NBS TECHNICAL NOTE 648

THERMOPHYSICAL PROPERTIES OF NITROGEN FROM THE FUSION LINE TO 3500 R (1944 K) FOR PRESSURES TO 150,000 PSIA (10342×10^5 N/m^2)

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THERMOPHYSICAL PROPERTIES OF NITROGEN FROM THE FUSION LINE TO 3500 R (1944 K) FOR PRESSURES TO 150,000 PSIA (10342 x 10^5 N/m^2)

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Issued December 1973

National Bureau of Standards Technical Note 648

Nat. Bur. Stand. (U. S.), Tech. Note 648, 162 pages (December 1973)

CODEN: NBTNAE

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402
(Order by SD Catalog No. C13.46:648) $1.25

CONTENTS

LIST OF TABLES

LIST OF FIGURES

THERMOPHYSICAL PROPERTIES OF NITROGEN FROM THE FUSION LINE TO 3500 R (1944 K) FOR PRESSURES TO 150,000 PSIA (10342 x 10^5 N/m^2)*

R. T. Jacobsen, R. B. Stewart, R. D. McCarty, and H. J. M. Hanley

Tables of thermophysical properties of nitrogen are presented for temperatures from the fusion line to 3500 R for pressures to 3000 psia, and from the fusion line to 1500 R for pressures above 3000 psia to 150,000 psia. The tables include values of entropy, enthalpy, internal energy, density, specific volume, velocity of sound, specific heats (C_v and C_p), thermal conductivity, viscosity, thermal diffusivity, Prandtl number, and the dielectric constant for selected isobars. Additional tables are included for values of: $(\partial P/\partial V)_T$, $(\partial P/\partial T)_\rho$, $V(\partial H/\partial V)_p$, $(\partial P/\partial U)_v$, $V(\partial P/\partial V)_T$, and $(1/V)(\partial V/\partial T)_p$, which have special utility in heat transfer calculations. Tables of selected isobars for the liquid and vapor phases, and for the saturated vapor and saturated liquid are included.

An equation of state is presented for liquid and gaseous nitrogen for the temperature and pressure ranges of these tables. In the determination of the equation of state, all of the P-ρ-T (pressure-density-temperature) data available from the published literature were reviewed, and appropriate corrections made to bring experimental temperatures into accord with the International Practical Temperature Scale of 1968. The coefficients of the equation of state were determined by a weighted least squares fit to selected P-ρ-T data and simultaneously to C_v data determined by corresponding states analysis from oxygen data, and to data which defined the phase equilibrium criteria for the saturated liquid and saturated vapor. A vapor pressure equation, melting curve equation, and an equation to represent the ideal gas heat capacity of nitrogen are also presented. 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.

Key words: Density; dielectric constant; enthalpy; entropy; equation of state; fixed points; heat transfer coefficients; index of refraction; Joule-Thomson; latent heat; melting point; nitrogen; Prandtl number; specific heat; speed of sound; surface tension; thermal conductivity; thermal diffusivity; vapor pressure; viscosity; volume.

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* The development of the equation of state used in this work was carried out at the University of Idaho, Moscow, Idaho, and was supported by NASA-JSC Contract NAS 9-12078, and by OSRD-NBS Contract CST-962-5-69. The work carried out at the National Bureau of Standards was under NASA-JSC Contract T-1813A and (in part) was sponsored by the Office of Standard Reference Data.

1. INTRODUCTION

The work reported in this technical note was carried out in two parts in different locations. The equation of state work was carried out at the University of Idaho (section 2) while the transport and other properties (sections 3-9) work was carried out in the Cryogenic Data Center of the National Bureau of Standards in Boulder, Colorado. In this joint publication we have assembled under a single cover values for many of the properties of nitrogen which until now, if available at all, have been scattered through the world's literature. The tabular data presented here represent "best values" for each property at this time. Computer programs to calculate the properties presented in these tables are also available. Inquiries should be addressed to the National Bureau of Standards, Cryogenic Data Center, Boulder, Colorado 80302.

The tables of thermodynamic properties presented here are based on the thermodynamic property studies which have been carried out at the University of Idaho since 1969. This work was initially funded by the Office of Standard Reference Data of the National Bureau of Standards, and later by the Systems Management Branch, Johnson Space Center, of the National Aeronautics and Space Administration. The objectives of the project have been the development of an equation of state for the range of available experimental data for nitrogen, and the calculation of a table of thermodynamic properties of nitrogen which represents these data to within the estimated experimental uncertainty of the measurements. This represents an extension to higher temperature and pressures of the earlier thermodynamic property tables by Strobridge (1963). The study has included the critical evaluation of all of the experimental data for thermodynamic properties of nitrogen available from the published literature, and the formulation of an equation of state to represent the P-ρ-T data and other thermodynamic properties. In addition to the equation of state presented here for nitrogen, a parallel study has resulted in an equation of state for oxygen using the same functional form. A summary of this work is given by Jacobsen, et al. (1972). A more complete review of the development of the nitrogen thermodynamic property tables is given in Jacobsen (1972).

The work reported in sections 3 through 9 was sponsored by the NASA-Johnson Space Center, Cryogenics Section, and the inclusion of the transport properties was made possible by funding from the Office of Standard Reference Data of the National Bureau of Standards. In each section we have attempted to assign a realistic uncertainty to the property concerned. Where new work has been performed a brief summary of the work is given together with the necessary equations to enable the reader to reproduce the tabular values if desired.

2. THERMODYNAMIC AND RELATED PROPERTIES

2.1 Equation of State

The sources of experimental P-ρ-T data selected for use in this work are listed in table 1. All of the available data on thermodynamic properties of nitrogen have been critically evaluated, and the tables of properties presented in this work represent the selected data generally to within the estimated experimental uncertainty of the measurements.

To incorporate related thermodynamic data with the P-ρ-T data in the determination of the equation of state, procedures were developed for simultaneously including values of C_v and saturation data (to define the criteria for phase equilibrium between saturated liquid and saturated vapor) with the P-ρ-T data in a least squares fit of the equation of state. Details of the methods are presented by Hust and McCarty (1967) and are reviewed by Jacobsen (1972). The inclusion of saturation data in the least squares fit resulted in an equation of state which satisfies the Maxwell criterion. This equation of state may be used in the calculation of derived properties of liquid states by integration of the functions for properties along hypothetical isotherms through the two-phase region. The incorporation of C_v data resulted in an equation which exhibits the proper behavior of the first and second derivative functions, and the derived thermodynamic properties calculated from these derivatives.

Saturated liquid and saturated vapor densities used in the definition of phase equilibrium criteria in the determination of the equation of state were calculated from the simultaneous solution of the vapor pressure equation and interim equations of state. Separate equations of state were used in this calculation, the first an equation determined by a fit to the vapor data, and the second an equation determined by a fit to the liquid data.

Since few measurements of C_v have been published for nitrogen, it was necessary to use values of C