.10	2.265	-120.36	0.0087742
205	2.26232	40.86	2.265	-123.37	0.0081061
210	2.17554	42.57	2.265	-125.92	0.0075567
215	2.09736	44.23	2.264	-128.11	0.0070952
220	2.02631	45.86	2.263	-130.00	0.0067006
225	1.96126	47.46	2.262	-131.66	0.0063585
230	1.90135	49.03	2.261	-133.13	0.0060581
235	1.84597	50.58	2.260	-134.43	0.0057918
240	1.79427	52.11	2.259	-135.59	0.0055535
245	1.74608	53.62	2.257	-136.63	0.0053338
250	1.70093	55.11	2.256	-137.57	0.0051438
260	1.61849	58.06	2.253	-139.20	0.0048026
270	1.54489	60.96	2.250	-140.56	0.0045126
280	1.47862	63.82	2.247	-141.71	0.0042622
290	1.41851	66.65	2.245	-142.68	0.0040430
300	1.36365	69.45	2.242	-143.52	0.0038491
320	1.26692	74.09	2.237	-144.88	0.0035201
340	1.18409	80.44	2.232	-145.93	0.0032499
360	1.11216	85.93	2.227	-146.75	0.0030230
380	1.04899	91.18	2.223	-147.40	0.0028290
400	0.99300	96.48	2.220	-147.93	0.0026608
420	0.94295	101.75	2.216	-148.36	0.0025132
440	0.89773	106.99	2.213	-148.72	0.0023823
460	0.85717	112.20	2.210	-149.01	0.0022654
480	0.82007	117.39	2.208	-149.26	0.0021602
500	0.78616	122.57	2.205	-149.47	0.0020650
520	0.75502	127.74	2.203	-149.64	0.0019782
540	0.72631	132.90	2.200	-149.79	0.0018988
560	0.69976	138.05	2.198	-149.92	0.0018259
580	0.67513	143.19	2.195	-150.03	0.0017536
600	0.65221	148.34	2.193	-150.12	0.0016763
650	0.60129	161.23	2.186	-150.30	0.0015590
700	0.55786	174.19	2.179	-150.43	0.0014428
750	0.52036	187.24	2.170	-150.51	0.0013432
800	0.48764	200.44	2.160	-150.57	0.0012568
850	0.45892	213.81	2.148	-150.61	0.0011911
900	0.43325	227.39	2.135	-150.64	0.0011141
950	0.41040	241.15	2.121	-150.66	0.0010544
1000	0.38936	255.13	2.106	-150.67	0.0010009
1100	0.35441	283.76	2.073	-150.67	0.0009088
1200	0.32499	313.23	2.039	-150.66	0.0008325
1300	0.29993	343.47	2.004	-150.64	0.0007680
1400	0.27354	374.38	1.970	-150.62	0.0007129
1500	0.26001	405.86	1.938	-150.60	0.0006652
2000	0.19515	568.72	1.809	-150.49	0.0004987
2500	0.15620	735.45	1.727	-150.41	0.0003990
3000	0.13022	902.75	1.675	-150.35	0.0003326
3500	0.11166	1069.60	1.640	-150.30	0.0002852

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

200 PSIA ISOTHERM

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) ATU/LB	V(OP/DU) PSIA-CU FT/BTU	V(OP/DV) PSIA	(DV/DT) /V DEG. R
*114.212	54.20343	199.24	19.869	-109247.36	0.0023376
115	54.10323	198.41	19.377	-105197.09	0.0023594
120	53.44992	191.37	17.050	-89546.11	0.0025011
125	52.76649	182.85	15.551	-76837.32	0.0026468
130	52.05360	174.15	14.473	-66478.10	0.0027943
135	51.31230	165.87	13.621	-57893.46	0.0029435
140	50.54345	158.06	12.895	-50622.71	0.0030961
145	49.74740	150.94	12.243	-44378.41	0.0032554
150	48.92366	144.08	11.636	-38922.48	0.0034257
155	48.07075	137.66	11.058	-34088.93	0.0036124
160	47.18510	131.46	10.503	-29759.99	0.0038218
165	46.26593	125.39	9.964	-25847.21	0.0040614
170	45.30505	119.37	9.439	-22291.26	0.0043411
175	44.29651	113.29	8.925	-19044.20	0.0046742
180	43.23091	107.09	8.418	-16069.73	0.0050301
185	42.09515	100.67	7.915	-13332.93	0.0055201
190	40.86991	93.92	7.408	-10807.01	0.0062591
195	39.52446	86.64	6.899	-8460.67	0.0071998
*196.090	39.21053	84.96	6.773	-7969.75	0.0074451
*196.090	3.63495	33.44	2.236	-131.14	0.0135324
200	3.45989	35.19	2.297	-138.65	0.0119495
205	3.27081	37.29	2.298	-146.27	0.0104953
210	3.11229	39.24	2.298	-152.36	0.0094270
215	2.97537	41.12	2.298	-157.35	0.0086022
220	2.85497	42.93	2.297	-161.54	0.0079423
225	2.74766	44.69	2.296	-165.10	0.0073998
230	2.65096	46.40	2.295	-168.17	0.0069441
235	2.56305	48.07	2.294	-170.84	0.0065546
240	2.48255	49.71	2.292	-173.19	0.0062170
245	2.40839	51.32	2.290	-175.28	0.0059209
250	2.33970	52.91	2.289	-177.13	0.0056594
255	2.21610	56.03	2.285	-180.30	0.0052123
270	2.10752	59.07	2.281	-182.89	0.0048457
280	2.01102	62.06	2.277	-185.05	0.0045375
290	1.92440	65.01	2.273	-186.87	0.0042738
300	1.84605	67.91	2.269	-188.42	0.0040447
320	1.70934	73.62	2.262	-190.92	0.0036646
340	1.59355	79.23	2.256	-192.81	0.0033599
360	1.49385	84.76	2.250	-194.78	0.0031036
380	1.40586	90.22	2.244	-195.45	0.0028968
400	1.33014	95.63	2.239	-196.39	0.0027153
420	1.26187	100.99	2.235	-197.15	0.0025575
440	1.20054	106.31	2.231	-197.78	0.0024188
460	1.14538	111.60	2.227	-198.30	0.0022957
480	1.09521	116.86	2.223	-198.74	0.0021855
500	1.04943	122.11	2.220	-199.10	0.0020862
520	1.00746	127.33	2.217	-199.41	0.0019962
540	0.96894	132.54	2.214	-199.67	0.0019141
560	0.93316	137.74	2.211	-199.89	0.0018389
580	0.90010	142.93	2.208	-200.08	0.0017697
600	0.86936	148.12	2.205	-200.25	0.0017059
650	0.80118	161.11	2.197	-200.56	0.0015655
700	0.74311	174.14	2.189	-200.78	0.0014473
750	0.69302	187.27	2.179	-200.93	0.0013464
800	0.64936	200.53	2.168	-201.03	0.0012589
850	0.61093	213.95	2.156	-201.10	0.0011825
900	0.57695	227.55	2.142	-201.15	0.0011150
950	0.54641	241.36	2.129	-201.18	0.0010549
1000	0.51904	255.29	2.112	-201.19	0.0010011
1100	0.47184	284.07	2.079	-201.19	0.0009087
1200	0.43256	313.59	2.043	-201.17	0.0008321
1300	0.39934	343.89	2.008	-201.14	0.0007676
1400	0.37098	374.83	1.974	-201.11	0.0007124
1500	0.34622	406.35	1.942	-201.07	0.0006647
2000	0.25991	569.32	1.811	-200.88	0.0004983
2500	0.20808	736.13	1.729	-200.73	0.0003987
3000	0.17350	903.48	1.676	-200.62	0.0003324
3500	0.14978	1070.35	1.641	-200.53	0.0002950

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

250 PSIA ISOPAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	RTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*114.348	54.21129	200.18	19.631	-108317.59	0.0023257
115	54.12834	199.48	19.232	-105963.94	0.0023435
120	53.47968	192.43	16.939	-90094.68	0.0024836
125	52.90072	183.99	15.462	-77369.69	0.0026276
130	52.09262	175.17	14.491	-66997.58	0.0027732
135	51.35635	166.83	13.564	-58393.01	0.0029202
140	50.59315	159.06	12.851	-51124.77	0.0030702
145	49.80317	151.65	12.211	-44876.48	0.0032262
150	49.98615	145.11	11.614	-39418.03	0.0033723
155	49.14090	138.72	11.047	-34583.32	0.0035177
160	47.26480	132.57	10.501	-30253.11	0.0037761
165	46.35467	126.56	9.972	-26341.60	0.0040067
170	45.40567	120.63	9.456	-22786.31	0.0042743
175	44.41146	114.61	8.950	-19540.39	0.0045307
180	43.36359	108.52	8.453	-16566.93	0.0047731
185	42.25940	102.25	7.960	-13834.73	0.0050479
190	41.05510	95.68	7.466	-11315.25	0.0053597
195	39.75178	88.66	6.963	-8980.30	0.00568915
200	38.29638	80.96	6.439	-6799.84	0.0061178
*203.110	37.27957	75.65	6.092	-5506.06	0.006526
*203.110	4.60921	32.35	2.329	-143.92	0.0166737
205	4.55972	33.33	2.330	-150.63	0.0152719
210	4.25423	35.71	2.332	-164.83	0.0126744
215	4.01103	37.90	2.332	-175.58	0.0109770
220	3.80893	39.95	2.332	-184.09	0.0097643
225	3.63612	41.91	2.331	-191.04	0.0088463
230	3.48533	43.79	2.329	-196.84	0.0081224
235	3.35171	45.60	2.328	-201.77	0.0075341
240	3.23196	47.36	2.326	-206.01	0.0070444
245	3.12334	49.09	2.324	-209.70	0.0066292
250	3.02427	50.77	2.322	-212.94	0.0062716
260	2.84913	54.06	2.317	-218.38	0.0055845
270	2.69918	57.25	2.312	-222.75	0.0052198
280	2.56597	60.37	2.307	-226.33	0.0048405
290	2.44870	63.43	2.302	-229.32	0.0045236
300	2.34364	66.43	2.299	-231.84	0.0042537
320	2.16237	72.32	2.289	-235.84	0.0038159
340	2.01061	78.03	2.280	-238.85	0.0034733
360	1.88107	83.73	2.273	-241.18	0.0031959
380	1.76878	89.31	2.266	-243.01	0.0029655
400	1.67027	94.81	2.259	-244.47	0.0027701
420	1.58298	100.26	2.254	-245.66	0.0026019
440	1.50496	105.67	2.249	-246.64	0.0024551
460	1.43474	111.03	2.244	-247.44	0.0023257
480	1.37114	116.36	2.239	-248.11	0.0022105
500	1.31322	121.66	2.235	-248.67	0.0021072
520	1.26023	126.94	2.231	-249.15	0.0020138
540	1.21152	132.21	2.228	-249.55	0.0019291
560	1.16658	137.45	2.224	-249.89	0.0018516
580	1.12498	142.69	2.220	-250.19	0.0017806
600	1.08624	147.92	2.217	-250.44	0.0017152
650	1.00075	161.00	2.208	-250.92	0.0015719
700	0.92797	174.11	2.198	-251.25	0.0014517
750	0.86527	187.30	2.188	-251.48	0.0013494
800	0.81065	200.42	2.176	-251.63	0.0012610
850	0.76261	214.09	2.163	-251.74	0.0011838
900	0.72003	227.74	2.149	-251.81	0.0011158
950	0.68201	241.59	2.134	-251.85	0.0010554
1000	0.64784	255.44	2.118	-251.87	0.0010014
1100	0.58973	284.29	2.084	-251.87	0.0009086
1200	0.53991	313.96	2.048	-251.84	0.0008318
1300	0.49847	344.29	2.012	-251.79	0.0007672
1400	0.46277	375.28	1.978	-251.73	0.0007119
1500	0.43221	406.83	1.945	-251.67	0.0006642
2000	0.32453	569.93	1.814	-251.37	0.0004979
2500	0.25987	736.80	1.730	-251.14	0.0003984
3000	0.21671	904.19	1.677	-250.96	0.0003321
3500	0.18585	1071.09	1.642	-250.83	0.0002848

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

300 PSIA ISOTHERM

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*114.484	54.21924	201.11	19.399	-108390.66	0.0023138
115	54.15431	200.56	19.091	-106530.97	0.0023277
120	53.50928	193.49	16.829	-90643.31	0.0024663
125	52.83473	184.93	15.375	-77902.34	0.0026086
130	52.13126	176.19	14.332	-67516.75	0.0027524
135	51.40075	167.83	13.509	-58901.98	0.0029173
140	50.64262	160.06	12.809	-51626.49	0.0030447
145	49.85939	152.85	12.180	-45373.46	0.0031476
150	49.04794	146.13	11.594	-39912.71	0.0032598
155	48.20996	139.77	11.036	-35076.07	0.0033660
160	47.34235	133.66	10.499	-30745.30	0.0034720
165	46.44102	127.71	9.979	-26833.75	0.0035540
170	45.50424	121.82	9.471	-23278.76	0.0042103
175	44.52384	115.92	8.975	-20033.52	0.0045115
180	43.49274	109.93	8.487	-17061.47	0.0048724
185	42.40063	103.79	8.004	-14331.86	0.0053158
190	41.23298	97.38	7.521	-11817.34	0.0058788
195	39.96761	90.60	7.033	-9491.32	0.0066279
200	38.56852	83.24	6.528	-7326.63	0.0076956
205	36.96934	74.97	5.999	-5293.24	0.0093344
*209.176	35.37826	66.89	5.495	-3667.86	0.0119498
*209.176	5.90023	31.23	2.362	-146.90	0.0214551
210	5.79977	31.73	2.363	-152.06	0.0202349
215	5.31260	34.45	2.365	-176.54	0.0154187
220	4.95403	36.86	2.366	-193.84	0.0127492
225	4.66958	39.08	2.365	-206.99	0.0110123
230	4.43390	41.16	2.364	-217.44	0.0097753
235	4.23260	43.15	2.362	-226.00	0.0088412
240	4.05729	45.06	2.360	-233.17	0.0081762
245	3.90214	46.90	2.358	-239.27	0.0075098
250	3.76313	48.70	2.355	-244.54	0.0070143
260	3.52262	52.16	2.349	-253.18	0.0062337
270	3.31995	55.50	2.344	-259.98	0.0056422
280	3.14543	58.75	2.338	-265.47	0.0051750
290	2.99266	61.92	2.332	-269.98	0.0047945
300	2.85722	65.02	2.326	-273.76	0.0044771
320	2.62632	71.09	2.315	-279.68	0.0039742
340	2.43536	76.98	2.305	-284.09	0.0035903
360	2.27380	82.75	2.296	-287.47	0.0032950
380	2.13471	88.44	2.287	-290.11	0.0030349
400	2.01333	94.04	2.280	-292.22	0.0028252
420	1.90421	99.59	2.273	-293.92	0.0026463
440	1.81092	105.06	2.266	-295.31	0.0024913
460	1.72519	110.49	2.261	-296.45	0.0023555
480	1.64782	115.88	2.255	-297.41	0.0022353
500	1.57750	121.25	2.250	-298.21	0.0021279
520	1.51326	126.59	2.246	-298.88	0.0020313
540	1.45431	131.89	2.241	-299.45	0.0019438
560	1.39999	137.19	2.237	-299.93	0.0018642
580	1.34975	142.47	2.233	-300.35	0.0017913
600	1.30313	147.74	2.229	-300.70	0.0017243
650	1.20001	160.90	2.219	-301.38	0.0015781
700	1.11245	174.09	2.208	-301.84	0.0014560
750	1.03709	187.34	2.197	-302.17	0.0013523
800	0.97151	200.72	2.185	-302.38	0.0012630
850	0.91387	214.24	2.171	-302.53	0.0011851
900	0.86279	227.93	2.156	-302.62	0.0011166
950	0.81721	241.82	2.141	-302.68	0.0010559
1000	0.77626	255.91	2.124	-302.71	0.0010015
1100	0.70566	284.71	2.089	-302.70	0.0007084
1200	0.64694	314.34	2.053	-302.66	0.0008315
1300	0.59731	344.71	2.017	-302.58	0.0007667
1400	0.55480	375.73	1.982	-302.50	0.0007115
1500	0.51796	407.32	1.948	-302.41	0.0006637
2000	0.38907	570.53	1.816	-301.98	0.0004975
2500	0.31156	737.47	1.732	-301.64	0.0003781
3000	0.25795	904.91	1.678	-301.39	0.0003319
3500	0.22297	1071.93	1.643	-301.19	0.0002946

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

150 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DV)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*114.610	54.27728	202.05	19.174	-108446.53	0.0023319
115	54.17967	201.64	18.951	-107098.21	0.0023121
120	53.53971	194.56	16.722	-91192.02	0.0024491
125	52.86054	185.97	15.230	-78434.70	0.0025498
130	52.16993	177.20	14.263	-68035.60	0.0027119
135	51.44371	168.93	13.454	-59410.41	0.0028748
140	50.69125	161.05	12.767	-52127.41	0.0030198
145	49.91306	153.95	12.149	-45869.33	0.0031696
150	49.10905	147.15	11.574	-40405.06	0.0033280
155	48.27826	140.82	11.026	-35567.24	0.0034994
160	47.41379	134.75	10.498	-31235.64	0.0036992
165	46.52776	128.85	9.986	-27323.75	0.0039033
170	45.60117	123.02	9.497	-23768.72	0.0041490
175	44.63375	117.20	8.999	-20523.73	0.0044360
180	43.61858	111.31	8.519	-17552.41	0.0047773
185	42.54636	105.29	8.046	-14824.66	0.0051926
190	41.40422	99.05	7.574	-12313.83	0.0057130
195	40.17327	92.47	7.099	-9994.73	0.0063923
200	38.82169	85.41	6.612	-7842.30	0.0073328
205	37.30336	77.59	6.098	-5830.51	0.0087580
210	35.50578	68.55	5.531	-3929.56	0.0112783
*214.544	33.39598	58.31	4.911	-2259.93	0.0165643
*214.544	7.30686	30.13	2.395	-138.16	0.0295912
215	7.21158	30.45	2.395	-143.09	0.0280577
220	6.44030	33.54	2.399	-182.85	0.0197667
225	5.93006	36.16	2.399	-209.56	0.0146745
230	5.54610	38.52	2.399	-227.30	0.0122905
235	5.23796	40.72	2.377	-241.83	0.0106790
240	4.98074	42.70	2.395	-253.52	0.0095191
245	4.76019	44.77	2.392	-263.20	0.0086334
250	4.56738	46.68	2.389	-271.37	0.0079309
260	4.24273	50.34	2.383	-284.44	0.0068790
270	3.97646	53.83	2.376	-294.46	0.0061216
280	3.75158	57.21	2.359	-302.41	0.0055451
290	3.55762	60.48	2.352	-308.86	0.0050985
300	3.38763	63.69	2.355	-314.20	0.0047158
320	3.10150	69.90	2.342	-322.48	0.0041397
340	2.86788	75.94	2.330	-328.57	0.0037106
360	2.67203	81.83	2.319	-333.20	0.0033756
380	2.50459	87.62	2.309	-336.80	0.0031049
400	2.35923	93.31	2.300	-339.65	0.0028905
420	2.23150	98.93	2.292	-341.95	0.0026906
440	2.11913	104.48	2.285	-343.83	0.0025273
460	2.01666	109.98	2.278	-345.37	0.0023850
480	1.92518	115.44	2.271	-346.65	0.0022597
500	1.84220	120.85	2.266	-347.72	0.0021483
520	1.76652	126.24	2.260	-348.62	0.0020484
540	1.69717	131.60	2.255	-349.38	0.0019583
560	1.63334	136.94	2.250	-350.03	0.0018764
580	1.57437	142.26	2.245	-350.58	0.0018017
600	1.51970	147.57	2.241	-351.05	0.0017332
650	1.39892	160.82	2.230	-351.95	0.0015342
700	1.29652	174.08	2.218	-352.57	0.0014602
750	1.20848	187.40	2.206	-353.00	0.0013552
800	1.13193	200.82	2.193	-353.29	0.0012649
850	1.06469	214.39	2.179	-353.48	0.0011864
900	1.00514	228.13	2.163	-353.60	0.0011174
950	0.95200	242.05	2.147	-353.67	0.0010563
1000	0.90428	256.18	2.130	-353.70	0.0010017
1100	0.82205	285.04	2.074	-353.70	0.0009083
1200	0.75366	314.71	2.057	-353.63	0.0008311
1300	0.69587	345.13	2.021	-353.52	0.0007463
1400	0.64637	376.19	1.985	-353.41	0.0007110
1500	0.60348	407.80	1.952	-353.28	0.0006632
2000	0.45326	571.14	1.819	-352.69	0.0004770
2500	0.36316	738.15	1.733	-352.23	0.0003978
3000	0.30273	905.62	1.680	-351.89	0.0003316
3500	0.25984	1072.57	1.644	-351.62	0.0002944

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

400 PSIA ISONAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DH)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*114.755	54.23540	202.90	18.954	-109545.17	0.0022902
115	54.20490	202.72	18.814	-107665.64	0.0022966
120	53.56799	195.63	16.616	-91740.80	0.0024322
125	52.90214	187.01	15.206	-78966.98	0.0025713
130	52.20904	178.22	14.195	-68554.17	0.0027117
135	51.48694	169.83	13.401	-59918.31	0.0028526
140	50.72966	162.05	12.726	-52627.55	0.0029952
145	49.96721	154.85	12.113	-46354.27	0.0031422
150	49.16949	148.16	11.554	-40896.63	0.0032969
155	48.34571	141.86	11.015	-36056.86	0.0034538
160	47.49417	135.83	10.496	-31724.18	0.0036177
165	46.61222	129.98	9.992	-27811.69	0.0038542
170	45.69422	124.21	9.502	-24256.30	0.0040902
175	44.74135	118.47	9.022	-21011.18	0.0043640
180	43.74131	112.57	8.551	-18040.12	0.0046375
185	42.69778	106.76	8.085	-15313.45	0.0050775
190	41.56940	100.66	7.675	-12805.23	0.0055602
195	40.36988	94.28	7.162	-10491.33	0.0061798
200	39.06428	87.48	6.670	-8348.37	0.0070165
205	37.61033	80.05	6.139	-6353.04	0.0082345
210	35.93086	71.65	5.667	-4481.28	0.0102355
215	33.83848	61.54	5.051	-2704.43	0.0143684
*219.374	31.15626	49.57	4.329	-1181.96	0.0264912
*219.374	9.06170	29.08	2.427	-114.51	0.0465109
220	8.81959	29.61	2.423	-126.28	0.0406574
225	7.61461	33.05	2.433	-196.57	0.0225142
230	6.91858	35.83	2.434	-221.88	0.0165943
235	6.42224	38.30	2.432	-246.68	0.0134641
240	6.03577	40.57	2.430	-265.51	0.0114913
245	5.71945	42.70	2.427	-280.49	0.0101136
250	5.45202	44.74	2.424	-292.77	0.0090872
255	5.01707	48.60	2.417	-311.84	0.0076453
260	4.67196	52.24	2.409	-326.06	0.0066686
265	4.38543	55.74	2.401	-337.11	0.0059555
290	4.14499	59.12	2.392	-345.95	0.0054076
300	3.92569	62.41	2.385	-353.18	0.0049707
320	3.58818	68.79	2.369	-364.27	0.0043122
340	3.30322	74.95	2.355	-372.33	0.0038342
360	3.07572	80.96	2.343	-378.41	0.0034676
380	2.87933	86.84	2.331	-383.11	0.0031755
400	2.70790	92.62	2.321	-386.82	0.0029358
420	2.55876	98.31	2.311	-389.80	0.0027347
440	2.42684	103.94	2.303	-392.22	0.0025630
460	2.30908	109.50	2.295	-394.21	0.0024143
480	2.20317	115.02	2.289	-395.85	0.0022839
500	2.10728	120.49	2.281	-397.23	0.0021694
520	2.01996	125.92	2.275	-398.39	0.0020653
540	1.94006	131.33	2.269	-399.37	0.0019725
560	1.86661	136.71	2.263	-400.19	0.0018885
580	1.79982	142.07	2.259	-400.90	0.0018120
600	1.73603	147.42	2.253	-401.50	0.0017419
650	1.59747	160.75	2.240	-402.65	0.0015701
700	1.48017	174.08	2.229	-403.44	0.0014642
750	1.37944	187.46	2.215	-403.98	0.0013579
800	1.29190	200.94	2.201	-404.35	0.0012667
850	1.21507	214.55	2.185	-404.59	0.0011876
900	1.14705	228.33	2.170	-404.74	0.0011181
950	1.08638	242.29	2.154	-404.82	0.0010567
1000	1.03172	256.45	2.136	-404.86	0.0010019
1100	0.93908	285.37	2.100	-404.85	0.0009081
1200	0.86007	315.09	2.062	-404.75	0.0008309
1300	0.79415	345.55	2.025	-404.61	0.0007658
1400	0.73749	376.65	1.989	-404.46	0.0007105
1500	0.68878	408.29	1.955	-404.29	0.0006627
2000	0.51756	571.74	1.820	-403.52	0.0004366
2500	0.41666	738.82	1.735	-402.92	0.0003974
3000	0.34594	906.34	1.631	-402.46	0.0003314
3500	0.29677	1073.32	1.645	-402.12	0.0002842

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

450 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/RTU	V(DP/DV) PSIA	(DV/DT) / V DEG. R
*114.800	54.24360	203.93	18.741	-108626.54	0.0027785
115	54.23002	203.91	18.677	-108233.28	0.0027413
120	53.59710	176.70	16.513	-92289.68	0.0024154
125	52.93553	188.06	15.123	-79499.17	0.0025530
130	52.24599	170.24	14.120	-69872.74	0.0026917
135	51.52964	170.37	13.348	-60495.71	0.0028307
140	50.78766	163.04	12.635	-53126.96	0.0029711
145	50.02044	155.95	12.090	-46858.16	0.0031153
150	49.22928	149.17	11.534	-41386.96	0.0032666
155	48.41235	142.89	11.005	-36545.00	0.0034291
160	47.56951	136.90	10.495	-32211.00	0.0036075
165	46.69537	131.09	9.999	-28297.64	0.0038069
170	45.78958	125.39	9.516	-24741.61	0.0040336
175	44.84673	119.72	9.044	-21496.00	0.0042953
180	43.86110	114.01	8.581	-18524.74	0.0046024
185	42.82521	108.21	8.125	-15798.51	0.0049595
190	41.72901	102.24	7.673	-13291.95	0.0054189
195	40.55935	96.03	7.221	-10931.83	0.0059870
200	39.29218	89.46	6.764	-8846.04	0.0067375
205	37.99669	82.37	6.271	-6863.26	0.0077940
210	36.31159	74.49	5.798	-5012.94	0.0094327
215	34.41037	65.33	5.226	-3274.97	0.0124351
220	31.82869	53.71	4.526	-1625.20	0.0203947
*223.750	28.19451	40.18	3.673	-395.18	0.0626003
*223.750	11.59543	28.19	2.453	-69.64	0.1034313
225	10.55770	29.44	2.455	-110.66	0.0576852
230	8.78576	33.04	2.459	-192.08	0.0259760
235	7.88927	35.89	2.469	-236.48	0.0182058
240	7.27763	38.40	2.457	-266.99	0.0144330
245	6.81259	40.71	2.454	-289.90	0.0121436
250	6.43772	42.89	2.460	-307.99	0.0105839
255	5.95509	46.95	2.452	-335.12	0.0085655
260	5.41099	50.75	2.443	-354.69	0.0072954
270	5.05378	54.36	2.433	-369.56	0.0064111
290	4.75626	57.84	2.424	-381.29	0.0057538
300	4.50225	61.22	2.415	-390.76	0.0052426
320	4.08659	67.74	2.397	-405.13	0.0044919
340	3.75639	74.03	2.331	-415.45	0.0039603
360	3.48491	80.14	2.267	-423.16	0.0035609
380	3.25586	86.11	2.353	-429.10	0.0032464
400	3.05923	91.97	2.342	-433.77	0.0029911
420	2.88720	97.74	2.331	-437.50	0.0027786
440	2.73695	103.43	2.321	-440.53	0.0025984
460	2.60239	109.05	2.312	-443.01	0.0024431
480	2.48172	114.62	2.304	-445.06	0.0023076
500	2.37267	120.15	2.296	-446.77	0.0021882
520	2.27354	125.63	2.289	-448.21	0.0020818
540	2.18294	131.08	2.283	-449.42	0.0019864
560	2.09975	136.50	2.277	-450.45	0.0019002
580	2.02306	141.90	2.271	-451.32	0.0018220
600	1.95208	147.29	2.265	-452.07	0.0017505
650	1.79565	160.69	2.251	-453.49	0.0015959
700	1.66340	174.09	2.238	-454.46	0.0014691
750	1.54994	187.53	2.224	-455.12	0.0013606
800	1.45143	201.06	2.209	-455.57	0.0012685
850	1.36501	214.72	2.194	-455.86	0.0011887
900	1.28854	228.54	2.177	-456.04	0.0011188
950	1.22036	242.54	2.160	-456.14	0.0010570
1000	1.15916	256.73	2.142	-456.19	0.0010019
1100	1.05376	285.71	2.105	-456.16	0.0009079
1200	0.96616	315.48	2.067	-456.03	0.0008304
1300	0.89215	345.97	2.029	-455.85	0.0007654
1400	0.82974	377.11	1.993	-455.65	0.0007100
1500	0.77385	408.79	1.958	-455.44	0.0006622
2000	0.58142	572.35	1.822	-454.46	0.0004962
2500	0.46607	739.50	1.737	-453.69	0.0003971
3000	0.38888	907.06	1.632	-453.12	0.0003312
3500	0.33365	1074.06	1.646	-452.69	0.0002840

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

500 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*115.075	54.25149	204.87	18.533	-108710.61	0.0022658
120	53.62606	197.78	16.411	-92838.65	0.0023988
125	52.96873	189.11	15.041	-80031.31	0.0025349
130	52.28368	180.26	14.064	-69590.49	0.0026720
135	51.57212	171.83	13.297	-60932.63	0.0028092
140	50.83526	164.03	12.645	-53625.64	0.0029475
145	50.07396	156.84	12.051	-47351.09	0.0030890
150	49.28844	150.17	11.515	-41876.09	0.0032370
155	48.47819	143.92	10.995	-37031.71	0.0033953
160	47.64186	137.96	10.493	-32696.13	0.0035684
165	46.77725	132.20	10.036	-28781.67	0.0037612
170	45.88132	126.56	9.531	-25224.72	0.0039792
175	44.95001	120.95	9.066	-21978.31	0.0042297
180	43.97813	115.33	8.611	-19006.43	0.0045216
185	42.95993	109.62	8.163	-16280.08	0.0048679
190	41.88348	103.78	7.730	-13774.37	0.0052976
195	40.73944	97.73	7.273	-11466.80	0.0058109
200	39.50992	91.37	6.833	-9336.30	0.0064891
205	38.16410	84.57	6.377	-7362.99	0.0074167
210	36.65789	77.12	5.899	-5528.59	0.0087906
215	34.89967	68.68	5.377	-3817.37	0.0110999
220	32.67270	58.56	4.765	-2217.86	0.0160249
225	29.11015	44.68	3.907	-726.80	0.0368093
230	12.11676	30.15	2.509	-113.72	0.0660815
235	9.87963	33.53	2.508	-204.39	0.0280814
240	8.80650	36.33	2.505	-255.03	0.0192461
245	8.09090	38.83	2.502	-289.98	0.0150706
250	7.55388	41.14	2.498	-316.27	0.0125785
260	6.76865	45.40	2.488	-354.02	0.0096823
270	6.19941	49.35	2.477	-380.28	0.0080164
280	5.75530	53.08	2.467	-399.79	0.0069171
290	5.39292	56.65	2.456	-414.92	0.0061291
300	5.09812	60.11	2.445	-427.01	0.0055320
320	4.59695	66.77	2.425	-445.12	0.0046785
340	4.21238	73.16	2.407	-457.98	0.0040903
360	3.89920	79.37	2.391	-467.52	0.0036552
380	3.63706	85.43	2.376	-474.82	0.0033176
400	3.41313	91.36	2.362	-480.54	0.0030462
420	3.21882	97.20	2.350	-485.09	0.0028221
440	3.04807	102.95	2.339	-488.78	0.0026334
460	2.89649	108.63	2.329	-491.80	0.0024716
480	2.76076	114.26	2.320	-494.29	0.0023310
500	2.63833	119.83	2.312	-496.36	0.0022076
520	2.52720	125.36	2.304	-498.10	0.0020980
540	2.42577	130.85	2.297	-499.56	0.0020000
560	2.33274	136.31	2.290	-500.80	0.0019118
580	2.24706	141.75	2.283	-501.86	0.0018317
600	2.16783	147.17	2.277	-502.75	0.0017598
650	1.99343	160.65	2.262	-504.47	0.0016015
700	1.84618	174.12	2.248	-505.64	0.0014719
750	1.71999	187.61	2.233	-506.43	0.0013631
800	1.61050	201.19	2.217	-506.96	0.0012702
850	1.51451	214.90	2.201	-507.30	0.0011898
900	1.42960	228.75	2.184	-507.52	0.0011195
950	1.35392	242.79	2.167	-507.63	0.0010573
1000	1.28601	257.01	2.148	-507.68	0.0010020
1100	1.16909	286.04	2.110	-507.63	0.0009076
1200	1.07193	315.86	2.071	-507.46	0.0008300
1300	0.98986	346.40	2.033	-507.24	0.0007649
1400	0.91958	377.57	1.996	-506.99	0.0007095
1500	0.85869	409.28	1.952	-506.73	0.0006617
2000	0.64554	572.96	1.825	-505.50	0.0004958
2500	0.51739	740.17	1.738	-504.56	0.0003968
3000	0.43176	907.78	1.683	-503.85	0.0003309
3500	0.37047	1074.80	1.647	-503.37	0.0002839

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

450 PSIA 1509AR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) RTU/LB	V(DP/DH) PSIA-CU FT/RTU	V(DP/DV) T PSIA	(DH/DT) / V P DEG. R
*115.140	54.26026	205.82	18.331	-108797.35	0.0022553
120	53.65487	198.86	16.310	-93387.72	0.0023424
125	53.00172	190.16	14.961	-80563.40	0.0025171
130	52.32112	181.29	14.000	-70108.28	0.0026526
135	51.61428	172.83	13.246	-61439.08	0.0027881
140	50.88246	165.02	12.607	-54123.62	0.0029242
145	50.12659	157.83	12.032	-47843.08	0.0030632
150	49.34699	151.17	11.497	-42364.05	0.0032080
155	48.54326	144.94	10.995	-37517.01	0.0033624
160	47.71423	139.02	10.492	-33179.65	0.0035305
165	46.85791	133.30	10.012	-29263.85	0.0037169
170	45.97150	127.71	9.545	-25705.75	0.0039269
175	45.05128	122.17	9.097	-22458.23	0.0041668
180	44.09253	116.62	8.640	-19485.37	0.0044448
185	43.08916	111.02	8.199	-16758.38	0.0047722
190	42.03319	105.29	7.765	-14252.80	0.0051652
195	40.91393	99.39	7.333	-11946.76	0.0056493
200	39.71573	93.22	6.899	-9819.98	0.0062659
205	38.41579	86.67	6.458	-7853.68	0.0070389
210	36.97453	79.59	5.999	-6031.08	0.0082621
215	35.33063	71.72	5.509	-4338.81	0.0101073
220	33.33638	62.62	4.957	-2770.01	0.0135467
225	30.59250	51.35	4.272	-1334.50	0.0226333
230	24.36695	34.98	3.119	-167.37	0.1120402
235	13.16597	31.57	2.553	-143.02	0.0577957
240	10.82713	34.47	2.543	-226.84	0.0281877
245	9.63873	37.12	2.543	-279.52	0.0195437
250	8.84323	39.55	2.537	-317.03	0.0153176
260	7.77250	43.99	2.526	-368.46	0.0110499
270	7.04345	48.06	2.513	-402.89	0.0088472
280	6.49439	51.89	2.501	-427.88	0.0074785
290	6.05650	55.55	2.489	-446.96	0.0065349
300	5.69406	59.09	2.477	-462.03	0.0058392
320	5.11937	65.96	2.454	-484.34	0.0048718
340	4.67614	72.36	2.434	-500.01	0.0042222
360	4.31878	78.65	2.415	-511.54	0.0037503
380	4.02180	84.79	2.399	-520.32	0.0033899
400	3.76947	90.80	2.384	-527.17	0.0031010
420	3.55141	96.70	2.370	-532.62	0.0028653
440	3.36042	102.51	2.358	-537.01	0.0026679
460	3.19132	108.25	2.347	-540.60	0.0024996
480	3.04023	113.97	2.337	-543.56	0.0023540
500	2.90419	119.54	2.329	-546.02	0.0022266
520	2.78089	125.11	2.319	-548.08	0.0021139
540	2.66950	130.64	2.311	-549.81	0.0020134
560	2.56554	136.14	2.303	-551.28	0.0019230
580	2.47079	141.61	2.295	-552.52	0.0018412
600	2.38226	147.06	2.289	-553.58	0.0017668
650	2.19080	160.62	2.273	-555.60	0.0016069
700	2.02852	174.15	2.257	-556.97	0.0014756
750	1.88957	187.70	2.242	-557.90	0.0013656
800	1.76911	201.33	2.226	-558.52	0.0012718
850	1.66355	215.08	2.209	-558.92	0.0011908
900	1.57023	228.97	2.191	-559.16	0.0011201
950	1.48707	243.04	2.173	-559.29	0.0010576
1000	1.41247	257.30	2.154	-559.34	0.0010021
1100	1.28407	286.39	2.115	-559.26	0.0009074
1200	1.17739	316.25	2.076	-559.06	0.0008296
1300	1.08729	346.83	2.037	-558.78	0.0007644
1400	1.01014	378.03	2.000	-558.47	0.0007090
1500	0.94331	409.77	1.965	-558.15	0.0006612
2000	0.70932	573.56	1.827	-556.67	0.0004753
2500	0.56861	740.85	1.740	-555.52	0.0003965
3000	0.47457	908.49	1.685	-554.66	0.0003307
3500	0.40725	1075.55	1.648	-554.01	0.0002837

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

600 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(OP/DV)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*115.205	54.26872	206.76	18.134	-109886.72	0.0022438
120	53.68352	199.94	16.211	-93936.91	0.0023661
125	53.03452	191.21	14.893	-81095.45	0.0024994
130	52.35821	182.30	13.977	-70625.84	0.0026335
135	51.65613	173.83	13.196	-61945.09	0.0027677
140	50.92928	166.00	12.568	-54620.93	0.0029014
145	50.17874	158.81	12.005	-48334.17	0.0030379
150	49.40493	152.17	11.478	-42850.87	0.0031797
155	48.60759	145.96	10.976	-38000.97	0.0033303
160	47.78567	140.07	10.491	-33661.61	0.0034937
165	46.93739	134.39	10.019	-29744.25	0.0036741
170	46.06018	128.85	9.559	-26184.75	0.0038764
175	45.15064	123.37	9.109	-22935.87	0.0041065
180	44.20446	117.90	8.668	-19961.69	0.0043716
185	43.21612	112.33	8.235	-17233.61	0.0046817
190	42.17850	106.77	7.808	-14727.55	0.0050508
195	41.08209	101.00	7.385	-12422.12	0.0055002
200	39.91367	95.00	6.962	-10297.75	0.0060640
205	38.65186	89.69	6.533	-8336.47	0.0068005
210	37.27237	81.92	6.093	-6522.52	0.0078174
215	35.71778	74.51	5.629	-4843.81	0.0093381
220	33.89163	66.17	5.120	-3295.09	0.0119118
225	31.56486	56.37	4.527	-1886.70	0.0173340
230	27.95726	44.13	3.742	-686.62	0.0359102
235	19.66222	32.82	2.759	-139.37	0.0931191
240	13.73587	33.29	2.607	-188.95	0.0460227
245	11.59906	35.75	2.590	-259.78	0.0266673
250	10.36763	38.19	2.581	-310.78	0.0191536
260	8.88467	42.74	2.566	-378.69	0.0127296
270	7.95007	46.90	2.551	-422.72	0.0098026
280	7.27414	50.82	2.537	-454.02	0.0080993
290	6.74844	54.55	2.523	-477.56	0.0069720
300	6.32072	58.14	2.509	-495.96	0.0061640
320	5.65394	65.03	2.484	-522.89	0.0050711
340	5.14755	71.62	2.461	-541.62	0.0043562
360	4.74342	77.99	2.440	-555.30	0.0038459
380	4.40995	84.20	2.422	-565.67	0.0034599
400	4.12812	90.27	2.405	-573.73	0.0031555
420	3.89556	96.23	2.390	-580.11	0.0029080
440	3.67380	102.10	2.377	-585.26	0.0027019
460	3.48679	107.89	2.365	-589.45	0.0025271
480	3.32005	113.61	2.353	-592.90	0.0023766
500	3.17019	119.27	2.343	-595.77	0.0022452
520	3.03457	124.88	2.334	-598.17	0.0021294
540	2.91110	130.45	2.325	-600.18	0.0020263
560	2.79811	135.99	2.317	-601.89	0.0019339
580	2.69423	141.49	2.309	-603.33	0.0018505
600	2.59934	146.98	2.301	-604.56	0.0017747
650	2.38773	160.61	2.284	-606.90	0.0016122
700	2.21038	174.20	2.267	-608.48	0.0014792
750	2.05868	187.80	2.251	-609.55	0.0013690
800	1.92725	201.48	2.234	-610.26	0.0012734
850	1.81214	215.27	2.216	-610.71	0.0011918
900	1.71042	229.20	2.198	-610.98	0.0011206
950	1.61981	243.30	2.180	-611.13	0.0010579
1000	1.53954	257.59	2.160	-611.17	0.0010021
1100	1.39869	286.73	2.121	-611.07	0.0009072
1200	1.28253	316.64	2.091	-610.81	0.0008292
1300	1.18444	347.26	2.041	-610.47	0.0007540
1400	1.10045	378.50	2.004	-610.10	0.0007095
1500	1.02770	410.27	1.968	-609.72	0.0006607
2000	0.77296	574.17	1.829	-607.94	0.0004749
2500	0.61975	741.53	1.741	-606.57	0.0003962
3000	0.51732	909.21	1.686	-605.55	0.0003304
3500	0.44398	1076.29	1.649	-604.78	0.0002935

* INDICATES TWO PHASE BOUNDARY

650 PSIA ISORAP

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DU)	V(OP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*115.450	54.27725	207.71	17.942	-108978.69	0.0022373
120	53.71291	201.03	16.114	-94496.22	0.0023500
125	53.06712	192.27	14.805	-81627.47	0.0024820
130	52.39526	183.33	13.875	-71143.19	0.0026146
135	51.69767	174.83	13.147	-62450.68	0.0027467
140	50.97571	166.99	12.531	-55117.59	0.0028789
145	50.23041	159.79	11.977	-48824.39	0.0030131
150	49.46729	153.16	11.460	-43336.60	0.0031520
155	48.67118	146.97	10.967	-38493.61	0.0032990
160	47.85620	141.11	10.489	-34142.04	0.0034578
165	47.01573	135.47	10.025	-30222.93	0.0036126
170	46.14742	129.98	9.572	-26651.82	0.0037277
175	45.24917	124.56	9.129	-23411.32	0.0040486
180	44.31402	119.16	8.695	-20435.51	0.0043018
185	43.33999	113.73	8.269	-17705.96	0.0045961
190	42.31968	108.22	7.850	-15198.86	0.0049435
195	41.24470	102.57	7.435	-12893.27	0.0053622
200	40.10360	96.74	7.021	-10770.18	0.0058302
205	38.87996	90.62	6.605	-8812.28	0.0065442
210	37.54902	84.13	6.130	-7004.51	0.0074364
215	36.07060	77.11	5.737	-5335.48	0.0087162
220	34.37329	69.36	5.262	-3800.26	0.0107351
225	32.31155	60.56	4.729	-2407.23	0.0144354
230	29.51589	50.26	4.098	-1200.79	0.0232612
235	24.76598	38.89	3.266	-372.15	0.0524348
240	18.04146	34.16	2.740	-199.56	0.0612818
245	14.16784	35.13	2.653	-243.05	0.0369231
250	12.20786	37.24	2.631	-301.47	0.0243691
260	10.12576	41.70	2.609	-385.74	0.0147717
270	8.92656	45.90	2.591	-440.27	0.0108929
280	8.09752	49.87	2.574	-478.52	0.0087811
290	7.47001	53.65	2.558	-506.95	0.0074400
300	6.96865	57.29	2.542	-528.98	0.0065055
320	6.20763	64.27	2.514	-560.92	0.0052758
340	5.62648	70.94	2.488	-582.91	0.0044919
360	5.17292	77.38	2.465	-598.88	0.0039419
380	4.80134	83.66	2.445	-610.93	0.0035306
400	4.48895	89.79	2.427	-620.25	0.0032094
420	4.22116	95.80	2.410	-627.63	0.0029501
440	3.98811	101.72	2.396	-633.56	0.0027354
460	3.78282	107.56	2.382	-638.38	0.0025542
480	3.60017	113.32	2.370	-642.35	0.0023987
500	3.43628	119.03	2.359	-645.64	0.0022634
520	3.28818	124.68	2.349	-648.39	0.0021445
540	3.15352	130.29	2.339	-650.70	0.0020390
560	3.03042	135.86	2.330	-652.65	0.0019446
580	2.91734	141.39	2.322	-654.30	0.0018595
600	2.81304	146.90	2.314	-655.70	0.0017823
650	2.58422	160.61	2.295	-658.37	0.0016173
700	2.39177	174.25	2.277	-660.17	0.0014826
750	2.22731	187.91	2.260	-661.38	0.0013703
800	2.09491	201.63	2.242	-662.18	0.0012749
850	1.96028	215.46	2.224	-662.69	0.0011927
900	1.85017	229.43	2.205	-662.99	0.0011211
950	1.75212	243.57	2.186	-663.14	0.0010581
1000	1.66421	257.88	2.166	-663.18	0.0010021
1100	1.51296	287.08	2.126	-663.04	0.0009069
1200	1.38736	317.03	2.085	-662.72	0.0008288
1300	1.28131	347.69	2.046	-662.32	0.0007535
1400	1.19951	378.97	2.008	-661.88	0.0007080
1500	1.11186	410.77	1.972	-661.42	0.0006601
2000	0.83647	574.79	1.831	-659.32	0.0004945
2500	0.67779	742.20	1.743	-657.72	0.0003958
3000	0.56000	909.93	1.687	-656.52	0.0003302
3500	0.48066	1077.04	1.650	-655.61	0.0002833

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

700 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*115.565	54.28586	208.66	17.755	-109073.24	0.0022210
120	53.74036	202.12	16.018	-95035.66	0.0023341
125	53.09953	193.32	14.729	-82159.48	0.0024647
130	52.43196	184.35	13.814	-71660.34	0.0025959
135	51.73391	175.83	13.099	-62955.87	0.0027264
140	51.02176	167.97	12.494	-55613.63	0.0028568
145	50.28162	160.77	11.951	-49313.76	0.0029887
150	49.51907	154.15	11.443	-43821.27	0.0031249
155	48.73407	147.97	10.958	-38964.98	0.0032685
160	47.92585	142.14	10.488	-34621.01	0.0034230
165	47.09297	136.54	10.031	-30699.94	0.0035923
170	46.23328	131.10	9.585	-27137.02	0.0037807
175	45.34394	125.74	9.149	-23884.67	0.0039930
180	44.42134	120.40	8.721	-20906.97	0.0042351
185	43.46075	115.05	8.303	-18175.58	0.0045148
190	42.45702	109.64	7.890	-15666.95	0.0048425
195	41.40712	104.11	7.483	-13360.55	0.0052138
200	40.28626	98.42	7.079	-11237.79	0.0057119
205	39.09547	92.49	6.673	-9291.90	0.0063145
210	37.80925	86.24	6.261	-7478.33	0.0071055
215	36.39566	79.56	5.837	-5816.03	0.0082015
220	34.80121	72.29	5.389	-4289.89	0.0098387
225	32.92692	64.22	4.899	-2905.92	0.0125662
230	30.56226	55.12	4.341	-1694.99	0.0179281
235	27.18617	45.12	3.675	-758.54	0.0309077
240	22.08786	37.52	3.024	-324.15	0.0500399
245	17.31802	35.91	2.763	-255.67	0.0436158
250	14.42285	36.99	2.697	-301.51	0.0302179
260	11.51528	40.95	2.656	-392.14	0.0171572
270	9.97956	45.08	2.633	-456.51	0.0121145
280	8.96709	49.06	2.612	-501.90	0.0095210
290	8.22221	52.87	2.594	-535.49	0.0079367
300	7.63815	56.54	2.576	-561.35	0.0068621
320	6.75932	63.59	2.544	-598.57	0.0054849
340	6.11772	70.32	2.516	-624.00	0.0046287
360	5.60710	76.83	2.491	-642.37	0.0040376
380	5.19580	83.16	2.468	-656.16	0.0036009
400	4.85179	89.35	2.448	-666.81	0.0032627
420	4.55807	95.41	2.431	-675.21	0.0029915
440	4.30325	101.38	2.415	-681.95	0.0027683
460	4.07933	107.26	2.400	-687.43	0.0025806
480	3.88050	113.06	2.397	-691.93	0.0024202
500	3.70240	118.91	2.375	-695.65	0.0022812
520	3.54168	124.50	2.364	-698.76	0.0021593
540	3.39572	130.14	2.353	-701.37	0.0020514
560	3.26242	135.74	2.344	-703.58	0.0019550
580	3.14010	141.31	2.335	-705.44	0.0018683
600	3.02734	146.85	2.326	-707.02	0.0017898
650	2.78025	160.62	2.306	-710.03	0.0016222
700	2.57267	174.32	2.287	-712.05	0.0014859
750	2.39545	188.03	2.269	-713.40	0.0013725
800	2.24210	201.80	2.250	-714.29	0.0012763
850	2.10795	215.67	2.232	-714.85	0.0011936
900	1.98948	229.67	2.212	-715.17	0.0011216
950	1.88402	243.84	2.193	-715.33	0.0010583
1000	1.78949	258.18	2.173	-715.36	0.0010021
1100	1.62698	287.43	2.131	-715.17	0.0009766
1200	1.49188	317.43	2.090	-714.80	0.0009284
1300	1.37770	348.12	2.050	-714.32	0.0009730
1400	1.28032	379.44	2.011	-713.80	0.00097074
1500	1.19580	411.27	1.975	-713.26	0.0009596
2000	0.89783	575.39	1.833	-710.82	0.0004941
2500	0.72173	742.88	1.745	-708.95	0.0003955
3000	0.60262	910.65	1.688	-707.56	0.0003300
3500	0.51730	1077.78	1.651	-706.51	0.0002831

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

750 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/BTU	V(DP/DV) PSIA	(DV/DT) / V DEG. R
*115.700	54.29455	209.62	17.572	-109170.33	0.0022097
120	53.76856	203.22	15.974	-95535.24	0.0023183
125	53.13175	194.33	14.654	-82691.48	0.0024477
130	52.46843	185.38	13.754	-72177.31	0.0025775
135	51.77986	176.83	13.051	-63460.66	0.0027065
140	51.06745	168.95	12.458	-56109.07	0.0028351
145	50.33237	161.75	11.924	-49802.30	0.0029649
150	49.57530	155.13	11.426	-44304.90	0.0030934
155	48.79626	148.97	10.949	-39445.12	0.0032386
160	47.99464	143.17	10.487	-35098.55	0.0033891
165	47.16914	137.61	10.037	-31175.34	0.0035533
170	46.31781	132.21	9.598	-27610.41	0.0037353
175	45.43804	126.90	9.168	-24356.02	0.0039395
180	44.52653	121.63	8.747	-21376.17	0.0041713
185	43.57916	116.36	8.335	-18642.63	0.0044375
190	42.59076	111.03	7.930	-16132.06	0.0047474
195	41.55471	105.61	7.530	-13824.24	0.0051140
200	40.46728	100.05	7.134	-11700.99	0.0055571
205	39.30151	94.30	6.738	-9745.96	0.0061371
210	38.05525	88.26	6.338	-7944.97	0.0069144
215	36.69774	81.87	5.929	-6287.14	0.0077664
220	35.18787	75.00	5.503	-4766.93	0.0091279
225	33.45508	67.50	5.047	-3388.14	0.0112424
230	31.36639	59.26	4.545	-2172.76	0.0149196
235	28.64876	50.34	3.974	-1183.81	0.0222126
240	24.85409	42.17	3.364	-562.74	0.0352194
245	20.42049	38.19	2.948	-357.62	0.0405737
250	16.91716	37.75	2.794	-333.03	0.0336887
260	13.06158	40.60	2.711	-402.85	0.0196806
270	11.11338	44.49	2.678	-473.10	0.0134348
280	9.98447	48.40	2.653	-524.96	0.0103086
290	9.00554	52.21	2.631	-563.62	0.0084570
300	8.32927	55.90	2.612	-593.38	0.0072309
320	7.32976	62.98	2.576	-636.04	0.0056973
340	6.50599	69.77	2.544	-665.01	0.0047659
360	6.04572	76.33	2.517	-695.85	0.0041328
380	5.59313	82.71	2.492	-701.44	0.0036703
400	5.21650	88.94	2.471	-713.45	0.0033151
420	4.89617	95.06	2.451	-722.90	0.0030322
440	4.61910	101.07	2.434	-730.47	0.0028005
460	4.37621	106.99	2.418	-736.62	0.0026065
480	4.16097	112.93	2.404	-741.66	0.0024413
500	3.96848	118.61	2.391	-745.83	0.0022985
520	3.79501	124.34	2.379	-749.31	0.0021737
540	3.63766	130.01	2.368	-752.23	0.0020633
560	3.49410	135.64	2.357	-754.69	0.0019650
580	3.36246	141.24	2.347	-756.77	0.0018767
600	3.24122	146.81	2.338	-758.53	0.0017969
650	2.97579	160.64	2.317	-761.88	0.0016270
700	2.75308	174.40	2.297	-764.12	0.0014991
750	2.56308	188.16	2.278	-765.61	0.0013746
800	2.39880	201.97	2.259	-766.59	0.0012776
850	2.25516	215.89	2.239	-767.19	0.0011944
900	2.12335	229.92	2.220	-767.54	0.0011220
950	2.01550	244.12	2.199	-767.70	0.0010584
1000	1.91436	258.49	2.179	-767.72	0.0010020
1100	1.74044	287.79	2.137	-767.48	0.0009063
1200	1.59608	317.83	2.075	-767.03	0.0008279
1300	1.47421	348.56	2.054	-766.47	0.0007625
1400	1.36988	379.91	2.015	-765.87	0.0007069
1500	1.27952	411.77	1.979	-765.25	0.0006591
2000	0.96306	576.01	1.836	-762.43	0.0004936
2500	0.77259	743.56	1.746	-760.28	0.0003952
3000	0.64517	911.37	1.690	-758.68	0.0003297
3500	0.55388	1078.53	1.652	-757.47	0.0002929

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

800 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/RTU	V(DP/DV) PSIA	(DV/DT) / V DEG. R
*115.834	54.30331	210.57	17.395	-109269.92	0.0021985
120	53.79662	204.32	15.932	-96136.96	0.0023027
125	53.16378	195.45	14.580	-83223.48	0.0024308
130	52.50466	186.40	13.694	-72694.10	0.0025593
135	51.82051	177.93	13.005	-63965.09	0.0026868
140	51.11278	169.93	12.422	-56603.92	0.0028137
145	50.38269	162.72	11.838	-50290.06	0.0029414
150	49.63097	156.11	11.409	-44787.54	0.0030724
155	48.85778	149.97	10.940	-39924.07	0.0032095
160	48.06260	144.19	10.486	-35574.71	0.0033561
165	47.24428	138.66	10.043	-31649.18	0.0035155
170	46.40105	133.30	9.610	-28082.08	0.0036914
175	45.53052	128.05	9.187	-24825.44	0.0038891
180	44.62967	122.84	8.773	-21843.22	0.0041102
185	43.69476	117.64	8.357	-19107.24	0.0043640
190	42.72110	112.40	7.958	-16594.35	0.0046575
195	41.70282	107.09	7.575	-14284.60	0.0050019
200	40.63723	101.65	7.186	-12160.15	0.0054139
205	39.49902	96.05	6.799	-10205.01	0.0059186
210	38.28876	90.21	6.411	-8405.28	0.0065558
215	36.98039	84.07	6.015	-6750.13	0.0073925
220	35.54170	77.53	5.608	-5233.51	0.0085472
225	33.92055	70.50	5.179	-3857.28	0.0102462
230	32.02713	62.91	4.717	-2637.20	0.0129590
235	29.69918	54.80	4.209	-1615.75	0.0176875
240	26.67893	46.92	3.663	-882.04	0.0257872
245	22.95151	41.45	3.191	-520.03	0.0334127
250	19.38695	39.49	2.934	-411.84	0.0327936
260	14.74353	40.76	2.777	-425.69	0.0219422
270	12.32699	44.17	2.728	-492.66	0.0147733
280	10.84961	47.93	2.697	-548.84	0.0111221
290	9.81978	51.68	2.671	-591.99	0.0099924
300	9.04166	55.36	2.648	-625.47	0.0076076
320	7.91158	62.46	2.608	-673.52	0.0059113
340	7.10596	69.29	2.573	-706.08	0.0049029
360	6.48851	75.89	2.543	-729.42	0.0042273
380	5.99311	82.31	2.516	-746.84	0.0037399
400	5.58290	88.58	2.493	-760.23	0.0033667
420	5.23532	94.74	2.472	-770.75	0.0030721
440	4.93555	100.79	2.453	-779.17	0.0028319
460	4.67339	106.75	2.436	-785.99	0.0026317
480	4.44151	112.63	2.421	-791.58	0.0024618
500	4.23447	118.44	2.407	-796.20	0.0023154
520	4.04913	124.20	2.394	-800.06	0.0021876
540	3.87929	129.90	2.382	-803.28	0.0020750
560	3.72540	135.56	2.371	-806.00	0.0019748
580	3.58440	141.19	2.360	-808.30	0.0018850
600	3.45464	146.78	2.351	-810.24	0.0018039
650	3.17083	160.67	2.328	-813.93	0.0016316
700	2.93297	174.49	2.307	-816.39	0.0014921
750	2.73022	188.29	2.287	-818.02	0.0013766
800	2.55502	202.15	2.267	-819.08	0.0012789
850	2.40190	216.09	2.247	-819.73	0.0011952
900	2.26678	230.17	2.227	-820.10	0.0011224
950	2.14556	244.40	2.206	-820.25	0.0010586
1000	2.03984	258.80	2.185	-820.26	0.0010020
1100	1.85365	288.15	2.142	-819.96	0.0009060
1200	1.69996	318.23	2.099	-819.43	0.0008275
1300	1.57024	349.00	2.058	-818.78	0.0007620
1400	1.45919	380.38	2.019	-818.08	0.0007064
1500	1.36390	412.27	1.982	-817.37	0.0006586
2000	1.02614	576.62	1.838	-814.15	0.0004932
2500	0.82335	744.24	1.748	-811.70	0.0003949
3000	0.68766	912.99	1.691	-809.88	0.0003295
3500	0.59042	1079.27	1.653	-808.50	0.0002827

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

900 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DU)	V(OP/DV)	(DV/DV) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*116.103	54.32107	212.48	17.052	-109476.51	0.0021762
120	53.85229	206.53	15.650	-97234.85	0.0022720
125	53.22729	197.58	14.436	-84287.54	0.0023977
130	52.57642	188.46	13.579	-73727.24	0.0025236
135	51.90095	179.83	12.914	-64572.91	0.0026484
140	51.20238	171.89	12.352	-57591.97	0.0027720
145	50.48201	164.67	11.848	-51263.28	0.0028958
150	49.74073	158.06	11.376	-45749.92	0.0030220
155	48.97997	151.94	10.923	-40878.50	0.0031532
160	48.19612	146.21	10.494	-36523.05	0.0032925
165	47.39160	140.75	10.055	-32592.39	0.0034430
170	46.56386	135.47	9.635	-29020.43	0.0036078
175	45.71091	130.31	9.224	-25758.79	0.0037906
180	44.83021	125.22	8.821	-22771.23	0.0039953
185	43.91865	120.16	8.427	-20029.63	0.0042265
190	42.97241	115.08	8.041	-17511.14	0.0044916
195	41.98677	109.95	7.661	-15196.23	0.0047978
200	40.95574	104.73	7.286	-13067.64	0.0051574
205	39.87156	99.40	6.915	-11109.91	0.0055877
210	38.72379	93.90	6.545	-9309.54	0.0061150
215	37.49792	88.18	6.173	-7655.65	0.0067798
220	36.17322	82.19	5.795	-6141.21	0.0076480
225	34.71829	75.88	5.406	-4765.01	0.0088299
230	33.08853	69.21	5.000	-3534.70	0.0105164
235	31.21030	62.24	4.571	-2471.86	0.0130330
240	28.98366	55.26	4.121	-1618.08	0.0168124
245	26.32840	49.08	3.677	-1029.00	0.0216846
250	23.38422	44.92	3.313	-714.29	0.0252438
260	18.22659	42.75	2.958	-539.53	0.0229743
270	14.94099	44.52	2.847	-555.73	0.0169157
280	12.90896	47.62	2.793	-605.83	0.0126653
290	11.53468	51.09	2.756	-652.95	0.0100504
300	10.52628	54.64	2.725	-691.94	0.0083587
320	9.10694	61.67	2.675	-749.56	0.0063364
340	8.12435	68.51	2.633	-789.01	0.0051726
360	7.38534	75.16	2.597	-817.28	0.0044120
380	6.80008	81.64	2.566	-838.34	0.0038721
400	6.32004	87.99	2.538	-854.48	0.0034665
420	5.91618	94.21	2.514	-867.14	0.0031490
440	5.56982	100.32	2.492	-877.24	0.0028925
460	5.26825	106.35	2.472	-885.41	0.0026802
480	5.00248	112.29	2.455	-892.10	0.0025011
500	4.76590	118.17	2.439	-897.62	0.0023476
520	4.55351	123.98	2.424	-902.22	0.0022142
540	4.36147	129.74	2.411	-906.06	0.0020971
560	4.18675	135.46	2.398	-909.29	0.0019933
580	4.02692	141.14	2.386	-912.02	0.0019006
600	3.88002	146.78	2.375	-914.33	0.0018170
650	3.55934	160.78	2.350	-918.68	0.0016403
700	3.29117	174.70	2.327	-921.57	0.0014979
750	3.05294	188.59	2.305	-923.47	0.0013803
800	2.86526	202.53	2.284	-924.68	0.0012913
850	2.69396	216.54	2.262	-925.41	0.0011965
900	2.54228	230.68	2.241	-925.79	0.0011231
950	2.40741	244.97	2.219	-925.93	0.0010587
1000	2.28561	259.43	2.197	-925.88	0.0010017
1100	2.07901	288.88	2.153	-925.44	0.0009053
1200	1.90679	319.05	2.109	-924.72	0.0008266
1300	1.76146	349.89	2.066	-923.87	0.0007409
1400	1.63796	381.33	2.026	-922.96	0.0007053
1500	1.52731	413.28	1.989	-922.05	0.0006575
2000	1.15191	577.85	1.842	-917.93	0.0004923
2500	0.92460	745.60	1.751	-914.83	0.0003942
3000	0.77243	913.53	1.693	-912.52	0.0003290
3500	0.66335	1080.77	1.655	-910.77	0.0002824

* INDICATES TWO PHASE BOUNDARY

1000 PSIA ISOBAR TEMPERATURE DENSITY V(OH/DV) V(OP/DV) V(OP/DV) (DV/DT) /V DEG. R LB/CU FT BTU/LB PSIA-CU FT/BTU PSIA T DEG. R

TEMPERATURE	DENSITY	V(OH/DV)	V(OP/DV)	V(OP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA T	DEG. R
*116.371	54.33911	214.40	16.727	-109692.78	0.0021542
120	53.90739	209.76	15.475	-98335.41	0.0022419
125	53.29009	199.72	14.296	-85351.74	0.0023653
130	52.64729	190.52	13.467	-74759.86	0.0024888
135	51.98028	181.82	12.825	-65979.45	0.0026110
140	51.29061	173.84	12.285	-58577.95	0.0027316
145	50.57956	166.60	11.799	-52233.63	0.0028518
150	49.84845	159.99	11.344	-46708.65	0.0029736
155	49.09745	153.90	10.907	-41828.56	0.0030994
160	48.32658	148.20	10.482	-37466.35	0.0032321
165	47.53517	142.80	10.066	-33529.93	0.0033744
170	46.72276	137.60	9.659	-29952.52	0.0035293
175	45.88558	132.53	9.259	-26685.25	0.0036998
180	45.02362	127.55	8.868	-23691.67	0.0038892
185	44.13358	122.61	8.485	-20743.64	0.0041015
190	43.21232	117.67	8.110	-18418.48	0.0043417
195	42.25603	112.70	7.742	-16097.02	0.0046161
200	41.25929	107.69	7.380	-13962.42	0.0049334
205	40.21926	102.58	7.022	-11999.64	0.0053059
210	39.12211	97.37	6.669	-10195.44	0.0057512
215	37.96426	91.99	6.315	-8538.83	0.0062954
220	36.72770	86.43	5.959	-7021.97	0.0069774
225	35.39402	80.65	5.599	-5641.42	0.0078573
230	33.97606	74.63	5.231	-4399.95	0.0090767
235	32.31626	68.43	4.851	-3308.86	0.0106208
240	30.48652	62.19	4.460	-2390.25	0.0129037
245	28.40174	56.30	4.069	-1675.41	0.0156181
250	26.07201	51.41	3.704	-1187.71	0.0185445
260	21.32941	46.47	3.208	-764.19	0.0204654
270	17.61068	46.28	2.999	-676.34	0.0174358
280	15.07814	48.28	2.907	-689.60	0.0137243
290	13.33947	51.19	2.851	-727.37	0.0109501
300	12.07741	54.45	2.810	-766.07	0.0090455
320	10.33875	61.24	2.746	-829.11	0.0067407
340	9.16379	68.01	2.695	-874.17	0.0054303
360	8.29477	74.66	2.653	-906.87	0.0045880
380	7.61466	81.17	2.616	-931.31	0.0039987
400	7.06164	87.55	2.584	-950.07	0.0035610
420	6.59944	93.82	2.556	-964.77	0.0032215
440	6.20509	99.99	2.531	-976.49	0.0029494
460	5.86315	106.06	2.509	-985.97	0.0027257
480	5.56291	112.06	2.489	-993.72	0.0025379
500	5.29619	117.99	2.471	-1000.11	0.0023777
520	5.05740	123.85	2.455	-1005.42	0.0022391
540	4.84191	129.66	2.440	-1009.86	0.0021178
560	4.64619	135.43	2.426	-1013.58	0.0020106
580	4.46741	141.15	2.412	-1016.72	0.0019151
600	4.30329	146.84	2.400	-1019.37	0.0018293
650	3.94567	160.94	2.372	-1024.36	0.0016483
700	3.66719	174.95	2.347	-1027.64	0.0015031
750	3.39356	188.93	2.323	-1029.78	0.0013837
800	3.17489	202.93	2.300	-1031.12	0.0012833
850	2.98411	217.02	2.277	-1031.90	0.0011977
900	2.81599	231.22	2.255	-1032.28	0.0011236
950	2.66656	245.57	2.232	-1032.37	0.0010587
1000	2.53277	260.08	2.209	-1032.26	0.0010014
1100	2.30295	289.62	2.163	-1031.63	0.0009046
1200	2.11237	319.87	2.118	-1030.68	0.0008256
1300	1.95156	350.79	2.075	-1029.59	0.0007599
1400	1.81393	382.29	2.034	-1028.44	0.0007042
1500	1.69473	414.30	1.995	-1027.29	0.0006564
2000	1.27712	579.08	1.847	-1022.17	0.0004915
2500	1.02549	746.96	1.754	-1018.32	0.0003936
3000	0.95695	914.98	1.696	-1015.47	0.0003285
3500	0.73409	1082.26	1.657	-1013.30	0.0002920

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1100 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. P	LB/CU FT	BTU/LB	PSIA-CU FT/HTU	PSIA	DEG. R
*116.638	54.35744	216.32	16.416	-109918.50	0.0021325
120	53.96193	211.00	15.304	-99436.67	0.0027123
125	53.35217	201.88	14.160	-86416.15	0.0023335
130	52.71727	192.59	13.358	-75792.06	0.0024549
135	52.05853	183.82	12.740	-66984.85	0.0025746
140	51.37751	175.79	12.220	-59562.01	0.0026924
145	50.67570	168.52	11.752	-53201.28	0.0028092
150	49.95420	161.91	11.314	-47663.93	0.0029270
155	49.21366	155.84	10.892	-42774.49	0.0030479
160	48.45414	150.18	10.480	-38404.88	0.0031746
165	47.67521	144.83	10.077	-34462.13	0.0033095
170	46.87493	139.69	9.682	-30878.73	0.0034554
175	46.05494	134.71	9.293	-27605.32	0.0036148
180	45.21047	129.83	8.913	-24605.15	0.0037907
185	44.34035	124.99	8.541	-21850.01	0.0039863
190	43.44199	120.18	8.176	-19317.35	0.0042055
195	42.51229	115.37	7.818	-16988.25	0.0044531
200	41.54751	110.53	7.467	-14846.21	0.0047357
205	40.54303	105.63	7.122	-12876.53	0.0050520
210	39.49303	100.65	6.781	-11066.15	0.0054444
215	38.39026	95.56	6.443	-9404.02	0.0058999
220	37.22434	90.34	6.106	-7881.63	0.0064532
225	35.98298	84.97	5.768	-6493.96	0.0071392
230	34.64900	79.45	5.427	-5240.58	0.0080069
235	33.20054	73.81	5.081	-4126.89	0.0091216
240	31.61143	68.14	4.730	-3165.03	0.0105560
245	29.85470	62.66	4.379	-2373.09	0.0123431
250	27.93008	57.74	4.040	-1768.64	0.0143482
260	23.80201	51.17	3.492	-1096.54	0.0171197
270	20.07703	40.18	3.183	-870.16	0.0164231
280	17.23715	49.91	3.041	-816.81	0.0139713
290	15.18099	52.03	2.958	-826.26	0.0115063
300	13.66843	54.83	2.902	-854.70	0.0095791
320	11.59675	61.18	2.821	-915.17	0.0070999
340	10.21994	67.79	2.753	-963.20	0.0056673
360	9.21345	74.37	2.710	-999.23	0.0047516
380	8.43452	80.87	2.668	-1026.50	0.0041166
400	7.80601	87.27	2.631	-1047.54	0.0036491
420	7.28384	93.57	2.600	-1064.07	0.0032991
440	6.84038	99.77	2.571	-1077.27	0.0030024
460	6.45731	105.89	2.547	-1087.94	0.0027690
480	6.12188	111.93	2.524	-1096.67	0.0025721
500	5.82486	117.89	2.504	-1103.86	0.0024056
520	5.55940	123.80	2.486	-1109.83	0.0022621
540	5.32029	129.65	2.469	-1114.82	0.0021369
560	5.10344	135.46	2.453	-1119.00	0.0020266
580	4.90563	141.22	2.439	-1122.52	0.0019284
600	4.72426	146.95	2.425	-1125.49	0.0018405
650	4.32967	161.15	2.395	-1131.04	0.0016556
700	4.00096	175.24	2.367	-1134.67	0.0015079
750	3.72201	189.29	2.342	-1137.00	0.0013967
800	3.48177	203.37	2.317	-1138.43	0.0012851
850	3.27232	217.52	2.293	-1139.23	0.0011986
900	3.08787	231.79	2.269	-1139.58	0.0011239
950	2.92400	246.19	2.245	-1139.60	0.0010596
1000	2.77733	260.74	2.221	-1139.39	0.0010010
1100	2.52548	290.37	2.174	-1138.53	0.0009037
1200	2.31659	320.70	2.128	-1137.32	0.0008246
1300	2.14055	351.69	2.083	-1135.95	0.0007588
1400	1.98781	383.26	2.041	-1134.53	0.0007031
1500	1.85925	415.32	2.002	-1133.11	0.0006553
2000	1.40179	580.31	1.851	-1126.86	0.0004906
2500	1.12601	748.32	1.758	-1122.18	0.0003730
3000	0.94122	916.42	1.698	-1118.72	0.0003280
3500	0.80864	1083.75	1.659	-1116.11	0.0002816

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1200 PSIA ISOPAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/BTU	V(DP/DV) PSIA	(DV/DT) / V P DEG. R
*116.905	54.37603	218.25	16.120	-110153.44	0.0021111
120	54.01593	213.26	15.139	-100530.69	0.0021334
125	53.41357	204.04	14.028	-87480.84	0.0023025
130	52.78641	194.66	13.253	-76823.93	0.0024217
135	52.13573	185.81	12.657	-67989.22	0.0025392
140	51.46314	177.73	12.156	-60544.29	0.0026544
145	50.77018	170.43	11.707	-54166.40	0.0027681
150	50.05808	163.81	11.285	-48615.98	0.0028822
155	49.32759	157.75	10.877	-43716.51	0.0029986
160	48.57896	152.13	10.479	-39338.92	0.0031197
165	47.81192	146.83	10.088	-35389.31	0.0032479
170	47.02576	141.76	9.704	-31799.44	0.0033856
175	46.21936	136.85	9.326	-28519.42	0.0035352
180	45.39127	132.05	8.956	-25512.17	0.0036991
185	44.53766	127.33	8.594	-22749.39	0.0038799
190	43.66239	122.64	8.238	-20209.56	0.0040809
195	42.75694	117.95	7.991	-17870.97	0.0043057
200	41.82031	113.26	7.550	-15720.40	0.0045594
205	40.84988	108.54	7.215	-13742.40	0.0048482
210	39.83823	103.77	6.886	-11924.11	0.0051809
215	38.78283	98.92	6.561	-10254.40	0.0055693
220	37.67569	93.99	6.240	-8724.29	0.0060292
225	36.50798	88.95	5.919	-7327.61	0.0065822
230	35.26853	83.82	5.599	-6061.74	0.0072566
235	33.94374	78.61	5.277	-4928.31	0.0080872
240	32.51815	73.39	4.955	-3933.69	0.0091099
245	30.97720	68.30	4.634	-3088.36	0.0103431
250	29.31458	63.55	4.321	-2403.83	0.0117416
260	25.71912	56.25	3.771	-1522.29	0.0142309
270	22.20691	52.82	3.402	-1137.35	0.0147487
280	19.26487	52.34	3.196	-996.43	0.0134828
290	16.99059	53.57	3.079	-959.31	0.0116217
300	15.26224	55.78	3.003	-965.07	0.0098832
320	12.86816	61.50	2.900	-1011.20	0.0073886
340	11.28330	67.84	2.827	-1057.95	0.0058742
360	10.13753	74.31	2.769	-1095.48	0.0048987
380	9.25714	80.76	2.721	-1124.66	0.0042240
400	8.55138	87.15	2.679	-1147.45	0.0037297
420	7.96905	93.45	2.644	-1165.48	0.0033512
440	7.47470	99.69	2.612	-1179.92	0.0030512
460	7.04996	105.82	2.584	-1191.62	0.0028069
480	6.67906	111.89	2.559	-1201.19	0.0026035
500	6.35139	117.89	2.537	-1209.08	0.0024313
520	6.05911	123.83	2.517	-1215.63	0.0022833
540	5.79627	129.72	2.498	-1221.10	0.0021545
560	5.55824	135.56	2.481	-1225.68	0.0020412
580	5.34137	141.36	2.465	-1229.52	0.0019407
600	5.14273	147.12	2.450	-1232.76	0.0018509
650	4.71124	161.40	2.417	-1238.80	0.0016622
700	4.35238	175.57	2.387	-1242.71	0.0015121
750	4.04825	189.69	2.360	-1245.18	0.0013893
800	3.78656	203.84	2.334	-1246.66	0.0012867
850	3.55858	218.05	2.309	-1247.43	0.0011994
900	3.35791	232.37	2.283	-1247.71	0.0011241
950	3.17972	246.82	2.258	-1247.64	0.0010584
1000	3.02028	261.43	2.233	-1247.31	0.0010005
1100	2.74659	291.14	2.184	-1246.15	0.0009029
1200	2.51276	321.55	2.137	-1244.63	0.0009236
1300	2.32844	352.60	2.091	-1242.95	0.0007577
1400	2.16471	384.23	2.049	-1241.22	0.0007020
1500	2.02289	416.35	2.009	-1239.51	0.0006543
2000	1.52522	581.55	1.856	-1232.00	0.0004898
2500	1.22617	749.69	1.751	-1226.42	0.0003723
3000	1.02522	917.87	1.701	-1222.30	0.0003276
3500	0.88099	1085.25	1.641	-1219.18	0.0002813

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1300 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DV)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
* 117.172	54.39499	220.18	15.838	-110397.37	0.0020900
120	54.06939	215.53	14.977	-101641.51	0.0021550
125	53.47429	206.22	13.899	-88545.88	0.0022721
130	52.85470	196.74	13.150	-77855.57	0.0023894
135	52.21190	187.91	12.576	-68992.68	0.0025047
140	51.54753	179.67	12.095	-61574.94	0.0026174
145	50.96318	172.34	11.653	-55129.17	0.0027294
150	50.16016	165.71	11.256	-49564.98	0.0028390
155	49.43936	159.66	10.863	-44654.86	0.0029512
160	48.70116	154.06	10.478	-40268.72	0.0030672
165	47.94547	148.80	10.099	-36311.75	0.0031893
170	47.17177	143.79	9.726	-32714.96	0.0032197
175	46.37917	138.95	9.358	-29427.91	0.0034603
180	45.56645	134.24	8.999	-26413.19	0.0036134
185	44.73211	129.61	8.644	-23642.32	0.0037813
190	43.87437	125.02	8.298	-21092.80	0.0039564
195	42.99115	120.47	7.960	-18746.06	0.0041716
200	42.08906	115.91	7.628	-16586.10	0.0044009
205	41.13924	111.35	7.303	-14598.71	0.0046598
210	40.16228	106.76	6.985	-12771.19	0.0049516
215	39.14805	102.12	6.671	-11092.37	0.0052875
220	38.09046	97.43	6.362	-9552.95	0.0056772
225	36.98329	92.67	6.055	-8145.91	0.0061345
230	35.81997	87.85	5.752	-6867.06	0.0066766
235	34.59864	82.99	5.449	-5715.55	0.0073235
240	33.28264	78.13	5.149	-4693.99	0.0080943
245	31.89210	73.37	4.851	-3808.15	0.0089987
250	30.41253	68.85	4.559	-3065.10	0.0100178
260	27.22936	61.33	4.027	-2017.82	0.0120316
270	23.99316	56.89	3.623	-1472.88	0.0130153
280	21.09037	55.35	3.367	-1229.67	0.0125791
290	18.70564	55.71	3.212	-1132.03	0.0113463
300	16.81821	57.26	3.113	-1103.16	0.0099310
320	14.13647	62.20	2.985	-1120.85	0.0075852
340	12.34934	68.18	2.898	-1160.45	0.0060423
360	11.06277	74.47	2.830	-1196.86	0.0050255
380	10.07991	80.83	2.775	-1226.62	0.0043190
400	9.29588	87.19	2.729	-1250.40	0.0038021
420	8.65073	93.47	2.688	-1269.44	0.0034073
440	8.10703	99.70	2.653	-1284.79	0.0030954
460	7.64032	105.85	2.622	-1297.27	0.0028422
480	7.23375	111.94	2.595	-1307.51	0.0026321
500	6.87531	117.97	2.570	-1315.96	0.0024547
520	6.55614	123.94	2.548	-1322.98	0.0023075
540	6.26954	129.85	2.528	-1328.83	0.0021704
560	6.01032	135.72	2.509	-1333.73	0.0020545
580	5.77441	141.55	2.492	-1337.84	0.0019517
600	5.55854	147.34	2.476	-1341.30	0.0018600
650	5.09025	161.70	2.439	-1347.71	0.0016682
700	4.70140	175.94	2.407	-1351.82	0.0015159
750	4.37222	190.13	2.378	-1354.36	0.0013916
800	4.08923	204.33	2.350	-1355.83	0.0012879
850	3.84286	218.60	2.323	-1356.54	0.0011999
900	3.62611	232.97	2.297	-1356.71	0.0011241
950	3.43371	247.47	2.271	-1356.50	0.0010581
1000	3.26162	262.12	2.246	-1356.01	0.0009999
1100	2.96629	291.93	2.195	-1354.52	0.0009920
1200	2.72159	322.40	2.146	-1352.64	0.0008225
1300	2.51522	353.52	2.100	-1350.60	0.0007566
1400	2.32862	385.21	2.056	-1348.53	0.0007009
1500	2.18566	417.39	2.016	-1346.49	0.0006531
2000	1.64751	582.79	1.860	-1337.60	0.0004899
2500	1.32597	751.06	1.764	-1331.03	0.0003917
3000	1.10897	919.31	1.703	-1326.19	0.0003271
3500	0.95316	1086.75	1.663	-1322.52	0.0002809

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1400 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB P	PSIA-CU FT/BTU V	PSIA T	DEG. R P
*117.438	54.41401	222.11	15.569	-110650.10	0.0020691
120	54.12232	217.82	14.820	-102745.18	0.0021271
125	53.53436	208.41	13.775	-89611.33	0.0022424
130	52.92219	198.82	13.051	-78887.06	0.0023578
135	52.28709	189.81	12.498	-69935.34	0.0024711
140	51.63072	181.61	12.016	-62504.09	0.0025316
145	50.95473	174.23	11.620	-56099.74	0.0026899
150	50.26051	167.59	11.229	-50511.11	0.0027973
155	49.54905	161.54	10.850	-45589.73	0.0029057
160	48.82088	155.96	10.477	-41194.50	0.0030171
165	48.07605	150.74	10.109	-37229.70	0.0031336
170	47.31421	145.79	9.747	-33625.59	0.0032572
175	46.53466	141.02	9.389	-30331.16	0.0033898
180	45.73642	136.38	9.038	-27308.61	0.0035332
185	44.91923	131.84	8.693	-24529.29	0.0036895
190	44.07863	127.36	8.355	-21970.66	0.0038606
195	43.21592	122.91	8.026	-19614.26	0.0040490
200	42.32814	118.49	7.703	-17444.25	0.0042573
205	41.41305	114.06	7.386	-15446.65	0.0044893
210	40.46801	109.63	7.077	-13608.88	0.0047495
215	39.49989	105.18	6.773	-11919.82	0.0050436
220	38.47495	100.69	6.475	-10369.89	0.0053790
225	37.41972	96.16	6.181	-8951.48	0.0057648
230	36.31597	91.60	5.890	-7659.29	0.0062119
235	35.16073	87.03	5.603	-6490.66	0.0067323
240	33.94678	82.47	5.319	-5445.73	0.0073369
245	32.66951	77.99	5.039	-4527.06	0.0080307
250	31.32300	73.69	4.765	-3738.61	0.0088040
260	28.45177	66.22	4.255	-2560.54	0.0104025
270	25.48446	61.15	3.839	-1868.16	0.0114743
280	22.69606	58.72	3.546	-1514.19	0.0115368
290	20.28671	58.30	3.356	-1345.78	0.0108165
300	18.30149	59.20	3.231	-1272.54	0.0097544
320	15.38507	63.28	3.073	-1247.45	0.0076786
340	13.40890	68.79	2.971	-1272.74	0.0061646
360	11.98463	74.84	2.893	-1304.64	0.0051288
380	10.89970	81.08	2.831	-1333.21	0.0044001
400	10.03761	87.36	2.779	-1356.98	0.0038652
420	9.33052	93.62	2.734	-1376.39	0.0034568
440	8.73637	99.93	2.695	-1392.22	0.0031347
460	8.22761	105.99	2.661	-1405.19	0.0028738
480	7.78536	112.09	2.631	-1415.86	0.0026578
500	7.39615	118.13	2.604	-1424.70	0.0024757
520	7.05011	124.12	2.579	-1432.04	0.0023198
540	6.73979	130.06	2.557	-1438.17	0.0021847
560	6.45944	135.95	2.537	-1443.29	0.0020664
580	6.20455	141.80	2.518	-1447.59	0.0019617
600	5.97151	147.62	2.501	-1451.19	0.0018683
650	5.46659	162.04	2.462	-1457.84	0.0016735
700	5.04703	176.34	2.428	-1462.04	0.0015192
750	4.69388	190.59	2.396	-1464.58	0.0013936
800	4.38975	204.85	2.367	-1465.98	0.0012889
850	4.12514	219.18	2.339	-1466.57	0.0012003
900	3.89245	233.59	2.311	-1466.59	0.0011240
950	3.68598	248.14	2.284	-1466.20	0.0010576
1000	3.50134	262.84	2.258	-1465.53	0.0009992
1100	3.18457	292.72	2.206	-1463.63	0.0009010
1200	2.92218	323.27	2.156	-1461.35	0.0008214
1300	2.70990	354.45	2.108	-1458.91	0.0007554
1400	2.51155	386.20	2.064	-1456.45	0.0006997
1500	2.34754	418.43	2.023	-1454.05	0.0006520
2000	1.77256	584.03	1.865	-1443.66	0.0004881
2500	1.42541	752.43	1.767	-1436.02	0.0003711
3000	1.19246	920.76	1.706	-1430.39	0.0003266
3500	1.02513	1088.25	1.665	-1426.13	0.0002805

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1500 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*117.704	54.43337	224.05	15.312	-110911.40	0.0020486
120	54.17474	220.13	14.668	-103849.75	0.0020997
125	53.59378	210.60	13.653	-90677.27	0.0027133
130	52.98848	200.91	12.954	-79918.48	0.0023269
135	52.36132	191.81	12.422	-70997.30	0.0024383
140	51.71275	183.54	11.978	-63491.87	0.0025467
145	51.04488	176.12	11.579	-57049.25	0.0026525
150	50.35919	169.45	11.202	-51454.54	0.0027570
155	49.65676	163.41	10.835	-46521.31	0.0028619
160	48.93823	157.85	10.476	-42116.47	0.0029690
165	48.20379	152.67	10.120	-38143.40	0.0030803
170	47.45326	147.76	9.767	-34531.59	0.0031978
175	46.68610	143.05	9.419	-31229.45	0.0033231
180	45.90152	138.49	9.077	-28198.79	0.0034579
185	45.09850	134.03	8.741	-25410.72	0.0036038
190	44.27531	129.64	8.411	-22842.66	0.0037626
195	43.43207	125.29	8.089	-20476.19	0.0039361
200	42.56571	120.98	7.774	-18295.64	0.0041266
205	41.67493	116.69	7.465	-16287.18	0.0043366
210	40.75769	112.40	7.164	-14438.41	0.0045696
215	39.81160	108.10	6.869	-12738.22	0.0048299
220	38.83399	103.80	6.580	-11176.89	0.0051221
225	37.82133	99.47	6.297	-9746.36	0.0054529
230	36.77023	95.14	6.017	-8440.51	0.0058292
235	35.67653	90.80	5.743	-7255.40	0.0062585
240	34.53609	86.49	5.472	-6189.38	0.0067471
245	33.34535	82.25	5.207	-5242.80	0.0072977
250	32.10247	78.17	4.947	-4417.36	0.0079045
260	29.47306	70.86	4.459	-3133.98	0.0091824
270	26.74064	65.43	4.042	-2312.07	0.0101883
280	24.09585	62.33	3.725	-1846.01	0.0105136
290	21.71908	61.21	3.505	-1599.49	0.0101645
300	19.68912	61.50	3.355	-1474.41	0.0094186
320	16.59830	64.68	3.166	-1393.62	0.0076707
340	14.45372	69.67	3.047	-1336.80	0.0062370
360	12.89845	75.43	2.958	-1420.10	0.0052059
380	11.71395	81.50	2.888	-1445.31	0.0044659
400	10.77455	87.68	2.830	-1467.79	0.0039184
420	10.00698	93.89	2.780	-1486.79	0.0034995
440	9.36173	100.07	2.737	-1502.58	0.0031690
460	8.81110	106.22	2.700	-1515.65	0.0029016
480	8.33329	112.32	2.667	-1526.48	0.0026304
500	7.91344	118.37	2.638	-1535.48	0.0024943
520	7.54065	124.37	2.611	-1542.98	0.0023352
540	7.20672	130.33	2.587	-1549.24	0.0021975
560	6.90524	136.24	2.565	-1554.47	0.0020769
580	6.63157	142.11	2.545	-1558.86	0.0019705
600	6.38147	147.95	2.526	-1562.52	0.0018757
650	5.84017	162.42	2.485	-1569.25	0.0016781
700	5.39191	176.78	2.448	-1573.43	0.0015220
750	5.01319	191.09	2.415	-1575.88	0.0013952
800	4.68810	205.40	2.384	-1577.14	0.0012897
850	4.40541	219.77	2.354	-1577.55	0.0012004
900	4.15693	234.24	2.325	-1577.37	0.0011237
950	3.93651	248.83	2.297	-1576.76	0.0010571
1000	3.73944	263.57	2.270	-1575.86	0.0009984
1100	3.40145	293.53	2.216	-1573.51	0.0009000
1200	3.12152	324.14	2.165	-1570.76	0.0008203
1300	2.89548	355.39	2.117	-1567.88	0.0007543
1400	2.68350	387.20	2.071	-1565.00	0.0006986
1500	2.50255	419.48	2.029	-1562.20	0.0006509
2000	1.89597	585.27	1.869	-1550.18	0.0004872
2500	1.52450	753.90	1.771	-1541.38	0.0003904
3000	1.27570	922.21	1.709	-1534.90	0.0003261
3500	1.09692	1089.75	1.668	-1530.01	0.0002802

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1600 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DU) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*117.969	54.45297	225.99	15.066	-111181.07	0.0020283
120	54.22666	222.46	14.519	-104955.25	0.0020729
125	53.65257	212.81	13.535	-91743.74	0.0021347
130	53.05480	203.01	12.959	-80949.93	0.0022966
135	52.42460	193.81	12.348	-71939.67	0.0024063
140	51.79365	185.47	11.922	-64458.39	0.0025128
145	51.13369	178.00	11.539	-58004.86	0.0026164
150	50.45627	171.31	11.177	-52375.44	0.0027181
155	49.76256	165.26	10.824	-47449.78	0.0028197
160	49.05331	159.72	10.476	-43034.84	0.0029229
165	48.32884	154.57	10.130	-39053.08	0.0030295
170	47.58911	149.71	9.787	-35433.23	0.0031414
175	46.83373	145.05	9.449	-32123.08	0.0032600
180	46.06208	140.56	9.115	-29084.05	0.0033870
185	45.27332	136.17	8.786	-26286.99	0.0035236
190	44.46646	131.87	8.464	-23709.24	0.0036714
195	43.64036	127.62	8.149	-21332.39	0.0038319
200	42.79375	123.41	7.842	-19140.91	0.0040068
205	41.92521	119.24	7.541	-17121.12	0.0041931
210	41.03314	115.07	7.247	-15260.76	0.0044032
215	40.11573	110.92	6.960	-13548.77	0.0046403
220	39.17092	106.78	6.679	-11975.36	0.0048979
225	38.19635	102.63	6.404	-10532.13	0.0051853
230	37.18942	98.48	6.135	-9212.38	0.0055072
235	36.14732	94.35	5.870	-8011.21	0.0058683
240	35.06730	90.25	5.611	-6925.66	0.0062726
245	33.94707	86.23	5.357	-5954.49	0.0067213
250	32.78557	82.33	5.110	-5097.70	0.0072104
260	30.34737	75.23	4.642	-3727.28	0.0082470
270	27.81333	69.64	4.230	-2793.59	0.0091398
280	25.31630	66.04	3.900	-2219.84	0.0099812
290	23.00529	64.33	3.657	-1890.96	0.0094817
300	20.97062	64.07	3.484	-1708.35	0.0089909
320	17.76350	66.38	3.263	-1561.04	0.0075748
340	15.47600	70.80	3.125	-1534.30	0.0062593
360	13.79969	76.22	3.025	-1544.47	0.0052556
380	12.51973	82.09	2.946	-1563.75	0.0045155
400	11.50513	88.15	2.881	-1583.44	0.0039613
420	10.67608	94.28	2.827	-1601.08	0.0035351
440	9.98215	100.42	2.780	-1616.18	0.0031982
460	9.39006	106.55	2.740	-1628.91	0.0029255
480	8.87701	112.64	2.704	-1639.57	0.0027001
500	8.42675	118.69	2.672	-1648.49	0.0025105
520	8.02741	124.70	2.643	-1655.94	0.0023486
540	7.67005	130.66	2.617	-1662.18	0.0022086
560	7.34791	136.59	2.594	-1667.39	0.0020862
580	7.05531	142.47	2.572	-1671.75	0.0019782
600	6.78827	148.33	2.552	-1675.39	0.0018821
650	6.21089	162.85	2.507	-1682.02	0.0016821
700	5.73328	177.26	2.468	-1686.05	0.0015244
750	5.33011	191.61	2.433	-1688.31	0.0013964
800	4.98425	205.98	2.401	-1689.34	0.0012702
850	4.68365	220.39	2.370	-1689.51	0.0012004
900	4.41952	234.90	2.340	-1689.07	0.0011233
950	4.18529	249.54	2.311	-1688.20	0.0010564
1000	3.97593	264.31	2.282	-1687.04	0.0009976
1100	3.61691	294.34	2.227	-1684.15	0.0008989
1200	3.31963	325.03	2.174	-1680.89	0.0008191
1300	3.06897	356.34	2.125	-1677.51	0.0007531
1400	2.85449	388.20	2.079	-1674.17	0.0006974
1500	2.66870	420.53	2.036	-1670.94	0.0006498
2000	2.01706	586.52	1.873	-1657.16	0.0004864
2500	1.62322	755.17	1.774	-1647.11	0.0003898
3000	1.35869	923.66	1.711	-1639.73	0.0003257
3500	1.16852	1091.25	1.670	-1634.17	0.0002798

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1700 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(OP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*118.234	54.47280	227.93	14.831	-111458.92	0.0020083
120	54.27808	224.80	14.375	-106061.73	0.0020465
125	53.71074	215.03	13.419	-97810.80	0.0021567
130	53.11497	205.11	12.767	-81981.46	0.0022671
135	52.50698	195.81	12.276	-72999.55	0.0023751
140	51.87346	187.39	11.867	-65433.79	0.0024798
145	51.22121	179.87	11.500	-58959.69	0.0025812
150	50.55191	173.16	11.152	-53333.94	0.0026405
155	49.86653	167.10	10.812	-48375.31	0.0027790
160	49.16623	161.57	10.475	-43949.79	0.0028786
165	48.45133	156.45	10.140	-39958.93	0.0029809
170	47.72192	151.63	9.807	-36330.71	0.0030876
175	46.97776	147.03	9.477	-33012.30	0.0032002
180	46.21836	142.59	9.151	-29964.69	0.0033200
185	45.44307	138.28	8.830	-27158.43	0.0034483
190	44.65106	134.05	8.516	-24570.78	0.0035863
195	43.84142	129.90	8.203	-22183.33	0.0037353
200	43.01312	125.79	7.907	-19980.62	0.0038965
205	42.16503	121.71	7.613	-17949.14	0.0040716
210	41.29591	117.67	7.326	-16076.75	0.0042623
215	40.40439	113.65	7.046	-14352.46	0.0044709
220	39.48894	109.64	6.772	-12756.44	0.0046999
225	38.54784	105.65	6.505	-11310.08	0.0049524
230	37.57925	101.67	6.244	-9976.23	0.0052315
235	36.58125	97.71	5.989	-8759.29	0.0055402
240	35.55199	93.80	5.739	-7655.31	0.0058810
245	34.49005	89.96	5.495	-6661.86	0.0062544
250	33.39437	86.23	5.257	-5777.67	0.0066575
260	31.11139	79.36	4.806	-4333.43	0.0075118
270	28.74366	73.72	4.403	-3303.41	0.0082877
280	26.38606	69.78	4.068	-2629.58	0.0089528
290	24.15794	67.58	3.807	-2217.29	0.0094204
300	22.14512	66.84	3.615	-1973.07	0.0099234
320	18.87191	68.32	3.363	-1750.47	0.0074105
340	16.46902	72.15	3.205	-1686.56	0.0062350
360	14.68408	77.20	3.093	-1678.84	0.0052778
380	13.31432	82.83	3.005	-1689.34	0.0045484
400	12.22724	88.75	2.934	-1704.52	0.0039935
420	11.33928	94.79	2.874	-1719.69	0.0035633
440	10.59670	100.88	2.824	-1733.39	0.0032221
460	9.96380	106.97	2.779	-1745.25	0.0029454
480	9.41597	113.04	2.741	-1755.36	0.0027167
500	8.93567	119.08	2.706	-1763.90	0.0025242
520	8.51007	125.09	2.675	-1771.09	0.0023400
540	8.12952	131.06	2.647	-1777.12	0.0022181
560	7.78663	136.99	2.622	-1782.16	0.0020961
580	7.47558	142.89	2.599	-1786.38	0.0019847
600	7.19177	148.76	2.577	-1789.88	0.0018875
650	6.57865	163.32	2.530	-1796.20	0.0016854
700	6.07198	177.77	2.489	-1799.93	0.0015263
750	5.64460	192.17	2.451	-1801.89	0.0013974
800	5.27818	206.57	2.417	-1802.61	0.0012905
850	4.95985	221.03	2.385	-1802.47	0.0012002
900	4.68023	235.58	2.354	-1801.71	0.0011228
950	4.43233	250.26	2.324	-1800.53	0.0010556
1000	4.21079	265.07	2.294	-1799.06	0.0009966
1100	3.83097	295.17	2.238	-1795.56	0.0008978
1200	3.51651	325.92	2.194	-1791.73	0.0008179
1300	3.25138	357.29	2.133	-1787.82	0.0007519
1400	3.02451	389.20	2.086	-1783.97	0.0006962
1500	2.82798	421.58	2.043	-1780.27	0.0006486
2000	2.13951	587.77	1.878	-1764.60	0.0004855
2500	1.72160	756.54	1.777	-1753.22	0.0003392
3000	1.44142	925.11	1.714	-1744.88	0.0003252
3500	1.23993	1092.75	1.672	-1738.59	0.0002794

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1400 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*118.498	54.49295	229.88	14.606	-111744.76	0.0017885
120	54.37931	227.16	14.234	-107169.22	0.0020206
125	53.76932	217.26	13.307	-93878.51	0.0021293
130	53.18440	207.22	12.678	-83013.17	0.0022382
135	52.67847	197.81	12.205	-74000.02	0.0023447
140	51.95221	189.31	11.814	-66408.16	0.0024476
145	51.30746	181.74	11.462	-59912.87	0.0025471
150	50.64586	174.99	11.129	-54270.21	0.0026440
155	49.96875	168.93	10.800	-49298.07	0.0027398
160	49.27708	163.41	10.475	-44861.50	0.0028360
165	48.57139	158.31	10.150	-40861.17	0.0029343
170	47.85186	153.52	9.826	-37224.26	0.0030363
175	47.11840	148.97	9.505	-33897.34	0.0031433
180	46.37064	144.60	9.187	-30840.93	0.0032566
185	45.60908	140.35	8.873	-28025.33	0.0033774
190	44.83704	136.20	8.565	-25427.62	0.0035066
195	44.03590	132.12	8.264	-23029.40	0.0036453
200	43.22453	128.10	7.969	-20815.26	0.0037945
205	42.39534	124.13	7.682	-18771.82	0.0039555
210	41.54727	120.19	7.401	-16887.06	0.0041295
215	40.67928	116.28	7.127	-15150.10	0.0043182
220	39.79025	112.40	6.861	-13551.08	0.0045235
225	38.87895	108.55	6.600	-12081.26	0.0047474
230	37.94407	104.71	6.346	-10733.15	0.0049921
235	36.98432	100.92	6.093	-9500.64	0.0052596
240	35.99849	97.17	5.857	-8379.04	0.0055513
245	34.98574	93.49	5.621	-7364.99	0.0058573
250	33.94585	89.91	5.392	-6456.25	0.0062055
260	31.79016	83.26	4.956	-4947.93	0.0069203
270	29.56234	77.65	4.563	-3834.28	0.0075906
280	27.33120	73.49	4.225	-3069.17	0.0080571
290	25.18957	70.91	3.954	-2575.04	0.0082071
300	23.21773	69.74	3.745	-2266.79	0.0080512
320	19.91871	70.45	3.464	-1961.95	0.0071986
340	17.42746	73.71	3.287	-1854.43	0.0061700
360	15.56785	78.35	3.162	-1824.13	0.0052736
380	14.09521	83.73	3.065	-1822.83	0.0045649
400	12.93927	89.48	2.987	-1831.58	0.0040150
420	11.99445	95.41	2.923	-1843.06	0.0035343
440	11.20452	101.43	2.867	-1854.51	0.0032408
460	10.53167	107.47	2.820	-1864.93	0.0029615
480	9.94957	113.52	2.778	-1874.06	0.0027302
500	9.43980	119.54	2.741	-1881.90	0.0025356
520	8.98831	125.54	2.708	-1888.56	0.0023675
540	8.58498	131.51	2.678	-1894.18	0.0022260
560	8.22159	137.45	2.651	-1898.89	0.0021007
580	7.89221	143.35	2.626	-1902.82	0.0019902
600	7.59183	149.23	2.603	-1906.07	0.0018920
650	6.94337	163.82	2.552	-1911.85	0.0016881
700	6.40795	178.31	2.507	-1915.13	0.0015278
750	5.95662	192.75	2.470	-1916.66	0.0013780
800	5.56986	207.20	2.434	-1916.98	0.0012905
850	5.23399	221.70	2.400	-1916.45	0.0011998
900	4.93905	236.29	2.368	-1915.32	0.0011221
950	4.67763	250.99	2.337	-1913.77	0.0010547
1000	4.44404	265.35	2.307	-1911.94	0.0009956
1100	4.04362	296.01	2.248	-1907.77	0.0008966
1200	3.71216	326.83	2.193	-1903.30	0.0008167
1300	3.43270	358.25	2.142	-1898.80	0.0007506
1400	3.19357	390.22	2.094	-1894.40	0.0006950
1500	2.98641	422.65	2.050	-1890.19	0.0006475
2000	2.25744	589.02	1.892	-1872.50	0.0004346
2500	1.81962	757.92	1.780	-1859.71	0.0003886
3000	1.52391	926.57	1.716	-1850.34	0.0003247
3500	1.31116	1094.25	1.674	-1843.29	0.0002791

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1900 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*118.762	54.51311	231.82	14.390	-112038.39	0.0019691
120	54.37047	229.54	14.096	-108277.76	0.0019952
125	53.82530	219.51	13.197	-94946.93	0.0021024
130	53.24911	209.33	12.590	-84045.10	0.0022099
135	52.66909	199.81	12.137	-75000.18	0.0023149
140	52.02974	191.23	11.762	-67381.62	0.0024163
145	51.39249	183.60	11.475	-60864.53	0.0025140
150	50.73847	176.92	11.105	-55204.38	0.0026087
155	50.06927	170.74	10.789	-50218.20	0.0027019
160	49.39594	165.23	10.475	-45770.13	0.0027950
165	48.68911	160.15	10.160	-41759.95	0.0028896
170	47.97907	155.39	9.845	-39114.06	0.0029972
175	47.25582	150.89	9.532	-34778.41	0.0030892
180	46.51915	146.57	9.221	-31713.04	0.0031966
185	45.76964	142.38	8.915	-28857.96	0.0033105
190	45.00379	138.30	8.614	-26280.08	0.0034318
195	44.22400	134.30	8.318	-23870.95	0.0035613
200	43.42863	130.37	8.030	-21645.24	0.0036998
205	42.61698	126.48	7.748	-19589.64	0.0038484
210	41.78831	122.64	7.473	-17692.28	0.0040080
215	40.94184	118.84	7.205	-15942.36	0.0041797
220	40.07677	115.07	6.944	-14330.04	0.0043649
225	39.19222	111.34	6.690	-12846.52	0.0045651
230	38.28731	107.64	6.443	-11484.05	0.0047817
235	37.36116	103.98	6.201	-10236.13	0.0050160
240	36.41304	100.38	5.966	-9097.50	0.0052690
245	35.44349	96.84	5.738	-8064.11	0.0055403
250	34.44955	93.41	5.516	-7132.93	0.0058283
260	32.40132	86.97	5.094	-5567.82	0.0064345
270	30.29217	81.43	4.709	-4390.81	0.0070142
280	28.17369	77.13	4.374	-3533.10	0.0074525
290	26.11858	74.76	4.095	-2960.53	0.0076518
300	24.19666	72.72	3.874	-2587.40	0.0075952
320	20.90238	72.74	3.567	-2195.01	0.0069575
340	18.34758	75.44	3.370	-2038.39	0.0060720
360	16.38784	79.67	3.232	-1981.05	0.0052455
380	14.86015	84.77	3.126	-1964.85	0.0045655
400	13.63766	90.33	3.041	-1965.14	0.0040258
420	12.64050	96.14	2.971	-1971.58	0.0035979
440	11.80490	102.08	2.911	-1979.86	0.0032542
460	11.09305	108.07	2.860	-1988.19	0.0029736
480	10.47765	114.07	2.815	-1995.86	0.0027408
500	9.93877	120.08	2.775	-2002.64	0.0025447
520	9.46185	126.06	2.740	-2008.50	0.0023772
540	9.03590	132.02	2.708	-2013.48	0.0022324
560	8.65250	137.96	2.679	-2017.67	0.0021060
580	8.30506	143.87	2.653	-2021.16	0.0019946
600	7.98833	149.75	2.629	-2024.04	0.0018956
650	7.30498	164.37	2.575	-2029.04	0.0016902
700	6.74116	178.89	2.529	-2031.68	0.0015288
750	6.26615	193.36	2.488	-2032.66	0.0013383
800	5.85928	207.84	2.451	-2032.48	0.0012903
850	5.50606	222.38	2.416	-2031.47	0.0011993
900	5.19598	237.00	2.382	-2029.90	0.0011213
950	4.92117	251.75	2.350	-2027.93	0.0010537
1000	4.67567	266.63	2.319	-2025.69	0.0009945
1100	4.25439	296.87	2.259	-2020.77	0.0008954
1200	3.90659	327.74	2.203	-2015.60	0.0008154
1300	3.61294	359.22	2.150	-2010.46	0.0007494
1400	3.36167	391.24	2.101	-2005.47	0.0006938
1500	3.14397	423.71	2.056	-2000.72	0.0006463
2000	2.37984	590.28	1.887	-1980.86	0.0004338
2500	1.91728	759.29	1.784	-1966.57	0.0003879
3000	1.60614	928.02	1.719	-1956.12	0.0003242
3500	1.38220	1095.75	1.676	-1948.25	0.0002787

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

2000 PSIA ISORAP

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DV)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*119.025	54.53358	233.77	14.184	-112339.64	0.0019499
120	54.42946	231.93	13.962	-109387.38	0.0019702
125	53.88170	221.76	13.090	-96016.10	0.0020760
130	53.31112	211.45	12.505	-85077.35	0.0021922
135	52.71837	201.82	12.070	-76000.10	0.0022859
140	52.10666	193.15	11.712	-68354.26	0.0023858
145	51.47634	185.45	11.390	-61814.79	0.0024317
150	50.82949	178.63	11.082	-56136.58	0.0025745
155	50.16818	172.54	10.779	-51135.86	0.0026652
160	49.49290	167.03	10.475	-46675.85	0.0027555
165	48.80460	161.95	10.169	-42655.46	0.0028467
170	48.10367	157.24	9.863	-39000.31	0.0029403
175	47.39020	152.78	9.558	-35655.71	0.0030376
180	46.66409	148.51	9.255	-32581.23	0.0031396
185	45.92503	144.33	8.955	-29746.56	0.0032472
190	45.17765	140.37	8.660	-27128.42	0.0033613
195	44.40647	136.44	8.371	-24708.31	0.0034826
200	43.62598	132.58	8.089	-22470.91	0.0036117
205	42.83056	128.78	7.812	-20403.03	0.0037493
210	42.01935	125.03	7.542	-18492.90	0.0038762
215	41.19328	121.33	7.290	-16729.81	0.0040533
220	40.35007	117.67	7.024	-15104.00	0.0042214
225	39.48973	114.04	6.776	-13606.58	0.0044017
230	38.61148	110.46	6.534	-12229.68	0.0045950
235	37.71537	106.93	6.298	-10966.48	0.0048022
240	36.80040	103.45	6.069	-9811.28	0.0050239
245	35.86657	100.05	5.847	-8759.50	0.0052596
250	34.91412	96.73	5.631	-7807.48	0.0055080
260	32.95767	90.50	5.221	-6191.17	0.0060292
270	30.95017	85.05	4.845	-4939.02	0.0065317
280	28.93135	80.68	4.513	-4016.66	0.0069343
290	26.95860	77.59	4.230	-3370.07	0.0071557
300	25.09126	75.76	3.999	-2932.58	0.0071667
320	21.82388	75.14	3.669	-2448.90	0.0067017
340	19.22717	77.31	3.455	-2238.53	0.0059489
360	17.20162	81.14	3.303	-2150.09	0.0051963
380	15.60723	85.94	3.188	-2115.94	0.0045512
400	14.32790	91.31	3.095	-2105.66	0.0040266
420	13.27640	96.98	3.020	-2105.63	0.0036044
440	12.30677	102.81	2.956	-2109.75	0.0032625
460	11.64738	108.74	2.901	-2115.27	0.0029819
480	10.99947	114.70	2.853	-2120.97	0.0027484
500	10.43225	120.67	2.810	-2126.29	0.0025514
520	9.93041	126.64	2.773	-2131.03	0.0023929
540	9.49236	132.59	2.739	-2135.13	0.0022373
560	9.07920	138.52	2.708	-2138.61	0.0021101
580	8.71398	144.43	2.680	-2141.50	0.0019980
600	8.38114	150.32	2.654	-2143.86	0.0018984
650	7.66339	164.95	2.598	-2147.82	0.0016917
700	7.07154	179.50	2.550	-2149.64	0.0015294
750	6.57316	194.00	2.507	-2149.93	0.0013983
800	6.14642	208.51	2.468	-2149.13	0.0012899
850	5.77606	223.08	2.431	-2147.57	0.0011985
900	5.45100	237.74	2.396	-2145.48	0.0011204
950	5.16297	252.52	2.363	-2143.02	0.0010527
1000	4.90558	267.44	2.331	-2140.33	0.0009933
1100	4.46475	297.73	2.270	-2134.57	0.0008941
1200	4.09980	328.66	2.212	-2128.64	0.0008141
1300	3.79212	360.19	2.158	-2122.80	0.0007481
1400	3.52882	392.26	2.109	-2117.18	0.0006926
1500	3.30069	424.79	2.063	-2111.85	0.0006452
2000	2.49972	591.54	1.891	-2089.69	0.0004929
2500	2.01460	760.67	1.787	-2073.81	0.0003873
3000	1.68812	929.48	1.721	-2062.22	0.0003238
3500	1.45305	1097.26	1.678	-2053.49	0.0002783

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

2500 PSIA ISOBAR

TEMPERATURE	DENSITY	V(CP/DV) P	V(CP/DU) V	V(CP/DV) T	(DV/DT) /V P
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*120.335	54.63977	243.49	13.273	-113954.00	0.0018580
125	54.15543	233.22	12.591	-101374.81	0.0019513
130	53.61615	222.16	12.107	-90245.29	0.0020517
135	53.05595	211.87	11.759	-80999.00	0.0021498
140	52.47618	202.69	11.479	-73208.53	0.0022437
145	51.87910	194.63	11.224	-66548.75	0.0023328
150	51.26654	187.58	10.979	-60772.23	0.0024175
155	50.64025	181.35	10.731	-55691.53	0.0024986
160	50.00165	175.81	10.477	-51165.60	0.0025774
165	49.35194	170.80	10.216	-47089.08	0.0026549
170	48.69159	166.19	9.950	-43393.71	0.0027326
175	48.02141	161.89	9.691	-39991.56	0.0028114
180	47.34158	157.83	9.411	-36869.66	0.0028922
185	46.65222	153.95	9.142	-33985.91	0.0029756
190	45.95337	150.21	8.875	-31315.88	0.0030623
195	45.24499	146.59	8.611	-28840.52	0.0031525
200	44.52701	143.05	8.353	-26544.43	0.0032466
205	43.79938	139.60	8.099	-24414.64	0.0033447
210	43.06206	136.21	7.852	-22439.85	0.0034469
215	42.31506	132.90	7.611	-20609.84	0.0035535
220	41.55940	129.65	7.377	-18915.23	0.0036645
225	40.79217	126.45	7.150	-17347.31	0.0037800
230	40.01651	123.33	6.929	-15898.01	0.0039000
235	39.23162	120.26	6.715	-14559.91	0.0040244
240	38.43778	117.27	6.503	-13326.32	0.0041532
245	37.63539	114.35	6.307	-12191.21	0.0042858
250	36.82499	111.51	6.113	-11149.28	0.0044218
260	35.18345	106.12	5.744	-9326.72	0.0046989
270	33.52255	101.23	5.473	-7826.37	0.0049700
280	31.95741	96.97	5.090	-6618.53	0.0052129
290	30.20921	93.47	4.809	-5670.68	0.0054906
300	28.60316	90.83	4.561	-4944.83	0.0055111
320	25.61309	88.06	4.163	-3993.94	0.0054757
340	23.01765	88.07	3.974	-3470.82	0.0051767
360	20.83935	90.06	3.663	-3180.97	0.0047550
380	19.03320	93.40	3.501	-3017.66	0.0043132
400	17.53321	97.65	3.373	-2923.93	0.0039031
420	16.27653	102.49	3.269	-2868.94	0.0035429
440	15.21129	107.72	3.191	-2835.81	0.0032338
460	14.29773	113.20	3.107	-2815.24	0.0029704
480	13.50370	118.83	3.043	-2802.02	0.0027456
500	12.80746	124.57	2.987	-2793.17	0.0025527
520	12.19079	130.36	2.937	-2786.96	0.0023860
540	11.63999	136.19	2.893	-2782.37	0.0022407
560	11.14439	142.04	2.853	-2778.77	0.0021131
580	10.69553	147.89	2.817	-2775.78	0.0020002
600	10.28662	153.75	2.784	-2773.15	0.0018999
650	9.40557	168.37	2.712	-2767.33	0.0016909
700	8.67995	182.97	2.652	-2761.81	0.0015267
750	8.06961	197.56	2.599	-2756.23	0.0013942
800	7.54751	212.19	2.551	-2750.52	0.0012947
850	7.09471	226.88	2.508	-2744.71	0.0011926
900	6.69751	241.67	2.467	-2738.85	0.0011139
950	6.34571	256.59	2.429	-2733.00	0.0010459
1000	6.03155	271.44	2.392	-2727.20	0.0009964
1100	5.49326	302.20	2.323	-2715.88	0.0008871
1200	5.04775	333.39	2.259	-2705.09	0.0008073
1300	4.67207	365.18	2.200	-2694.93	0.0007416
1400	4.35046	397.48	2.146	-2685.43	0.0006864
1500	4.07169	430.22	2.097	-2676.57	0.0006393
2000	3.09141	597.36	1.914	-2640.80	0.0004787
2500	2.49601	767.58	1.803	-2615.68	0.0003842
3000	2.09434	936.77	1.734	-2597.44	0.0003214
3500	1.80455	1104.79	1.698	-2583.75	0.0002765

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

3000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(DP/DU) PSIA-CU FT/RTU	V(DP/DV) PSIA	(DV/DT) /V DEG. R
*121.633	54.74803	253.12	12.530	-115733.81	0.0017729
125	54.41632	245.01	12.142	-106758.67	0.0018372
130	53.90578	233.05	11.750	-95427.45	0.0019333
135	53.37460	222.00	11.481	-86003.03	0.0020272
140	52.82437	212.71	11.269	-78055.54	0.0021169
145	52.25706	203.70	11.073	-71267.61	0.0022013
150	51.67473	196.32	10.889	-65375.37	0.0022804
155	51.07929	189.91	10.691	-60203.38	0.0023548
160	50.47241	184.27	10.481	-55601.79	0.0024256
165	49.85545	179.24	10.261	-51461.21	0.0024937
170	49.22947	174.69	10.031	-47699.60	0.0025603
175	48.59523	170.50	9.794	-44255.70	0.0026264
180	47.95331	166.59	9.552	-41083.87	0.0026927
185	47.30408	162.90	9.308	-38149.92	0.0027599
190	46.64783	159.37	9.064	-35427.99	0.0028284
195	45.98474	155.97	8.822	-32898.14	0.0028985
200	45.31499	152.69	8.583	-30544.53	0.0029705
205	44.63873	149.50	8.348	-28354.17	0.0030443
210	43.95613	146.39	8.118	-26315.93	0.0031200
215	43.26738	143.36	7.893	-24420.00	0.0031975
220	42.57273	140.40	7.674	-22657.40	0.0032768
225	41.87245	137.51	7.461	-21019.82	0.0033577
230	41.16688	134.69	7.255	-19499.47	0.0034402
235	40.45638	131.95	7.054	-18089.03	0.0035239
240	39.74139	129.29	6.860	-16781.65	0.0036087
245	39.02241	126.68	6.673	-15571.01	0.0036943
250	38.29998	124.16	6.491	-14451.26	0.0037804
260	36.94746	119.38	6.147	-12463.63	0.0039517
270	35.39021	114.99	5.827	-10781.48	0.0041170
280	33.93658	111.06	5.531	-9373.01	0.0042682
290	32.49710	107.65	5.260	-8209.07	0.0043955
300	31.08413	104.84	5.013	-7260.80	0.0044888
320	28.38973	101.12	4.594	-5892.02	0.0045486
340	25.94219	99.80	4.265	-5034.94	0.0044426
360	23.78603	100.44	4.009	-4500.88	0.0042206
380	21.92039	102.55	3.809	-4163.38	0.0039424
400	20.31755	105.74	3.649	-3945.61	0.0036513
420	18.94012	109.71	3.517	-3801.78	0.0033723
440	17.75089	114.24	3.408	-3704.31	0.0031168
460	16.71703	119.16	3.314	-3636.40	0.0028885
480	15.81122	124.35	3.234	-3587.64	0.0026866
500	15.01130	129.74	3.164	-3551.56	0.0025088
520	14.29951	135.27	3.102	-3524.03	0.0023522
540	13.66165	140.89	3.047	-3502.39	0.0022138
560	13.08634	146.57	2.999	-3484.90	0.0020910
580	12.56436	152.30	2.954	-3470.38	0.0019815
600	12.08923	158.06	2.913	-3458.03	0.0018834
650	11.06093	172.54	2.826	-3433.45	0.0016780
700	10.21363	187.08	2.753	-3414.28	0.0015155
750	9.50053	201.69	2.691	-3398.20	0.0013838
800	8.89030	216.35	2.635	-3384.03	0.0012749
850	8.36093	231.11	2.584	-3371.17	0.0011832
900	7.89647	245.98	2.538	-3359.28	0.0011049
950	7.48502	260.99	2.494	-3348.16	0.0010372
1000	7.11751	276.14	2.452	-3337.67	0.0009779
1100	6.48764	306.92	2.375	-3318.30	0.0008791
1200	5.96606	338.32	2.305	-3300.73	0.0007998
1300	5.52600	370.31	2.241	-3284.72	0.0007346
1400	5.14906	402.22	2.183	-3270.06	0.0006799
1500	4.82212	435.76	2.131	-3256.61	0.0006333
2000	3.67047	604.23	1.936	-3203.59	0.0004744
2500	2.96892	774.52	1.819	-3167.00	0.0003811
3000	2.49447	944.08	1.747	-3140.61	0.0003191
3500	2.15150	1112.34	1.698	-3120.83	0.0002748

THERMODYNAMIC PROPERTIES OF NITROGEN

3500 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)$ BTU/LB	$V(DP/DV)$ PSIA-CU FT/RTU	$V(DP/DV)$ PSIA	$(DV/DT) / V$ DEG. R
*122.920	54.86050	262.63	11.919	-117660.86	0.0016940
125	54.66550	257.14	11.735	-112171.91	0.0017323
130	54.18149	244.15	11.427	-100635.61	0.0018251
135	53.67705	232.22	11.230	-91019.60	0.0019159
140	53.15367	221.72	11.081	-82904.18	0.0020025
145	52.61333	212.67	10.947	-75966.59	0.0020836
150	52.05812	204.91	10.809	-69957.30	0.0021589
155	51.49010	198.24	10.657	-64683.54	0.0022287
160	50.91111	192.46	10.488	-59997.15	0.0022939
165	50.32272	187.37	10.304	-55785.02	0.0023554
170	49.72619	182.82	10.106	-51961.43	0.0024142
175	49.12251	178.69	9.897	-48461.83	0.0024713
180	48.51243	174.89	9.680	-45237.74	0.0025274
185	47.89655	171.33	9.459	-42252.76	0.0025832
190	47.27528	167.97	9.235	-39479.34	0.0026391
195	46.64899	164.76	9.011	-36896.39	0.0026955
200	46.01796	161.68	8.788	-34487.39	0.0027524
205	45.38247	158.70	8.568	-32239.01	0.0028101
210	44.74276	155.81	8.351	-30140.14	0.0028685
215	44.09913	153.00	8.139	-28181.12	0.0029275
220	43.45186	150.27	7.932	-26353.33	0.0029871
225	42.80130	147.62	7.730	-24648.82	0.0030471
230	42.14780	145.03	7.534	-23060.18	0.0031073
235	41.49177	142.53	7.343	-21580.39	0.0031677
240	40.83363	140.09	7.158	-20202.82	0.0032279
245	40.17386	137.73	6.990	-18921.21	0.0032878
250	39.51297	135.45	6.807	-17729.67	0.0033471
260	38.19002	131.12	6.478	-15595.24	0.0034620
270	36.86964	127.14	6.172	-13760.25	0.0035728
280	35.55745	123.53	5.889	-12190.99	0.0036730
290	34.25986	120.33	5.625	-10858.06	0.0037593
300	32.98405	117.58	5.383	-9734.82	0.0038273
320	30.52803	113.56	4.959	-8017.41	0.0038940
340	28.24565	111.51	4.611	-6848.12	0.0039604
360	26.17497	111.24	4.328	-6060.67	0.0037413
380	24.32877	112.43	4.100	-5527.56	0.0035664
400	22.69915	114.77	3.913	-5161.16	0.0033643
420	21.26642	117.97	3.758	-4904.51	0.0031557
440	20.00645	121.82	3.629	-4720.99	0.0029535
460	18.89511	126.18	3.517	-4586.92	0.0027642
480	17.91039	130.90	3.422	-4486.77	0.0025907
500	17.03321	135.90	3.338	-4410.24	0.0024335
520	16.24745	141.10	3.265	-4350.45	0.0022919
540	15.53965	146.46	3.200	-4302.69	0.0021645
560	14.89865	151.92	3.142	-4263.75	0.0020499
580	14.31523	157.48	3.089	-4231.36	0.0019466
600	13.78171	163.09	3.042	-4203.95	0.0018532
650	12.62676	177.33	2.939	-4150.34	0.0016555
700	11.67131	191.74	2.854	-4110.31	0.0014975
750	10.86544	206.28	2.782	-4078.40	0.0013686
800	10.17431	220.93	2.718	-4051.72	0.0012615
850	9.57507	235.71	2.650	-4028.63	0.0011711
900	9.04842	250.67	2.609	-4008.14	0.0010937
950	8.58156	265.63	2.559	-3989.64	0.0010268
1000	8.16433	280.90	2.513	-3972.71	0.0009682
1100	7.44967	311.84	2.428	-3942.49	0.0008704
1200	6.85552	343.42	2.352	-3916.03	0.0007919
1300	6.35466	375.59	2.283	-3892.49	0.0007274
1400	5.92529	408.29	2.220	-3871.33	0.0006733
1500	5.55261	441.40	2.164	-3852.16	0.0006272

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

4000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DH)	V(OP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	RTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*124.197	54.97578	271.97	11.415	-119719.09	0.0016211
125	54.90396	269.64	11.362	-117617.88	0.0016355
130	54.44456	255.48	11.130	-105868.49	0.0017256
135	53.96432	242.55	10.999	-96054.77	0.0018142
140	53.46613	231.25	10.910	-87761.83	0.0018986
145	52.95040	221.58	10.829	-80669.19	0.0019775
150	52.41979	213.37	10.737	-74527.41	0.0020501
155	51.87643	206.39	10.627	-69142.06	0.0021168
160	51.32230	200.41	10.496	-64362.14	0.0021780
165	50.75913	195.21	10.345	-60071.15	0.0022349
170	50.18935	190.63	10.176	-56179.90	0.0022881
175	49.61112	186.53	9.993	-52620.55	0.0023387
180	49.02837	182.80	9.798	-49341.75	0.0023875
185	48.44090	179.35	9.597	-46304.72	0.0024350
190	47.84899	176.11	9.391	-43480.07	0.0024819
195	47.25338	173.06	9.182	-40845.36	0.0025284
200	46.65437	170.14	8.973	-38383.14	0.0025747
205	46.05227	167.33	8.765	-36079.55	0.0026211
210	45.44741	164.62	8.550	-33923.23	0.0026674
215	44.84009	162.00	8.358	-31904.55	0.0027138
220	44.23063	159.46	8.160	-30015.06	0.0027602
225	43.61936	157.00	7.967	-28247.11	0.0028064
230	43.00664	154.61	7.779	-26593.61	0.0028522
235	42.39284	152.29	7.596	-25047.89	0.0028977
240	41.77836	150.05	7.418	-23603.62	0.0029426
245	41.16361	147.88	7.246	-22254.78	0.0029867
250	40.54905	145.78	7.079	-20995.64	0.0030300
260	39.32234	141.81	6.761	-18725.10	0.0031131
270	38.10211	138.15	6.465	-16752.45	0.0031904
280	36.89255	134.82	6.198	-15043.12	0.0032602
290	35.69312	131.84	5.931	-13567.06	0.0033204
300	34.52354	129.23	5.693	-12297.82	0.0033689
320	32.25324	125.21	5.271	-10286.51	0.0034233
340	30.11831	122.82	4.914	-8839.00	0.0034145
360	28.14686	121.99	4.616	-7808.38	0.0033462
380	26.35117	122.53	4.368	-7074.61	0.0032323
400	24.73777	124.19	4.161	-6547.49	0.0030900
420	23.29121	126.76	3.937	-6163.39	0.0029343
440	21.99855	130.04	3.840	-5878.85	0.0027759
460	20.84284	133.87	3.714	-5664.38	0.0026218
480	19.80728	138.14	3.604	-5499.84	0.0024759
500	18.87631	142.75	3.509	-5371.36	0.0023401
520	18.03609	147.62	3.425	-5269.25	0.0022150
540	17.27463	152.69	3.350	-5186.70	0.0021004
560	16.59161	157.91	3.233	-5118.84	0.0019957
580	15.94828	163.26	3.223	-5062.19	0.0019001
600	15.36717	168.71	3.168	-5014.16	0.0018129
650	14.10368	182.63	3.051	-4920.74	0.0016258
700	13.05360	196.95	2.954	-4852.10	0.0014742
750	12.16511	211.27	2.872	-4798.63	0.0013494
800	11.40195	225.36	2.800	-4755.05	0.0012451
850	10.73810	240.62	2.736	-4718.28	0.0011567
900	10.15438	255.54	2.677	-4686.42	0.0010809
950	9.63636	270.63	2.623	-4658.26	0.0010151
1000	9.17299	285.89	2.572	-4632.98	0.0009574
1100	8.37730	316.94	2.440	-4588.93	0.0008611
1200	7.71698	348.66	2.338	-4551.33	0.0007836
1300	7.15881	381.00	2.324	-4518.50	0.0007199
1400	6.67985	413.85	2.257	-4489.40	0.0006665
1500	6.26376	447.13	2.198	-4463.33	0.0006210

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

4500 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(OP/DU)	V(OP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*125.464	55.09297	281.08	10.996	-121894.26	0.0015538
130	54.69609	267.07	10.856	-111131.87	0.0016337
135	54.23928	253.01	10.787	-101113.56	0.0017206
140	53.76341	240.81	10.752	-92634.62	0.0018035
145	53.27034	230.45	10.720	-85377.54	0.0018808
150	52.76273	221.73	10.672	-79073.62	0.0019517
155	52.24128	214.39	10.601	-73587.38	0.0020162
160	51.70957	208.16	10.505	-68705.52	0.0020743
165	51.16896	202.82	10.384	-64328.50	0.0021283
170	50.62101	198.17	10.242	-60363.84	0.0021776
175	50.06704	194.07	10.082	-56740.48	0.0022235
180	49.50310	190.37	9.903	-53404.20	0.0022668
185	48.94502	187.00	9.725	-50313.76	0.0023083
190	48.37848	183.97	9.534	-47437.79	0.0023485
195	47.80901	180.94	9.339	-44752.28	0.0023877
200	47.23705	178.16	9.143	-42238.70	0.0024263
205	46.66300	175.50	8.946	-39882.46	0.0024644
210	46.08719	172.95	8.750	-37671.78	0.0025021
215	45.50995	170.49	8.557	-35596.87	0.0025395
220	44.93159	168.11	8.367	-33649.29	0.0025764
225	44.35243	165.81	8.181	-31821.57	0.0026129
230	43.77281	163.58	7.999	-30106.88	0.0026489
235	43.19306	161.43	7.821	-28498.83	0.0026842
240	42.61354	159.34	7.649	-26991.41	0.0027188
245	42.03463	157.32	7.482	-25578.86	0.0027524
250	41.45669	155.38	7.319	-24255.71	0.0027852
260	40.30533	151.70	7.010	-21856.91	0.0028472
270	39.16266	148.31	6.720	-19756.20	0.0029038
280	38.03200	145.23	6.449	-17919.03	0.0029542
290	36.91670	142.45	6.197	-16314.98	0.0029973
300	35.82014	140.00	5.962	-14917.43	0.0030320
320	33.69660	136.11	5.541	-12650.20	0.0030726
340	31.68651	133.60	5.180	-10955.84	0.0030708
360	29.81002	132.45	4.872	-9699.70	0.0030273
380	28.07929	132.54	4.612	-8770.21	0.0029489
400	26.49765	133.71	4.390	-8079.06	0.0028455
420	25.06098	135.78	4.202	-7559.97	0.0027272
440	23.76016	138.58	4.040	-7165.05	0.0026024
460	22.58347	141.97	3.901	-6860.29	0.0024771
480	21.51831	145.83	3.780	-6621.66	0.0023551
500	20.55234	150.07	3.673	-6432.07	0.0022389
520	19.67405	154.62	3.579	-6279.25	0.0021297
540	18.87309	159.40	3.496	-6154.32	0.0020279
560	18.14027	164.39	3.421	-6050.79	0.0019336
580	17.46757	169.52	3.353	-5963.86	0.0018464
600	16.84291	174.78	3.292	-5889.95	0.0017660
650	15.49401	188.35	3.161	-5746.07	0.0015910
700	14.36245	202.32	3.053	-5640.97	0.0014470
750	13.40126	216.59	2.961	-5560.02	0.0013273
800	12.57328	231.09	2.881	-5494.97	0.0012265
850	11.85146	245.79	2.810	-5440.91	0.0011406
900	11.21568	260.69	2.746	-5394.77	0.0010667
950	10.65068	275.78	2.687	-5354.57	0.0010023
1000	10.14468	291.07	2.632	-5318.95	0.0009458
1100	9.27457	322.20	2.532	-5257.93	0.0008512
1200	8.55137	354.04	2.444	-5206.83	0.0007751
1300	7.93926	386.51	2.365	-5162.88	0.0007123
1400	7.41345	419.50	2.294	-5124.38	0.0006596
1500	6.95620	452.93	2.231	-5090.19	0.0006148

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

5000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*126.720	55.21163	289.92	10.649	-124173.76	0.0014918
130	54.93783	278.93	10.601	-116428.61	0.0015485
135	54.50160	263.63	10.588	-106200.07	0.0016341
140	54.04694	250.43	10.605	-97527.69	0.0017159
145	53.57486	239.30	10.619	-90097.65	0.0017923
150	53.08740	230.01	10.612	-83662.65	0.0018621
155	52.58708	222.26	10.578	-78026.74	0.0019252
160	52.07579	215.75	10.514	-73034.80	0.0019820
165	51.55557	210.23	10.422	-68564.64	0.0020331
170	51.02812	205.48	10.304	-64520.71	0.0020795
175	50.49487	201.34	10.166	-60828.87	0.0021220
180	49.95697	197.66	10.011	-57432.01	0.0021614
185	49.41539	194.34	9.844	-54286.38	0.0021984
190	48.87097	191.29	9.667	-51358.50	0.0022335
195	48.32403	188.46	9.485	-48622.70	0.0022673
200	47.77537	185.80	9.299	-46059.13	0.0023000
205	47.22531	183.28	9.111	-43652.45	0.0023319
210	46.67422	180.86	8.924	-41390.15	0.0023632
215	46.12243	178.55	8.738	-39262.15	0.0023938
220	45.57025	176.31	8.555	-37259.92	0.0024238
225	45.01799	174.15	8.375	-35376.01	0.0024532
230	44.46576	172.07	8.198	-33603.74	0.0024820
235	43.91446	170.05	8.026	-31936.96	0.0025100
240	43.36391	168.10	7.858	-30369.90	0.0025372
245	42.81433	166.22	7.694	-28897.10	0.0025636
250	42.26635	164.41	7.535	-27513.32	0.0025889
260	41.17421	160.93	7.232	-24993.00	0.0026364
270	40.09608	157.93	6.947	-22771.41	0.0026792
280	39.02964	154.95	6.680	-20814.62	0.0027165
290	37.97653	152.36	6.431	-19092.32	0.0027479
300	36.94236	150.06	6.199	-17577.77	0.0027729
320	34.93759	146.35	5.779	-15080.40	0.0029018
340	33.03243	143.84	5.416	-13164.02	0.0029005
360	31.24143	142.53	5.103	-11700.59	0.0027692
380	29.57407	142.34	4.833	-10594.96	0.0027115
400	28.03409	143.16	4.601	-9732.12	0.0026333
420	26.61997	144.84	4.401	-9075.61	0.0025412
440	25.32579	147.26	4.229	-8565.22	0.0024414
460	24.14366	150.27	4.078	-8163.81	0.0023386
480	23.06405	153.78	3.947	-7844.23	0.0022364
500	22.07724	157.70	3.831	-7586.65	0.0021370
520	21.17380	161.94	3.728	-7376.47	0.0020420
540	20.34492	166.46	3.637	-7202.93	0.0019521
560	19.58261	171.20	3.555	-7057.95	0.0018677
580	18.97267	176.13	3.480	-6935.48	0.0017888
600	18.42274	181.20	3.413	-6830.92	0.0017152
650	16.80159	194.39	3.268	-6626.60	0.0015529
700	15.60080	208.11	3.149	-6477.42	0.0014172
750	14.57628	222.19	3.049	-6363.11	0.0013031
800	13.69084	236.57	2.961	-6271.98	0.0012062
850	12.91695	251.19	2.884	-6196.97	0.0011233
900	12.23293	266.05	2.814	-6133.59	0.0010515
950	11.62595	281.13	2.749	-6078.50	0.0009988
1000	11.08071	296.42	2.690	-6030.89	0.0009337
1100	10.14160	327.60	2.593	-5949.68	0.0008410
1200	9.35964	359.53	2.499	-5882.67	0.0007663
1300	8.69684	392.11	2.405	-5825.72	0.0007046
1400	8.12679	425.23	2.331	-5776.30	0.0006527
1500	7.63056	458.79	2.264	-5732.75	0.0006085

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN					
6000 PSIA ISOBAR					
TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT)/V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*129.204	55.45162	306.69	10.124	-129002.08	0.0013817
130	55.39034	303.57	10.134	-127132.60	0.0013952
135	54.99374	285.40	10.226	-116469.10	0.0014789
140	54.57746	269.92	10.337	-107391.10	0.0015595
145	54.14323	257.03	10.435	-99592.88	0.0016348
150	53.69307	246.41	10.504	-92831.47	0.0017036
155	53.22926	237.70	10.537	-86911.70	0.0017655
160	52.75407	230.51	10.532	-81676.28	0.0018204
165	52.26959	224.53	10.492	-76998.83	0.0018690
170	51.77773	219.51	10.419	-72778.46	0.0019120
175	51.28010	215.22	10.320	-68935.29	0.0019502
180	50.77807	211.51	10.198	-65406.64	0.0019345
185	50.27275	208.24	10.059	-62143.62	0.0020155
190	49.76507	205.30	9.908	-59108.34	0.0020440
195	49.25576	202.63	9.747	-56271.48	0.0020705
200	48.74543	200.16	9.579	-53610.31	0.0020953
205	48.23456	197.85	9.408	-51107.14	0.0021188
210	47.72358	195.66	9.235	-48748.00	0.0021412
215	47.21292	193.59	9.061	-46521.70	0.0021627
220	46.70262	191.60	8.888	-44419.08	0.0021833
225	46.19324	189.69	8.718	-42432.41	0.0022032
230	45.68496	187.85	8.549	-40555.01	0.0022224
235	45.17804	186.08	8.394	-38780.91	0.0022407
240	44.67272	184.37	8.223	-37104.69	0.0022584
245	44.16925	182.72	8.065	-35521.26	0.0022752
250	43.66798	181.13	7.912	-34025.83	0.0022911
260	42.67241	178.13	7.617	-31280.86	0.0023204
270	41.68922	175.37	7.339	-28835.27	0.0023458
280	40.71718	172.85	7.078	-26657.27	0.0023672
290	39.76108	170.58	6.833	-24717.76	0.0023844
300	38.82159	168.56	6.603	-22990.48	0.0023973
320	36.99844	165.25	6.186	-20081.32	0.0024099
340	35.25828	162.92	5.820	-17772.23	0.0024047
360	33.60920	161.55	5.500	-15939.16	0.0023926
380	32.05655	161.10	5.220	-14483.09	0.0023448
400	30.60235	161.51	4.974	-13324.07	0.0022940
420	29.24790	162.69	4.759	-12397.73	0.0022331
440	27.98911	164.56	4.570	-11652.62	0.0021652
460	26.82211	167.01	4.403	-11049.23	0.0020932
480	25.74138	169.97	4.255	-10555.92	0.0020194
500	24.74075	173.36	4.124	-10149.05	0.0019456
520	23.81387	177.11	4.007	-9810.37	0.0018731
540	22.95445	181.15	3.902	-9525.87	0.0018029
560	22.15654	185.49	3.807	-9284.74	0.0017355
580	21.41454	190.01	3.722	-9078.61	0.0016713
600	20.72333	194.73	3.643	-8900.92	0.0016103
650	19.18791	207.19	3.475	-8549.93	0.0014722
700	17.88059	220.35	3.336	-8291.74	0.0013533
750	16.75453	234.03	3.219	-8094.06	0.0012511
800	15.77420	248.11	3.117	-7937.43	0.0011628
850	14.91243	262.54	3.027	-7809.68	0.0010862
900	14.14834	277.26	2.946	-7702.94	0.0010192
950	13.46562	292.27	2.873	-7611.91	0.0009603
1000	12.85142	307.52	2.805	-7532.94	0.0009081
1100	11.78951	338.74	2.694	-7401.59	0.0008199
1200	10.90148	370.79	2.579	-7295.40	0.0007483
1300	10.14668	403.55	2.486	-7206.73	0.0006389
1400	9.49559	436.88	2.403	-7130.89	0.0006388
1500	8.92750	470.67	2.330	-7064.84	0.0005961

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

7000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV) P	V(DP/DV) V	V(DP/DV) T	(DV/DT) /V P
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*131.650	55.69284	322.13	9.770	-134128.16	0.0012880
135	55.44789	308.03	9.898	-126881.89	0.0013432
140	55.06565	289.85	10.093	-117378.51	0.0014232
145	54.66481	274.90	10.267	-109197.21	0.0014933
150	54.24734	262.73	10.405	-102071.16	0.0015670
155	53.81550	252.67	10.499	-95837.86	0.0016287
160	53.37159	244.87	10.548	-90329.70	0.0016933
165	52.91781	238.32	10.554	-85417.66	0.0017311
170	52.45619	232.92	10.521	-80996.67	0.0017727
175	51.98849	228.41	10.457	-76981.86	0.0018088
180	51.51626	224.58	10.365	-73305.32	0.0018404
185	51.04075	221.29	10.251	-69913.15	0.0018582
190	50.56302	218.40	10.121	-66762.87	0.0018928
195	50.08333	215.83	9.978	-63821.22	0.0019149
200	49.60416	213.50	9.826	-61062.19	0.0019349
205	49.12429	211.36	9.668	-58465.39	0.0019533
210	48.64478	209.37	9.506	-56014.83	0.0019702
215	48.16600	207.49	9.342	-53697.77	0.0019860
220	47.68828	205.72	9.179	-51503.97	0.0020009
225	47.21191	204.02	9.014	-49425.00	0.0020148
230	46.73712	202.40	8.852	-47453.78	0.0020280
235	46.26414	200.84	8.693	-45584.21	0.0020404
240	45.79319	199.33	8.536	-43810.86	0.0020522
245	45.32446	197.89	8.383	-42128.84	0.0020632
250	44.85814	196.49	8.233	-40533.62	0.0020734
260	43.93346	193.86	7.944	-37586.67	0.0020918
270	43.02058	191.44	7.671	-34938.17	0.0021072
280	42.12033	189.22	7.413	-32558.71	0.0021195
290	41.23546	187.23	7.170	-30421.07	0.0021297
300	40.36563	185.45	6.942	-28500.17	0.0021347
320	38.67661	182.52	6.525	-25219.63	0.0021376
340	37.06057	180.44	6.158	-22561.07	0.0021286
360	35.52235	179.13	5.834	-20400.46	0.0021088
380	34.06495	178.70	5.547	-18639.63	0.0020790
400	32.68960	178.95	5.293	-17200.27	0.0020409
420	31.39598	179.88	5.068	-16019.36	0.0019958
440	30.18237	181.43	4.868	-15046.03	0.0019456
460	29.04526	183.52	4.690	-14239.35	0.0018918
480	27.98308	186.11	4.531	-13566.55	0.0018359
500	26.98955	189.11	4.389	-13001.57	0.0017791
520	26.06987	192.49	4.261	-12523.72	0.0017224
540	25.19250	196.18	4.145	-12116.64	0.0016666
560	24.37924	200.14	4.041	-11767.38	0.0016122
580	23.61887	204.35	3.945	-11465.61	0.0015596
600	22.90521	208.77	3.858	-11203.11	0.0015089
650	21.30413	220.56	3.670	-10678.38	0.0013919
700	19.92449	233.18	3.514	-10287.84	0.0012884
750	18.72483	246.44	3.381	-9987.19	0.0011975
800	17.67250	260.21	3.267	-9748.76	0.0011178
850	16.74181	274.40	3.166	-9554.75	0.0010477
900	15.91247	288.96	3.075	-9393.33	0.0009858
950	15.16838	303.85	2.993	-9256.44	0.0009309
1000	14.49664	319.04	2.917	-9138.46	0.0008819
1100	13.33037	350.22	2.783	-8944.08	0.0007985
1200	12.35085	382.34	2.666	-8788.96	0.0007301
1300	11.51489	415.22	2.564	-8660.94	0.0006732
1400	10.79136	448.72	2.474	-8552.57	0.0006250
1500	10.15945	482.71	2.395	-8459.01	0.0005837

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

8000 PSIA ISOTHERM						
TEMPERATURE	DENSITY	V(OH/DV)	V(OP/DU)	V(OP/DV)	(DV/DT) / V	
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R	
*134.060	55.93113	336.18	9.541	-139491.39	0.0012078	
135	55.86928	331.69	9.593	-137451.04	0.0012231	
140	55.51752	310.38	9.865	-127507.94	0.0013028	
145	55.14658	293.04	10.110	-118903.99	0.0013780	
150	54.75932	279.10	10.311	-111409.48	0.0014471	
155	54.35493	267.92	10.461	-104836.55	0.0015093	
160	53.93972	258.96	10.559	-99028.82	0.0015642	
165	53.51193	251.74	10.608	-93856.13	0.0016122	
170	53.07669	245.87	10.612	-89210.45	0.0016535	
175	52.63489	241.05	10.579	-85002.80	0.0016890	
180	52.18818	237.05	10.513	-81160.58	0.0017195	
185	51.73796	233.65	10.422	-77625.12	0.0017456	
190	51.28541	230.79	10.311	-74349.41	0.0017681	
195	50.83149	228.27	10.184	-71296.09	0.0017876	
200	50.37698	226.04	10.045	-68435.57	0.0018047	
205	49.92253	224.03	9.898	-65744.51	0.0018198	
210	49.46854	222.19	9.746	-63204.47	0.0018333	
215	49.01574	220.49	9.590	-60800.81	0.0018455	
220	48.56418	218.90	9.432	-58521.82	0.0018565	
225	48.11424	217.39	9.275	-56358.03	0.0018666	
230	47.66616	215.96	9.119	-54301.61	0.0018758	
235	47.22016	214.59	8.963	-52345.98	0.0018843	
240	46.77643	213.27	8.810	-50485.49	0.0018922	
245	46.33513	212.01	8.659	-48715.17	0.0018994	
250	45.89641	210.79	8.512	-47030.51	0.0019059	
260	45.02731	208.50	8.228	-43901.97	0.0019172	
270	44.17020	206.39	7.958	-41069.75	0.0019261	
280	43.32605	204.45	7.702	-39506.49	0.0019327	
290	42.49577	202.71	7.461	-36186.83	0.0019368	
300	41.68016	201.15	7.233	-34087.24	0.0019336	
320	40.09572	198.59	6.817	-30463.16	0.0019354	
340	38.57730	196.77	6.448	-27482.34	0.0019238	
360	37.12793	195.68	6.120	-25021.19	0.0019045	
380	35.74922	195.26	5.829	-22980.95	0.0018786	
400	34.44158	195.49	5.570	-21282.89	0.0018470	
420	33.20437	196.31	5.338	-19863.90	0.0018107	
440	32.03608	197.69	5.131	-18673.05	0.0017707	
460	30.93450	199.57	4.945	-17668.98	0.0017280	
480	29.89699	201.91	4.778	-16818.11	0.0016835	
500	28.92011	204.65	4.628	-16093.12	0.0016381	
520	28.00079	207.75	4.491	-15471.88	0.0015923	
540	27.13547	211.17	4.368	-14936.42	0.0015469	
560	26.32055	214.86	4.255	-14472.19	0.0015021	
580	25.55294	218.81	4.152	-14067.37	0.0014583	
600	24.82904	222.97	4.058	-13712.35	0.0014158	
650	23.19099	234.19	3.852	-12994.62	0.0013158	
700	21.76422	246.34	3.632	-12453.76	0.0012257	
750	20.51257	259.21	3.536	-12034.13	0.0011451	
800	19.40660	272.66	3.410	-11699.97	0.0010733	
850	18.42257	286.61	3.299	-11427.70	0.0010094	
900	17.54129	300.99	3.199	-11201.33	0.0009524	
950	16.74725	315.74	3.108	-11009.77	0.0009014	
1000	16.02794	330.84	3.026	-10845.16	0.0008557	
1100	14.77333	361.95	2.879	-10575.45	0.0007770	
1200	13.71467	394.09	2.752	-10361.95	0.0007121	
1300	12.80777	427.05	2.641	-10187.14	0.0006577	
1400	12.02100	460.70	2.544	-10040.23	0.0006115	
1500	11.33105	494.95	2.459	-9914.23	0.0005717	

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

9000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*136.437	56.17101	348.87	9.405	-145043.09	0.0011389
140	55.63799	331.64	9.649	-137791.13	0.0011452
145	55.59400	311.59	9.959	-128759.20	0.0012706
150	55.23215	295.62	10.219	-120866.99	0.0013403
155	54.85446	282.96	10.421	-113931.85	0.0014032
160	54.46318	272.91	10.565	-107800.34	0.0014590
165	54.06058	264.90	10.654	-102342.56	0.0015076
170	53.64895	258.43	10.692	-97448.76	0.0015494
175	53.22995	253.29	10.687	-93026.80	0.0015851
180	52.80564	249.06	10.646	-89000.06	0.0016153
185	52.37743	245.55	10.576	-85305.50	0.0016403
190	51.94662	242.61	10.481	-81891.75	0.0016623
195	51.51425	240.10	10.368	-78717.31	0.0016805
200	51.08120	237.93	10.241	-75748.91	0.0016959
205	50.64819	236.02	10.104	-72960.00	0.0017090
210	50.21579	234.31	9.960	-70329.42	0.0017203
215	49.78447	232.75	9.811	-67840.33	0.0017301
220	49.35459	231.32	9.660	-65479.25	0.0017386
225	48.92648	229.99	9.507	-63235.31	0.0017461
230	48.50037	228.72	9.354	-61099.67	0.0017527
235	48.07649	227.52	9.202	-59065.02	0.0017585
240	47.65500	226.33	9.052	-57125.19	0.0017637
245	47.23606	225.29	8.904	-55274.89	0.0017682
250	46.81991	224.24	8.759	-53509.48	0.0017722
260	45.99583	222.27	8.478	-50217.05	0.0017786
270	45.18389	220.45	8.210	-47218.41	0.0017831
280	44.38473	218.79	7.956	-44487.57	0.0017857
290	43.59838	217.27	7.716	-42000.77	0.0017864
300	42.82720	215.92	7.499	-39735.94	0.0017854
320	41.32747	213.71	7.072	-35791.65	0.0017782
340	39.89856	212.16	6.702	-32508.89	0.0017646
360	38.51233	211.25	6.371	-29766.08	0.0017456
380	37.19956	210.94	6.077	-27464.23	0.0017218
400	35.95013	211.22	5.813	-25523.72	0.0016940
420	34.76114	212.02	5.577	-23880.53	0.0016630
440	33.63712	213.33	5.365	-22483.04	0.0016294
460	32.57013	215.09	5.173	-21289.25	0.0015938
480	31.55938	217.27	5.000	-20264.88	0.0015569
500	30.60393	219.84	4.843	-19381.77	0.0015192
520	29.69927	222.74	4.701	-18616.81	0.0014811
540	28.84343	225.96	4.571	-17950.94	0.0014430
560	28.03348	229.45	4.452	-17368.47	0.0014053
580	27.26666	233.19	4.343	-16856.45	0.0013683
600	26.54028	237.15	4.243	-16404.18	0.0013320
650	24.88454	247.90	4.023	-15480.34	0.0012458
700	23.42873	259.43	3.840	-14775.80	0.0011668
750	22.14136	272.14	3.693	-14224.56	0.0010951
800	20.99613	285.30	3.547	-13783.19	0.0010304
850	19.97131	299.02	3.436	-13422.42	0.0009722
900	19.04974	313.21	3.318	-13122.07	0.0009199
950	18.21462	327.83	3.220	-12867.92	0.0008726
1000	17.45571	342.93	3.131	-12649.73	0.0008299
1100	16.12706	373.94	2.972	-12293.22	0.0007560
1200	15.00026	405.97	2.836	-12012.38	0.0006944
1300	14.03130	439.01	2.717	-11793.65	0.0006425
1400	13.18907	472.76	2.613	-11592.42	0.0005982
1500	12.44667	507.06	2.521	-11429.19	0.0005599

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

10000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV) P	V(DP/DV) V	V(CP/DV) T	(DV/DT) /V P
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*138.781	56.40543	360.30	9.339	-150743.98	0.0010793
140	56.33061	353.80	9.437	-148235.10	0.0010734
145	56.01141	330.66	9.809	-138764.19	0.0011739
150	55.67369	312.42	10.125	-130458.55	0.0012442
155	55.31945	298.08	10.377	-123142.10	0.0013079
160	54.95090	286.81	10.564	-116665.35	0.0013647
165	54.57031	277.91	10.691	-110899.99	0.0014142
170	54.17936	270.86	10.761	-105735.72	0.0014570
175	53.78158	265.23	10.784	-101078.24	0.0014933
180	53.37733	260.70	10.765	-96847.68	0.0015239
185	52.96869	257.01	10.714	-92977.13	0.0015494
190	52.55705	253.98	10.635	-89411.14	0.0015706
195	52.14356	251.45	10.535	-86104.19	0.0015882
200	51.72917	249.30	10.419	-83019.29	0.0016028
205	51.31469	247.46	10.291	-80126.53	0.0016148
210	50.90073	245.84	10.154	-77401.85	0.0016248
215	50.48782	244.41	10.011	-74825.94	0.0016330
220	50.07637	243.11	9.864	-72383.29	0.0016399
225	49.66672	241.92	9.715	-70061.42	0.0016456
230	49.25912	240.82	9.566	-67850.18	0.0016504
235	48.85381	239.78	9.417	-65741.27	0.0016544
240	48.45096	238.80	9.269	-63727.80	0.0016576
245	48.05072	237.87	9.123	-61803.96	0.0016603
250	47.65321	236.93	8.990	-59964.75	0.0016625
260	46.86678	235.31	8.701	-56523.26	0.0016654
270	46.09239	232.77	8.435	-53373.39	0.0016666
280	45.33058	232.36	8.182	-50489.71	0.0016664
290	44.58190	231.03	7.942	-47849.55	0.0016646
300	43.94644	229.94	7.715	-45432.08	0.0016616
320	42.41720	228.08	7.299	-41189.18	0.0016515
340	41.04478	226.79	6.927	-37622.08	0.0016363
360	39.73017	226.07	6.595	-34612.61	0.0016179
380	38.47360	225.90	6.297	-32062.61	0.0015955
400	37.27456	226.24	6.031	-29891.99	0.0015702
420	36.13202	227.08	5.791	-28035.45	0.0015426
440	35.04449	228.77	5.575	-26440.63	0.0015132
460	34.01017	230.08	5.379	-25064.55	0.0014825
480	33.02704	232.17	5.201	-23872.11	0.0014507
500	32.09289	234.62	5.040	-22834.38	0.0014184
520	31.20544	237.40	4.892	-21927.45	0.0013858
540	30.36234	240.47	4.757	-21131.43	0.0013532
560	29.56124	243.81	4.634	-20429.77	0.0013209
580	28.79981	247.39	4.520	-19808.65	0.0012889
600	28.07579	251.19	4.414	-19256.51	0.0012574
650	26.41517	261.55	4.183	-18118.10	0.0011922
700	24.94317	272.93	3.989	-17240.22	0.0011123
750	23.63220	285.13	3.822	-16547.63	0.0010482
800	22.45877	298.03	3.677	-15989.77	0.0009898
850	21.40314	311.53	3.548	-15531.96	0.0009368
900	20.44878	325.55	3.433	-15149.88	0.0008886
950	19.58139	340.02	3.328	-14826.17	0.0008448
1000	18.79093	354.93	3.232	-14548.20	0.0008050
1100	17.39963	385.83	3.063	-14094.41	0.0007356
1200	16.21425	417.94	2.917	-13737.87	0.0006773
1300	15.19104	451.02	2.791	-13448.47	0.0006273
1400	14.29780	484.87	2.680	-13207.41	0.0005853
1500	13.51041	519.29	2.582	-13002.38	0.0005485

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

12000 PSIA 150MM

TEMPERATURE	DENSITY	V(CU/DV)	V(OP/DU)	V(OP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*143.377	56.86139	379.95	9.354	-162472.10	0.0009818
145	56.76976	370.87	9.506	-159247.42	0.0010059
150	56.47479	347.22	9.926	-150081.86	0.0010770
155	56.16220	328.95	10.271	-141958.33	0.0011422
160	55.83493	314.91	10.540	-134737.99	0.0012008
165	55.49245	303.83	10.737	-128298.78	0.0012526
170	55.13942	295.26	10.857	-122532.52	0.0012976
175	54.77763	288.55	10.940	-117343.55	0.0013360
180	54.40941	283.27	10.964	-112647.97	0.0013683
185	54.03368	279.07	10.947	-108372.96	0.0013952
190	53.65498	275.73	10.898	-104456.15	0.0014173
195	53.27362	273.04	10.821	-100844.72	0.0014353
200	52.89070	270.85	10.724	-97494.44	0.0014497
205	52.50716	269.05	10.612	-94368.64	0.0014611
210	52.12375	267.56	10.487	-91437.12	0.0014701
215	51.74109	266.29	10.355	-88675.19	0.0014770
220	51.35958	265.21	10.216	-86062.49	0.0014822
225	50.97934	264.26	10.074	-83583.24	0.0014861
230	50.60218	263.42	9.930	-81223.48	0.0014888
235	50.22655	262.66	9.786	-78972.52	0.0014906
240	49.85355	261.97	9.642	-76821.41	0.0014916
245	49.48306	261.33	9.499	-74762.72	0.0014920
250	49.11529	260.73	9.358	-72790.27	0.0014919
260	48.38829	259.63	9.093	-69083.83	0.0014903
270	47.67314	258.63	8.819	-65667.99	0.0014874
280	46.97019	257.72	8.568	-62516.04	0.0014834
290	46.27968	256.90	8.329	-59605.68	0.0014785
300	45.60177	256.16	8.102	-56917.42	0.0014727
320	44.28410	254.93	7.685	-52137.85	0.0014589
340	43.01750	254.23	7.311	-48051.09	0.0014425
360	41.80183	253.91	6.977	-44547.85	0.0014239
380	40.63649	254.03	6.676	-41534.37	0.0014032
400	39.52054	254.59	6.405	-38931.50	0.0013811
420	38.45272	255.55	6.160	-36673.37	0.0013578
440	37.43155	256.89	5.938	-34705.63	0.0013336
460	36.45538	258.60	5.736	-32983.49	0.0013089
480	35.52246	260.64	5.552	-31470.02	0.0012835
500	34.63098	262.98	5.384	-30134.65	0.0012581
520	33.77910	265.62	5.230	-28951.92	0.0012326
540	32.96499	268.52	5.088	-27900.52	0.0012071
560	32.18682	271.67	4.957	-26962.51	0.0011818
580	31.44282	275.05	4.835	-26122.76	0.0011569
600	30.73126	278.63	4.723	-25368.40	0.0011323
650	29.08338	288.44	4.474	-23788.21	0.0010728
700	27.60348	299.27	4.263	-22545.58	0.0010169
750	26.26336	310.98	4.090	-21550.06	0.0009646
800	25.06356	323.44	3.919	-20738.69	0.0009163
850	23.96923	336.57	3.777	-20066.94	0.0008717
900	22.96993	350.28	3.648	-19502.76	0.0008307
950	22.05635	364.52	3.532	-19022.73	0.0007930
1000	21.21754	379.24	3.425	-18609.45	0.0007583
1100	19.73008	409.90	3.236	-17933.81	0.0006970
1200	18.45120	441.95	3.074	-17403.46	0.0006447
1300	17.33912	475.10	2.933	-16974.31	0.0005997
1400	16.36241	509.11	2.810	-16618.29	0.0005608
1500	15.49701	543.75	2.702	-16316.83	0.0005268

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

14000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)_P$	$V(DP/DV)_V$	$V(DP/DV)_T$	$(DV/DT)_P / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*147.859	57.29924	396.32	9.472	-174486.44	0.0009056
150	57.19544	384.33	9.704	-170373.60	0.0009355
155	56.90903	361.23	10.136	-161353.03	0.0010317
160	56.61406	343.60	10.492	-153336.20	0.0010619
165	56.30853	330.07	10.744	-146160.23	0.0011157
170	55.98854	319.66	10.931	-139722.71	0.0011629
175	55.65812	311.59	11.052	-133929.99	0.0012037
180	55.31922	305.33	11.115	-128677.29	0.0012393
185	54.97365	300.45	11.131	-123948.92	0.0012674
190	54.62301	296.63	11.103	-119617.36	0.0012913
195	54.26875	293.64	11.054	-115644.05	0.0013107
200	53.91208	291.28	10.974	-111978.41	0.0013262
205	53.55407	289.42	10.876	-108577.36	0.0013384
210	53.19558	287.94	10.763	-105404.61	0.0013477
215	52.83735	286.76	10.640	-102429.77	0.0013547
220	52.47997	285.81	10.509	-99627.61	0.0013597
225	52.12393	285.03	10.372	-96977.28	0.0013630
230	51.76962	284.40	10.233	-94461.57	0.0013651
235	51.41733	283.86	10.092	-92066.32	0.0013660
240	51.06732	283.41	9.951	-89779.87	0.0013660
245	50.71979	283.02	9.810	-87592.57	0.0013654
250	50.37436	282.67	9.671	-85496.42	0.0013641
260	49.69329	282.09	9.399	-81551.85	0.0013601
270	49.02321	281.53	9.136	-77904.04	0.0013549
280	48.36496	281.15	8.886	-74521.79	0.0013487
290	47.71868	280.77	8.647	-71380.74	0.0013419
300	47.08440	280.44	8.421	-68460.87	0.0013344
320	45.85174	279.96	8.004	-63217.42	0.0013183
340	44.66635	279.75	7.629	-58672.69	0.0013008
360	43.52731	279.86	7.293	-54725.73	0.0012822
380	42.43347	280.31	6.990	-51288.90	0.0012627
400	41.38356	281.10	6.717	-48286.45	0.0012425
420	40.37617	282.24	6.469	-45653.68	0.0012218
440	39.40979	283.70	6.244	-43335.94	0.0012007
460	38.49286	285.47	6.039	-41287.34	0.0011794
480	37.59379	287.53	5.850	-39469.49	0.0011580
500	36.74098	289.97	5.677	-37850.29	0.0011366
520	35.92293	292.46	5.519	-36402.81	0.0011154
540	35.13778	295.30	5.372	-35104.39	0.0010943
560	34.38431	298.36	5.236	-33935.86	0.0010734
580	33.66094	301.62	5.110	-32890.92	0.0010529
600	32.96624	305.09	4.992	-31925.67	0.0010326
650	31.34608	314.55	4.731	-29899.44	0.0009836
700	29.87675	325.02	4.507	-28280.19	0.0009372
750	28.54048	336.37	4.312	-26965.54	0.0008936
800	27.32158	348.51	4.140	-25882.44	0.0008528
850	26.20631	361.35	3.985	-24977.96	0.0008148
900	25.18267	374.93	3.847	-24213.18	0.0007794
950	24.24024	388.87	3.721	-23559.09	0.0007467
1000	23.36296	403.43	3.605	-22993.80	0.0007162
1100	21.81547	433.90	3.399	-22066.36	0.0006612
1200	20.46780	465.89	3.222	-21336.74	0.0006147
1300	19.28786	499.09	3.069	-20746.33	0.0005738
1400	18.24557	533.22	2.934	-20257.19	0.0005380
1500	17.31759	568.06	2.817	-19843.85	0.0005066

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

16000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DP/DV) BTU/LB P	V(DP/DV) PSIA-CU FT/BTU V	V(DP/DV) PSIA T	(DV/DT) /V P DEG. R
*152.236	57.71551	410.58	9.674	-186661.67	0.0009440
155	57.57812	395.57	9.967	-191352.25	0.0008907
160	57.31418	373.71	10.387	-172505.41	0.0009414
165	57.03920	357.14	10.713	-164547.99	0.0009967
170	56.74453	344.50	10.954	-157385.39	0.0010459
175	56.44614	334.80	11.120	-150929.06	0.0010899
180	56.13452	327.34	11.222	-145076.29	0.0011259
185	55.81499	321.58	11.269	-139810.61	0.0011573
190	55.48912	317.14	11.272	-135002.24	0.0011834
195	55.15859	313.70	11.239	-130608.49	0.0012049
200	54.82494	311.05	11.177	-126573.77	0.0012221
205	54.48902	309.02	11.093	-122849.50	0.0012358
210	54.15149	307.46	10.991	-119393.71	0.0012462
215	53.81440	306.27	10.876	-116170.52	0.0012541
220	53.47723	305.37	10.752	-113149.51	0.0012597
225	53.14094	304.69	10.621	-110305.07	0.0012634
230	52.80610	304.19	10.485	-107615.77	0.0012655
235	52.47379	303.82	10.349	-105063.73	0.0012664
240	52.14159	303.55	10.210	-102634.07	0.0012662
245	51.81264	303.36	10.072	-100314.40	0.0012652
250	51.48612	303.23	9.934	-98094.43	0.0012635
260	50.84091	303.09	9.664	-93920.53	0.0012584
270	50.20670	303.05	9.403	-90058.74	0.0012519
280	49.58397	303.06	9.153	-86470.47	0.0012445
290	48.97257	303.11	8.915	-83126.88	0.0012365
300	48.37291	303.17	8.689	-80005.53	0.0012280
320	47.20750	303.39	8.272	-74358.99	0.0012104
340	46.08681	303.76	7.897	-69412.14	0.0011922
360	45.00927	304.32	7.561	-65069.23	0.0011736
380	43.97334	305.12	7.257	-61248.25	0.0011548
400	42.97748	306.18	6.982	-57877.79	0.0011359
420	42.02013	307.52	6.733	-54895.73	0.0011169
440	41.09976	309.13	6.505	-52249.54	0.0010978
460	40.21433	311.00	6.298	-49890.28	0.0010798
480	39.36393	313.13	6.107	-47782.23	0.0010600
500	38.54530	315.50	5.932	-45891.00	0.0010413
520	37.75781	318.10	5.770	-44198.63	0.0010229
540	36.99995	320.92	5.620	-42651.28	0.0010047
560	36.27040	323.74	5.481	-41258.68	0.0009868
580	35.56737	327.16	5.351	-39993.48	0.0009692
600	34.89112	330.57	5.230	-38840.83	0.0009519
650	33.30443	339.83	4.960	-36371.71	0.0009101
700	31.85463	350.06	4.726	-34372.62	0.0008705
750	30.52562	361.17	4.522	-32731.17	0.0008332
800	29.30773	373.08	4.341	-31365.87	0.0007991
850	28.18408	385.71	4.178	-30216.66	0.0007651
900	27.14779	399.00	4.031	-29238.62	0.0007343
950	26.18785	412.39	3.896	-28397.75	0.0007055
1000	25.29745	427.33	3.773	-27667.99	0.0006785
1100	23.69577	457.65	3.553	-26465.44	0.0006299
1200	22.29956	489.60	3.363	-25515.86	0.0005873
1300	21.06695	522.85	3.198	-24746.16	0.0005500
1400	19.97297	557.11	3.054	-24108.28	0.0005171
1500	18.99462	592.12	2.927	-23569.57	0.0004980

* INDICATES TWO PHASE BOUNDARY

18000 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE	DENSITY	$V(DU/DV)$	$V(DP/DU)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*156.515	58.11397	423.65	9.921	-198914.87	0.0007922
160	57.94216	405.71	10.253	-192260.28	0.0003154
165	57.69936	385.49	10.641	-183492.79	0.0008917
170	57.41528	370.20	10.936	-175566.71	0.0007423
175	57.16874	358.55	11.147	-168400.33	0.0009872
180	56.87160	349.65	11.297	-161915.74	0.0010264
185	56.57560	342.92	11.365	-156036.82	0.0010400
190	56.27243	337.59	11.394	-150694.98	0.0010394
195	55.96361	333.57	11.392	-145824.92	0.0011121
200	55.65051	330.50	11.337	-141367.67	0.0011314
205	55.33437	328.13	11.267	-137270.33	0.0011468
210	55.01625	326.44	11.177	-133486.12	0.0011589
215	54.69705	325.15	11.071	-129974.14	0.0011681
220	54.37756	324.22	10.954	-126699.03	0.0011748
225	54.05842	323.57	10.819	-123630.46	0.0011794
230	53.74016	323.13	10.699	-120742.61	0.0011822
235	53.42223	322.97	10.565	-118013.62	0.0011835
240	53.10727	322.73	10.429	-115425.08	0.0011837
245	52.79467	322.70	10.293	-112961.49	0.0011828
250	52.48357	322.74	10.157	-110627.85	0.0011811
260	51.86957	322.97	9.889	-106200.55	0.0011759
270	51.26393	323.33	9.629	-102129.07	0.0011690
280	50.67015	323.75	9.380	-98346.74	0.0011610
290	50.08744	324.19	9.143	-94818.04	0.0011523
300	49.51583	324.64	8.917	-91516.26	0.0011432
320	48.40549	325.55	8.501	-85513.92	0.0011246
340	47.33775	326.50	8.126	-80217.81	0.0011059
360	46.31083	327.53	7.790	-75517.81	0.0010873
380	45.32292	328.71	7.496	-71350.58	0.0010690
400	44.37225	330.07	7.211	-67643.66	0.0010509
420	43.45713	331.63	6.961	-64338.05	0.0010331
440	42.57598	333.41	6.733	-61382.19	0.0010155
460	41.72725	335.41	6.524	-58731.26	0.0009981
480	40.90750	337.63	6.332	-56346.46	0.0009811
500	40.12133	340.06	6.155	-54194.39	0.0009644
520	39.36140	342.70	5.991	-52246.35	0.0009479
540	38.62845	345.53	5.840	-50477.71	0.0009318
560	37.92125	348.56	5.698	-48867.31	0.0009160
580	37.23966	351.76	5.566	-47396.96	0.0009005
600	36.57957	355.14	5.443	-46050.94	0.0008853
650	35.02793	364.29	5.156	-43144.56	0.0008488
700	33.60178	374.38	4.925	-40767.11	0.0008142
750	32.28791	385.33	4.714	-38796.14	0.0007916
800	31.07464	397.07	4.525	-37143.16	0.0007508
850	29.95157	409.55	4.356	-35741.90	0.0007218
900	28.90989	422.71	4.201	-34542.17	0.0006945
950	27.94125	436.49	4.060	-33505.53	0.0006689
1000	27.03850	450.94	3.929	-32602.12	0.0006449
1100	25.40675	481.06	3.697	-31106.48	0.0006011
1200	23.97187	513.00	3.496	-29920.28	0.0005624
1300	22.70046	546.31	3.321	-28956.32	0.0005282
1400	21.56590	580.59	3.168	-28156.43	0.0004978
1500	20.54499	615.87	3.033	-27480.64	0.0004708

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

20000 PSIA ISOBAE

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*160.792	58.49454	436.27	10.149	-211191.46	0.0007494
165	58.30028	415.57	10.530	-203002.03	0.0007990
170	58.06051	397.13	10.873	-194287.76	0.0008496
175	57.80755	383.18	11.134	-186377.92	0.0008960
180	57.54315	372.57	11.311	-179199.99	0.0009369
185	57.26900	364.46	11.422	-172683.03	0.0009725
190	56.98673	358.25	11.477	-166758.62	0.0010031
195	56.69787	353.51	11.486	-161361.71	0.0010289
200	56.40392	349.90	11.459	-156431.60	0.0010503
205	56.10596	347.13	11.404	-151912.47	0.0010677
210	55.80510	345.16	11.325	-147753.81	0.0010817
215	55.50253	343.63	11.229	-143910.51	0.0010925
220	55.19900	342.64	11.120	-140342.74	0.0011006
225	54.89521	341.94	11.002	-137015.75	0.0011065
230	54.59179	341.50	10.876	-133899.42	0.0011103
235	54.28923	341.27	10.747	-130967.87	0.0011125
240	53.98795	341.21	10.614	-128198.97	0.0011133
245	53.68829	341.28	10.480	-125573.90	0.0011130
250	53.39051	341.44	10.346	-123076.70	0.0011117
260	52.80143	341.97	10.091	-118413.87	0.0011069
270	52.22191	342.67	9.823	-114125.45	0.0011001
280	51.65264	343.44	9.576	-110150.39	0.0010919
290	51.09394	344.24	9.339	-106444.41	0.0010830
300	50.54520	345.05	9.114	-102974.74	0.0010737
320	49.48147	346.63	8.698	-96650.39	0.0010546
340	48.45800	348.16	8.324	-91033.68	0.0010356
360	47.47157	349.69	7.989	-86024.92	0.0010170
380	46.52518	351.26	7.685	-81546.60	0.0009989
400	45.61391	352.93	7.411	-77533.89	0.0009814
420	44.73496	354.74	7.161	-73930.62	0.0009644
440	43.89766	356.72	6.933	-70687.55	0.0009479
460	43.07048	358.96	6.724	-67761.37	0.0009319
480	42.28196	361.19	6.531	-65114.18	0.0009160
500	41.52976	363.70	6.353	-62712.87	0.0009007
520	40.78561	366.40	6.188	-60528.63	0.0008853
540	40.07531	369.27	6.035	-58536.45	0.0008712
560	39.39874	372.31	5.892	-56714.64	0.0008569
580	38.72484	375.52	5.759	-55044.35	0.0008430
600	38.09260	378.99	5.634	-53509.22	0.0008294
650	36.56565	387.99	5.352	-50173.56	0.0007968
700	35.16475	398.00	5.106	-47420.14	0.0007661
750	33.86908	408.84	4.899	-45119.69	0.0007371
800	32.66525	420.48	4.695	-43176.66	0.0007097
850	31.54798	432.86	4.520	-41519.17	0.0006839
900	30.50545	445.92	4.359	-40092.34	0.0006594
950	29.53317	459.63	4.212	-38853.69	0.0006364
1000	28.62331	473.92	4.076	-37769.97	0.0006148
1100	26.77165	504.08	3.833	-35967.47	0.0005751
1200	25.51027	536.03	3.622	-34531.29	0.0005397
1300	24.20971	569.41	3.438	-33360.66	0.0005082
1400	23.04206	603.92	3.277	-32387.50	0.0004801
1500	21.99016	639.28	3.135	-31564.54	0.0004549

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

25000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DU)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB P	PSIA-CU FT/BTU V	PSIA T	DEG. R P
*170.811	59.37793	468.49	10.627	-241783.17	0.0006625
175	59.20914	450.71	10.932	-233596.26	0.0007026
180	58.99416	434.35	11.208	-224579.63	0.0007463
185	58.76857	421.94	11.401	-216331.19	0.0007855
190	58.53307	412.45	11.525	-208792.41	0.0009202
195	58.28936	405.70	11.572	-201904.15	0.0008505
200	58.03770	399.64	11.614	-195607.76	0.0008767
205	57.79053	395.42	11.598	-189846.13	0.0008990
210	57.51864	392.24	11.553	-184554.71	0.0009176
215	57.25308	389.98	11.485	-179712.22	0.0009329
220	56.98433	388.18	11.490	-175241.19	0.0009452
225	56.71474	387.00	11.301	-171108.25	0.0009548
230	56.44354	386.25	11.191	-167274.24	0.0009621
235	56.17189	385.93	11.075	-163704.17	0.0009673
240	55.90015	385.69	10.953	-160367.05	0.0009708
245	55.62917	385.76	10.828	-157235.61	0.0009727
250	55.35924	386.01	10.702	-154286.04	0.0009734
260	54.82342	386.89	10.448	-148852.45	0.0009716
270	54.29452	388.10	10.198	-143932.01	0.0009668
280	53.77398	389.50	9.955	-139424.96	0.0009600
290	53.26225	391.00	9.722	-135257.55	0.0009518
300	52.76002	392.54	9.500	-131375.13	0.0009429
320	51.78412	395.57	9.089	-124312.37	0.0009240
340	50.84566	398.47	8.718	-118014.56	0.0009049
360	49.94296	401.20	8.396	-112346.19	0.0008865
380	49.07394	403.81	8.095	-107216.40	0.0008690
400	48.23652	406.35	7.813	-102558.09	0.0008523
420	47.42873	408.87	7.566	-98317.57	0.0008366
440	46.64879	411.41	7.340	-94449.56	0.0008216
460	45.89597	414.01	7.132	-90914.72	0.0008074
480	45.16610	416.69	6.940	-87678.30	0.0007938
500	44.46057	419.47	6.762	-84709.43	0.0007807
520	43.77726	422.37	6.598	-81980.65	0.0007682
540	43.11598	425.39	6.444	-79467.54	0.0007561
560	42.47302	428.54	6.300	-77148.41	0.0007444
580	41.85014	431.82	6.165	-75004.00	0.0007331
600	41.24559	435.23	6.038	-73017.23	0.0007221
650	39.80922	444.76	5.750	-68644.75	0.0006960
700	38.47126	454.30	5.497	-64973.60	0.0006717
750	37.22213	465.05	5.271	-61858.91	0.0006488
800	36.05352	476.57	5.067	-59191.28	0.0006273
850	34.95816	488.82	4.882	-56886.93	0.0006070
900	33.92962	501.79	4.711	-54880.84	0.0005877
950	32.96221	515.41	4.553	-53121.90	0.0005695
1000	32.05093	529.65	4.407	-51569.45	0.0005522
1100	30.37825	559.91	4.143	-48959.59	0.0005202
1200	28.88079	591.89	3.912	-46856.38	0.0004913
1300	27.53253	625.52	3.709	-45128.07	0.0004653
1400	26.31244	660.38	3.530	-43683.21	0.0004416
1500	25.20397	696.17	3.372	-42456.85	0.0004202

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

30000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*180.465	60.19016	504.26	10.910	-272056.89	0.0005952
185	60.01287	487.36	11.164	-262961.46	0.0006320
190	59.81789	472.98	11.365	-253685.18	0.0006691
195	59.61306	461.95	11.498	-245150.62	0.0007023
200	59.39940	453.45	11.575	-237307.27	0.0007319
205	59.17858	446.88	11.607	-230103.32	0.0007579
210	58.95143	441.81	11.602	-223486.74	0.0007805
215	58.71990	437.94	11.569	-217406.32	0.0007999
220	58.48208	435.01	11.513	-211812.47	0.0008162
225	58.24197	432.85	11.439	-206657.98	0.0008297
230	57.99909	431.31	11.352	-201899.52	0.0008407
235	57.75447	430.27	11.254	-197492.96	0.0008495
240	57.50867	429.65	11.148	-193403.57	0.0008562
245	57.26225	429.36	11.037	-189596.11	0.0008612
250	57.01570	429.34	10.922	-186039.69	0.0008645
260	56.52389	429.95	10.687	-179572.66	0.0008674
270	56.03572	431.16	10.450	-173817.05	0.0008662
280	55.55367	432.75	10.218	-168628.88	0.0008621
290	55.07940	434.58	9.993	-163897.92	0.0008560
300	54.61020	436.54	9.777	-159539.89	0.0008486
320	53.70030	440.59	9.374	-151703.93	0.0008316
340	52.82449	444.59	9.010	-144772.90	0.0008136
360	51.98113	448.40	8.682	-138540.65	0.0007959
380	51.16904	452.00	8.386	-132879.07	0.0007789
400	50.38628	455.42	8.118	-127702.94	0.0007629
420	49.63090	458.70	7.874	-122951.11	0.0007478
440	48.90107	461.88	7.651	-118576.42	0.0007337
460	48.19515	465.01	7.447	-114540.33	0.0007205
480	47.51162	468.14	7.258	-110810.02	0.0007080
500	46.84915	471.28	7.082	-107356.80	0.0006962
520	46.20655	474.46	6.919	-104155.17	0.0006850
540	45.58273	477.71	6.767	-101182.33	0.0006743
560	44.97672	481.04	6.624	-98417.76	0.0006641
580	44.38754	484.46	6.490	-95842.97	0.0006543
600	43.81469	487.98	6.363	-93441.30	0.0006449
650	42.44819	497.26	6.074	-88099.56	0.0006223
700	41.16900	507.29	5.819	-83552.86	0.0006024
750	39.96578	518.04	5.599	-79648.86	0.0005833
800	38.83442	529.55	5.380	-76269.32	0.0005655
850	37.76779	541.81	5.199	-73321.89	0.0005487
900	36.76052	554.77	5.012	-70733.35	0.0005328
950	35.80786	568.42	4.847	-68445.82	0.0005177
1000	34.90556	582.70	4.694	-66412.42	0.0005033
1100	33.23724	613.01	4.415	-62962.80	0.0004766
1200	31.72931	645.32	4.169	-60154.38	0.0004524
1300	30.36010	679.77	3.952	-57828.32	0.0004302
1400	29.11154	714.52	3.759	-55872.13	0.0004100
1500	27.96842	750.76	3.589	-54204.44	0.0003915

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

35000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV) BTU/LB	V(OP/DH) PSIA-CU FT/BTU	V(OP/DV) PSIA	(DV/DT) /V DEG. R
*199.725	60.91907	544.61	11.000	-301950.24	0.0005378
190	60.70896	543.56	11.013	-301363.87	0.0005418
195	60.73993	526.92	11.222	-291128.23	0.0005765
200	60.55913	514.05	11.363	-281653.95	0.0006081
205	60.37099	504.02	11.450	-272877.74	0.0006366
210	60.17514	496.17	11.494	-264814.13	0.0006620
215	59.97256	490.02	11.502	-257356.35	0.0006844
220	59.76497	485.21	11.482	-250477.32	0.0007040
225	59.55238	481.48	11.440	-244130.43	0.0007210
230	59.33549	478.64	11.380	-238270.34	0.0007354
235	59.11678	476.50	11.306	-232853.51	0.0007475
240	58.89423	474.96	11.222	-227838.68	0.0007574
245	58.67039	473.91	11.129	-223187.20	0.0007655
250	58.44531	473.27	11.031	-218863.22	0.0007717
260	57.99738	472.94	10.823	-211068.84	0.0007798
270	57.54175	473.56	10.607	-204226.13	0.0007831
280	57.09288	474.94	10.391	-198148.62	0.0007927
290	56.64857	476.57	10.179	-192637.63	0.0007795
300	56.21006	478.58	9.972	-187726.15	0.0007744
320	55.35342	483.08	9.584	-178957.06	0.0007607
340	54.52626	487.78	9.229	-171330.25	0.0007447
360	53.72903	492.41	8.909	-164537.44	0.0007292
380	52.96080	496.84	8.619	-158389.32	0.0007121
400	52.22002	501.06	8.356	-152765.41	0.0006767
420	51.50496	505.07	8.117	-147585.17	0.0006923
440	50.81388	508.91	7.898	-142791.46	0.0006688
460	50.14515	512.62	7.697	-138341.24	0.0006562
480	49.49728	516.23	7.512	-134200.27	0.0006444
500	48.86992	519.79	7.340	-130340.06	0.0006333
520	48.25988	523.33	7.179	-126736.08	0.0006229
540	47.66607	526.97	7.029	-123366.79	0.0006131
560	47.08954	530.44	6.889	-120212.90	0.0006039
580	46.52841	534.06	6.756	-117257.05	0.0005950
600	45.98191	537.74	6.631	-114483.50	0.0005866
650	44.67516	547.30	6.345	-108256.29	0.0005670
700	43.44612	557.47	6.090	-102891.01	0.0005491
750	42.28712	568.33	5.859	-98235.40	0.0005326
800	41.19177	579.91	5.649	-94167.99	0.0005173
850	40.15465	592.22	5.454	-90591.55	0.0005029
900	39.17106	605.25	5.273	-87427.85	0.0004893
950	38.23688	618.96	5.104	-84613.54	0.0004764
1000	37.34947	633.34	4.946	-82096.96	0.0004641
1100	35.69618	663.88	4.657	-77794.62	0.0004412
1200	34.19144	696.49	4.400	-74260.74	0.0004203
1300	32.81613	730.80	4.171	-71312.75	0.0004012
1400	31.55394	766.46	3.968	-68819.34	0.0003835
1500	30.39173	803.15	3.787	-66684.20	0.0003673

* INDICATES TWO PHASE BOUNDARY

40000 PSIA ISOBAR

THERMODYNAMIC PROPERTIES OF NITROGEN

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DU) / V
DEG. R	LB/CU FT	RTU/LB P	PSIA-CU FT/RTU V	PSIA T	DEG. R P
*198.638	61.60412	589.49	10.937	-331478.40	0.0004927
200	61.56744	584.68	10.989	-328528.95	0.0005013
205	61.40370	569.56	11.142	-318184.51	0.0005311
210	61.23664	557.65	11.241	-308574.71	0.0005582
215	61.04215	548.19	11.299	-299659.43	0.0005828
220	60.88108	540.66	11.322	-291396.79	0.0006047
225	60.69425	534.66	11.313	-283743.87	0.0006243
230	60.50244	529.88	11.291	-276657.53	0.0006414
235	60.30542	526.11	11.248	-270095.05	0.0006563
240	60.10696	523.17	11.190	-264014.74	0.0006691
245	59.90443	520.91	11.121	-258376.40	0.0006800
250	59.69970	519.23	11.043	-253141.74	0.0006891
260	59.28551	517.25	10.870	-243741.30	0.0007024
270	58.86799	516.66	10.693	-235553.08	0.0007103
280	58.45008	517.08	10.489	-228355.86	0.0007139
290	58.03404	518.23	10.295	-221966.10	0.0007142
300	57.62155	519.88	10.103	-216234.17	0.0007120
320	56.81168	524.15	9.735	-206286.95	0.0007026
340	56.02615	529.05	9.395	-197818.29	0.0006894
360	55.26704	534.14	9.085	-190392.86	0.0006747
380	54.53444	539.15	8.803	-183738.51	0.0006598
400	53.82743	544.01	8.546	-177687.63	0.0006453
420	53.14464	548.66	8.313	-172112.72	0.0006315
440	52.48453	553.10	8.079	-166952.61	0.0006185
460	51.84559	557.36	7.902	-162148.36	0.0006065
480	51.22639	561.48	7.720	-157659.82	0.0005952
500	50.62562	565.48	7.552	-153455.65	0.0005847
520	50.04208	569.41	7.395	-149510.28	0.0005748
540	49.47470	573.28	7.248	-145802.12	0.0005656
560	48.92253	577.14	7.110	-142312.41	0.0005569
580	48.38470	581.00	6.979	-139024.53	0.0005486
600	47.86044	584.89	6.856	-135923.56	0.0005409
650	46.60475	594.83	6.574	-128902.85	0.0005230
700	45.42050	605.25	6.322	-122786.83	0.0005069
750	44.30037	616.28	6.092	-117428.23	0.0004922
800	43.23840	627.98	5.882	-112706.91	0.0004786
850	42.22961	640.40	5.686	-108524.60	0.0004659
900	41.26974	653.53	5.504	-104800.60	0.0004539
950	40.35511	667.35	5.332	-101468.44	0.0004426
1000	39.48248	681.84	5.170	-98473.12	0.0004319
1100	37.85195	712.66	4.874	-93317.43	0.0004119
1200	36.35828	745.62	4.609	-89049.23	0.0003936
1300	34.98505	780.32	4.372	-85465.54	0.0003767
1400	33.71838	816.41	4.160	-82418.42	0.0003611
1500	32.54643	853.57	3.970	-79797.95	0.0003466

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

45000 PSIA ISORAP

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB P	PSIA-CU FT/RTU V	PSIA T	DEG. R P
*207.245	62.24776	638.54	10.769	-360680.19	0.0004519
210	62.16931	629.18	10.853	-354634.73	0.0004670
215	62.01997	614.03	10.948	-344237.39	0.0004927
220	61.86346	603.48	11.042	-334548.06	0.0005163
225	61.70093	594.23	11.083	-325529.04	0.0005376
230	61.53220	586.72	11.096	-317141.31	0.0005568
235	61.35847	580.63	11.087	-309345.14	0.0005739
240	61.18030	575.68	11.061	-302100.73	0.0005890
245	60.99832	571.70	11.020	-295368.71	0.0006022
250	60.81314	568.51	10.968	-289110.66	0.0006137
260	60.43529	564.06	10.839	-277869.51	0.0006318
270	60.05048	561.59	10.686	-268100.94	0.0006442
280	59.66254	560.56	10.521	-259560.14	0.0006520
290	59.27348	560.60	10.350	-252036.02	0.0006559
300	58.88555	561.44	10.177	-245350.47	0.0006569
320	58.11894	564.73	9.838	-233930.70	0.0006524
340	57.37030	569.26	9.518	-224415.78	0.0006426
360	56.64438	574.36	9.221	-216227.73	0.0006303
380	55.94230	579.64	8.949	-208994.26	0.0006170
400	55.26415	584.90	8.701	-202475.26	0.0006036
420	54.60815	590.02	8.473	-196514.35	0.0005906
440	53.97351	594.96	8.264	-191006.73	0.0005783
460	53.35920	599.72	8.072	-185880.70	0.0005667
480	52.76361	604.30	7.895	-181095.14	0.0005559
500	52.18560	608.74	7.730	-176582.17	0.0005458
520	51.62401	613.05	7.576	-172342.54	0.0005363
540	51.07778	617.28	7.432	-168342.77	0.0005275
560	50.54538	621.45	7.297	-164563.34	0.0005192
580	50.02775	625.59	7.170	-160987.51	0.0005114
600	49.52232	629.72	7.049	-157600.64	0.0005041
650	48.31038	640.13	6.772	-149877.41	0.0004874
700	47.16524	650.88	6.523	-143083.03	0.0004725
750	46.07974	662.15	6.296	-137076.99	0.0004591
800	45.04817	674.03	6.087	-131743.35	0.0004467
850	44.06580	686.60	5.891	-126985.55	0.0004353
900	43.12868	699.86	5.708	-122722.96	0.0004246
950	42.23341	713.83	5.535	-118887.96	0.0004145
1000	41.37793	728.46	5.372	-115423.76	0.0004050
1100	39.77078	759.59	5.071	-109423.61	0.0003972
1200	38.29208	792.91	4.799	-104420.46	0.0003708
1300	36.92623	828.01	4.556	-100194.72	0.0003558
1400	35.66093	864.54	4.337	-96584.00	0.0003418
1500	34.48527	902.16	4.140	-93466.31	0.0003289

* INDICATES TWO PHASE BOUNDARY

THEPMDYDAMIC PROPERTIES OF NITROGEN

50000 PSIA ISORAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DU) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*215.576	62.85591	691.37	10.533	-382597.34	0.0004158
220	62.73716	676.39	10.649	-379776.86	0.0004373
225	62.59676	662.48	10.740	-369394.18	0.0004598
230	62.44976	651.11	10.800	-359672.59	0.0004803
235	62.29770	641.76	10.832	-350596.47	0.0004990
240	62.13910	634.04	10.842	-342129.30	0.0005159
245	61.97644	627.66	10.835	-334234.11	0.0005310
250	61.81020	622.39	10.812	-326874.05	0.0005444
260	61.46749	614.51	10.734	-313614.63	0.0005666
270	61.11491	609.35	10.624	-302072.20	0.0005831
280	60.75584	606.21	10.493	-291990.06	0.0005947
290	60.39312	604.59	10.350	-283138.87	0.0006023
300	60.02907	604.12	10.201	-275318.59	0.0006065
320	59.30403	605.60	9.899	-262113.34	0.0006073
340	58.50130	609.12	9.602	-251312.42	0.0006015
360	57.89567	613.75	9.324	-242190.43	0.0005919
380	57.22057	618.92	9.065	-234263.54	0.0005806
400	56.56693	624.29	8.826	-227211.97	0.0005686
420	55.93392	629.67	8.606	-220823.86	0.0005566
440	55.32117	634.95	8.403	-214957.37	0.0005450
460	54.72752	640.09	8.216	-209515.82	0.0005340
480	54.15193	645.07	8.043	-204431.75	0.0005236
500	53.59298	649.89	7.882	-199656.73	0.0005139
520	53.04997	654.58	7.732	-195154.80	0.0005049
540	52.52150	659.15	7.592	-190898.37	0.0004963
560	52.00694	663.64	7.459	-186865.51	0.0004883
580	51.50537	668.06	7.335	-183038.21	0.0004809
600	51.01601	672.45	7.216	-179401.24	0.0004738
650	49.84177	683.40	6.944	-171058.65	0.0004580
700	48.73079	694.55	6.700	-163656.91	0.0004440
750	47.67604	706.12	6.476	-157061.46	0.0004315
800	46.67191	718.24	6.269	-151161.46	0.0004201
850	45.71295	731.01	6.075	-145863.79	0.0004097
900	44.79906	744.45	5.892	-141099.61	0.0003999
950	43.92136	758.57	5.719	-136771.85	0.0003907
1000	43.08099	773.37	5.555	-132853.34	0.0003821
1100	41.49991	804.85	5.250	-126025.76	0.0003660
1200	40.03819	838.55	4.974	-120293.81	0.0003513
1300	38.68277	874.06	4.725	-115425.43	0.0003377
1400	37.42231	911.03	4.500	-111246.37	0.0003250
1500	36.24721	949.10	4.298	-107624.09	0.0003132

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

60000 PSIA ISOTHERMS

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. P	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*231.515	63.98574	807.15	9.962	-446720.13	0.0003553
235	63.90498	793.24	10.052	-439672.99	0.0003694
240	63.78402	776.14	10.152	-427709.52	0.0003893
245	63.65750	761.93	10.226	-417404.32	0.0004057
250	63.52592	749.92	10.276	-407776.21	0.0004218
260	63.24943	731.11	10.322	-390123.51	0.0004497
270	62.95916	717.50	10.315	-374744.81	0.0004725
280	62.65542	707.57	10.270	-361038.23	0.0004907
290	62.34416	700.69	10.200	-349064.29	0.0005047
300	62.02696	695.88	10.111	-338501.83	0.0005149
320	61.38328	690.97	9.901	-320832.23	0.0005265
340	60.73794	690.32	9.672	-306697.64	0.0005292
360	60.09992	692.31	9.442	-295104.03	0.0005262
380	59.47427	695.93	9.218	-285337.83	0.0005197
400	58.86420	700.50	9.005	-276898.71	0.0005112
420	58.27090	705.59	8.895	-269439.96	0.0005018
440	57.69466	710.94	8.618	-262722.09	0.0004920
460	57.13520	716.37	8.444	-256579.13	0.0004824
480	56.59189	721.79	8.291	-250895.08	0.0004731
500	56.06394	727.14	8.129	-245537.84	0.0004642
520	55.55051	732.39	7.937	-240538.35	0.0004559
540	55.05075	737.53	7.853	-235883.29	0.0004480
560	54.56385	742.58	7.727	-231410.19	0.0004405
580	54.08902	747.55	7.608	-227154.07	0.0004336
600	53.62557	752.45	7.495	-223095.26	0.0004270
650	52.51253	764.54	7.234	-213713.51	0.0004123
700	51.45786	776.62	6.999	-205284.91	0.0003995
750	50.45464	788.95	6.782	-197676.39	0.0003882
800	49.49738	801.69	6.590	-190784.18	0.0003781
850	48.58166	814.98	6.390	-184522.62	0.0003690
900	47.70387	828.88	6.210	-178818.79	0.0003605
950	46.86102	843.44	6.038	-173609.67	0.0003526
1000	46.05058	858.64	5.874	-168840.39	0.0003453
1100	44.51848	890.92	5.566	-160435.47	0.0003317
1200	43.09314	925.43	5.295	-153287.11	0.0003193
1300	41.76305	961.90	5.029	-147150.91	0.0003079
1400	40.51956	999.64	4.796	-141837.25	0.0002972
1500	39.35185	1038.62	4.595	-137197.96	0.0002873

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

70000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*246.626	65.02356	935.01	9.358	-503067.55	0.0003064
250	64.95579	918.54	9.457	-495040.72	0.0003180
260	64.73854	879.38	9.657	-472981.37	0.0003492
270	64.50402	850.75	9.780	-453333.57	0.0003760
280	64.25447	829.40	9.843	-435871.50	0.0003986
290	63.99747	813.31	9.862	-420370.03	0.0004173
300	63.72116	801.16	9.850	-406610.91	0.0004325
320	63.15784	785.30	9.761	-383508.76	0.0004536
340	62.57965	777.12	9.621	-365101.61	0.0004647
360	61.99764	773.89	9.455	-350208.47	0.0004687
380	61.41845	773.90	9.280	-337917.48	0.0004677
400	60.84997	776.05	9.104	-327549.42	0.0004634
420	60.29214	779.56	8.932	-318608.99	0.0004573
440	59.74753	783.95	8.767	-310739.50	0.0004500
460	59.21479	788.87	8.609	-303685.54	0.0004422
480	58.70000	794.09	8.460	-297264.25	0.0004343
500	58.19686	799.46	8.319	-291344.28	0.0004265
520	57.70591	804.89	8.186	-285910.59	0.0004190
540	57.22953	810.32	8.050	-280653.76	0.0004119
560	56.76411	815.72	7.941	-275762.47	0.0004049
580	56.31000	821.07	7.828	-271118.28	0.0003984
600	55.86657	826.28	7.720	-266691.90	0.0003923
650	54.80098	839.50	7.471	-256441.27	0.0003784
700	53.79038	852.55	7.244	-247174.87	0.0003664
750	52.82910	865.73	7.035	-238739.55	0.0003559
800	51.90874	879.22	6.839	-231024.40	0.0003465
850	51.02793	893.18	6.654	-223949.36	0.0003382
900	50.18215	907.68	6.477	-217445.23	0.0003305
950	49.36847	922.79	6.309	-211453.76	0.0003235
1000	48.58446	938.51	6.145	-205924.07	0.0003169
1100	47.09746	971.75	5.838	-196075.16	0.0003050
1200	45.70772	1007.18	5.555	-187594.64	0.0002942
1300	44.40481	1044.45	5.295	-180240.06	0.0002843
1400	43.18023	1083.70	5.056	-173817.13	0.0002751
1500	42.02645	1123.08	4.839	-168169.75	0.0002665

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

90000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	DEG. R
*261.033	65.98443	1074.07	8.774	-558771.75	0.0002662
270	65.82357	1024.19	9.024	-537540.61	0.0002920
280	65.62315	982.54	9.219	-516137.46	0.0003173
290	65.40786	951.09	9.349	-496939.19	0.0003493
300	65.18034	926.95	9.429	-479744.26	0.0003580
320	64.60570	893.65	9.497	-450581.35	0.0003966
340	64.18414	873.59	9.455	-427176.39	0.0004051
360	63.65969	861.97	9.373	-408254.23	0.0004157
380	63.12909	855.98	9.260	-392767.21	0.0004204
400	62.59898	853.79	9.131	-379888.19	0.0004208
420	62.07552	854.21	8.925	-368982.60	0.0004184
440	61.56083	856.41	8.859	-359573.08	0.0004140
460	61.05651	859.82	8.723	-351304.97	0.0004085
480	60.56343	864.04	8.591	-343916.49	0.0004023
500	60.09134	868.78	8.465	-337214.86	0.0003959
520	59.61701	873.87	8.343	-331058.01	0.0003974
540	59.15339	879.17	8.227	-325340.78	0.0003930
560	58.70571	884.58	8.116	-319984.95	0.0003768
580	58.26850	890.07	8.009	-314931.83	0.0003708
600	57.84130	895.58	7.908	-310137.05	0.0003651
650	56.81385	909.41	7.673	-299075.86	0.0003521
700	55.83863	923.29	7.453	-289080.01	0.0003407
750	54.90940	937.30	7.251	-279945.25	0.0003308
800	54.02093	951.59	7.061	-271542.88	0.0003219
850	53.16895	966.29	6.831	-263783.09	0.0003141
900	52.34939	981.49	6.708	-256597.42	0.0003070
950	51.56114	997.23	6.541	-249930.08	0.0003005
1000	50.80002	1013.55	6.381	-243733.53	0.0002945
1100	49.35317	1047.92	6.076	-232590.45	0.0002837
1200	47.99650	1084.39	5.793	-222884.31	0.0002740
1300	46.72016	1122.65	5.530	-214383.73	0.0002652
1400	45.51532	1162.35	5.289	-206898.26	0.0002570
1500	44.37848	1203.16	5.067	-200270.69	0.0002494

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

90000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT)/V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*274.835	66.89418	1224.14	8.227	-613903.70	0.0002326
280	66.81151	1186.16	8.399	-601155.61	0.0002461
290	66.63915	1127.61	8.662	-578255.99	0.0002700
300	66.45229	1083.35	8.854	-557553.90	0.0002911
320	66.04298	1022.28	9.096	-522018.17	0.0003252
340	65.59749	984.13	9.183	-493140.68	0.0003497
360	65.12899	959.98	9.198	-469633.27	0.0003662
380	64.64671	944.99	9.160	-450378.26	0.0003762
400	64.15949	936.22	9.089	-434446.32	0.0003812
420	63.66997	931.78	8.998	-421089.84	0.0003826
440	63.18514	930.38	8.897	-409722.07	0.0003814
460	62.70669	931.13	8.789	-399890.50	0.0003784
480	62.23634	933.41	8.680	-391250.21	0.0003743
500	61.77510	936.77	8.571	-383540.12	0.0003695
520	61.32347	940.88	8.464	-376563.27	0.0003642
540	60.88163	945.52	8.359	-370171.13	0.0003589
560	60.44951	950.53	8.258	-364251.52	0.0003534
580	60.02691	955.79	8.160	-358719.40	0.0003481
600	59.61353	961.23	8.065	-353509.98	0.0003430
650	58.61803	975.28	7.841	-341599.46	0.0003309
700	57.67207	989.70	7.634	-330906.78	0.0003201
750	56.77096	1004.42	7.440	-321145.43	0.0003106
800	55.90713	1019.46	7.256	-312145.99	0.0003022
850	55.07916	1034.90	7.080	-303799.73	0.0002947
900	54.28273	1050.82	6.911	-296030.59	0.0002880
950	53.51499	1067.27	6.748	-298780.92	0.0002819
1000	52.77356	1084.26	6.590	-282004.08	0.0002763
1100	51.36196	1119.88	6.298	-269715.25	0.0002662
1200	50.03522	1157.52	6.005	-258898.65	0.0002574
1300	48.78379	1196.86	5.742	-249337.71	0.0002493
1400	47.60023	1237.58	5.499	-240851.00	0.0002420
1500	46.47846	1279.35	5.275	-233285.44	0.0002351

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

100000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT)/V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*299.106	67.74978	1385.48	7.721	-668496.24	0.0002043
290	67.72328	1367.31	7.793	-663659.58	0.0002099
300	67.57426	1287.18	8.119	-639487.65	0.0002313
320	67.23583	1180.28	8.557	-597500.85	0.0002692
340	66.85444	1114.35	8.805	-562900.54	0.0002933
360	66.44199	1071.79	8.933	-534437.73	0.0003195
380	66.00825	1043.88	8.983	-510979.34	0.0003343
400	65.56176	1025.77	8.990	-491540.35	0.0003437
420	65.10991	1014.31	8.943	-475293.89	0.0003489
440	64.65458	1007.66	8.884	-461564.80	0.0003509
460	64.20235	1004.45	8.811	-449813.46	0.0003507
480	63.75473	1003.73	8.729	-439615.20	0.0003488
500	63.31340	1004.82	8.642	-430639.47	0.0003457
520	62.87944	1007.24	8.552	-422630.57	0.0003420
540	62.45347	1010.63	8.462	-415391.83	0.0003377
560	62.03580	1014.73	8.373	-408771.85	0.0003333
580	61.62649	1019.36	8.284	-402654.17	0.0003287
600	61.22549	1024.37	8.193	-396949.00	0.0003241
650	60.25795	1038.01	7.990	-384072.12	0.0003131
700	59.33699	1052.60	7.793	-372650.58	0.0003031
750	58.45799	1067.78	7.607	-362292.35	0.0002941
800	57.61654	1083.44	7.430	-352735.81	0.0002860
850	56.80979	1099.57	7.259	-343869.48	0.0002789
900	56.03143	1116.21	7.094	-335590.81	0.0002724
950	55.28168	1133.37	6.934	-327834.66	0.0002665
1000	54.55719	1151.07	6.779	-320551.72	0.0002612
1100	53.17637	1188.03	6.479	-307252.86	0.0002517
1200	51.87637	1226.92	6.198	-295439.27	0.0002434
1300	50.64780	1267.43	5.935	-284908.32	0.0002360
1400	49.48341	1309.23	5.690	-275489.82	0.0002292
1500	48.37740	1352.02	5.464	-267037.97	0.0002229

* INDICATES TWO PHASE BOUNDARY

110000 PSIA 1500AR

* INDICATES TWO PHASE BOUNDARY

THEPMDYDYNAMIC PROPERTIES OF NITROGEN

120000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*313.291	69.33839	1744.91	6.819	-776090.47	0.0001593
320	69.26120	1655.08	7.100	-758771.97	0.0001726
340	68.99786	1471.10	7.723	-712597.50	0.0002072
360	68.69252	1359.10	8.137	-673725.37	0.0002352
380	68.35449	1286.05	8.491	-641088.39	0.0002571
400	67.99204	1236.60	8.567	-613694.91	0.0002737
420	67.61231	1202.53	8.663	-590653.71	0.0002857
440	67.22170	1179.02	8.710	-571186.83	0.0002939
460	66.82353	1163.00	8.722	-554631.69	0.0002990
480	66.42304	1152.44	8.709	-540435.33	0.0003018
500	66.02260	1145.92	8.678	-528143.63	0.0003027
520	65.62436	1142.42	8.635	-517388.19	0.0003022
540	65.22996	1141.23	8.583	-507872.88	0.0003007
560	64.84018	1141.78	8.525	-499361.17	0.0002984
580	64.45605	1143.68	8.462	-491664.86	0.0002957
600	64.07790	1146.61	8.397	-484634.59	0.0002927
650	63.16005	1157.13	8.229	-469254.25	0.0002844
700	62.28150	1170.54	8.060	-456082.25	0.0002760
750	61.44027	1185.67	7.893	-444391.46	0.0002681
800	60.63346	1201.94	7.729	-433760.53	0.0002608
850	59.85803	1219.07	7.569	-423938.25	0.0002542
900	59.11112	1236.91	7.412	-414769.39	0.0002482
950	58.39019	1255.39	7.258	-406153.83	0.0002427
1000	57.69332	1274.46	7.107	-398023.61	0.0002378
1100	56.76255	1314.19	6.816	-383035.87	0.0002291
1200	55.10735	1355.75	6.538	-369532.01	0.0002215
1300	53.91816	1398.79	6.276	-357322.17	0.0002149
1400	52.78788	1442.96	6.030	-346255.50	0.0002089
1500	51.71093	1487.94	5.802	-336203.47	0.0002034

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

130000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) / V
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*325.296	70.08155	1945.31	6.413	-829079.15	0.0001413
340	69.92241	1732.54	7.019	-791775.49	0.0001673
360	69.66709	1552.93	7.602	-747662.17	0.0001975
380	69.37488	1440.16	7.997	-710263.47	0.0002219
400	69.05172	1364.97	8.263	-678615.68	0.0002413
420	68.71069	1313.12	8.438	-651830.14	0.0002560
440	68.35138	1276.75	8.549	-629110.06	0.0002669
460	67.98241	1251.15	8.613	-609758.46	0.0002746
480	67.60646	1233.27	8.642	-593178.40	0.0002796
500	67.22736	1221.03	8.646	-578867.56	0.0002824
520	66.84768	1213.15	8.631	-566409.16	0.0002837
540	66.46940	1208.46	8.602	-555461.18	0.0002836
560	66.09197	1206.24	8.564	-545745.27	0.0002827
580	65.72243	1205.95	8.517	-537036.24	0.0002810
600	65.35553	1207.16	8.466	-529152.65	0.0002788
650	64.46127	1214.80	8.323	-512166.89	0.0002721
700	63.60188	1226.74	8.171	-497904.38	0.0002647
750	62.77701	1241.24	8.015	-485434.79	0.0002575
800	61.98476	1257.40	7.860	-474211.18	0.0002506
850	61.22264	1274.75	7.706	-463905.47	0.0002443
900	60.48815	1293.02	7.553	-454315.73	0.0002386
950	59.77893	1312.04	7.403	-445313.64	0.0002333
1000	59.09287	1331.73	7.254	-436814.49	0.0002285
1100	57.78303	1372.80	6.965	-421107.29	0.0002200
1200	56.54649	1415.72	6.690	-406885.31	0.0002128
1300	55.37405	1460.08	6.429	-393953.40	0.0002064
1400	54.25864	1505.50	6.184	-382165.53	0.0002007
1500	53.19472	1551.64	5.954	-371400.49	0.0001955

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

140000 PSIA ISOBAR

TEMPERATURE	DENSITY	V(DH/DV)	V(DP/DU)	V(DP/DV)	(DV/DT) /V
DEG. R	LB/CU FT	BTU/LB P	PSIA-CU FT/RTU V	PSIA T	DEG. R P
*316.059	70.79590	2161.61	6.033	-981511.92	0.0001256
340	70.76919	2098.16	6.191	-873333.28	0.0001309
360	70.56020	1802.29	6.969	-824040.78	0.0001626
380	70.31109	1627.92	7.513	-781864.90	0.0001990
400	70.03107	1515.48	7.993	-745879.33	0.0002106
420	69.72432	1439.07	8.158	-715212.11	0.0002277
440	69.39785	1385.53	8.340	-689063.58	0.0002410
460	69.05693	1347.40	8.461	-666717.72	0.0002509
480	68.70603	1320.11	8.538	-647546.97	0.0002581
500	68.34992	1300.70	8.590	-631011.23	0.0002629
520	67.98926	1287.14	8.597	-616652.84	0.0002658
540	67.62668	1278.00	8.595	-604088.76	0.0002672
560	67.26598	1272.26	8.578	-593001.62	0.0002675
580	66.90722	1269.15	8.551	-583130.36	0.0002670
600	66.55172	1268.10	8.515	-574261.51	0.0002657
650	65.68102	1271.92	8.401	-555412.01	0.0002607
700	64.84020	1281.72	8.269	-539886.60	0.0002545
750	64.03076	1295.14	8.126	-526530.48	0.0002480
800	63.25189	1310.99	7.990	-514653.06	0.0002416
850	62.50180	1328.23	7.832	-503835.65	0.0002356
900	61.77830	1346.76	7.694	-493819.49	0.0002301
950	61.07954	1366.22	7.538	-484440.86	0.0002250
1000	60.40328	1386.45	7.392	-475593.13	0.0002204
1100	59.11166	1428.78	7.197	-459224.57	0.0002122
1200	57.89170	1473.05	6.834	-444351.91	0.0002051
1300	56.73428	1518.74	6.573	-430764.96	0.0001989
1400	55.63237	1565.43	6.327	-418318.14	0.0001934
1500	54.58044	1612.77	6.098	-406895.38	0.0001884

* INDICATES TWO PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

150000 PSIA, ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)$	$V(DP/DV)$	$V(DP/DV)$	$(DV/DT) / V$
DEG. R	LB/CU FT	RTU/LB	PSIA-CU FT/RTU	PSIA	DEG. R
*348.300	71.48420	2395.91	5.673	-933373.76	0.0001117
360	71.38302	2139.97	6.228	-902552.12	0.0001303
380	71.17690	1864.60	6.946	-855630.25	0.0001592
400	70.93431	1696.27	7.455	-815277.01	0.0001816
420	70.66362	1585.17	7.820	-780645.77	0.0002003
440	70.36974	1508.33	8.092	-750945.49	0.0002161
460	70.05697	1453.81	8.267	-725453.54	0.0002281
480	69.73145	1414.43	8.395	-703523.44	0.0002372
500	69.39650	1385.88	8.481	-684587.41	0.0002438
520	69.05564	1365.26	8.534	-668154.85	0.0002484
540	68.71123	1350.59	8.561	-653907.47	0.0002513
560	68.36550	1340.45	8.569	-641192.69	0.0002529
580	68.02008	1333.94	8.563	-630015.87	0.0002535
600	67.67626	1329.97	8.544	-620032.50	0.0002532
650	66.82941	1328.90	8.464	-599057.50	0.0002501
700	66.00699	1335.83	8.353	-582085.63	0.0002450
750	65.21242	1347.74	8.226	-567721.33	0.0002393
800	64.44613	1362.72	8.070	-555114.73	0.0002335
850	63.70712	1379.82	7.949	-543743.76	0.0002279
900	62.99374	1398.44	7.807	-533283.22	0.0002226
950	62.30418	1418.21	7.664	-523526.87	0.0002177
1000	61.63667	1438.89	7.522	-514341.02	0.0002132
1100	60.36124	1482.38	7.241	-497352.98	0.0002052
1200	59.15604	1527.95	6.969	-481884.72	0.0001983
1300	58.01211	1574.96	6.709	-467701.47	0.0001923
1400	56.92243	1622.94	6.464	-454652.23	0.0001870
1500	55.88149	1671.50	6.234	-442623.62	0.0001822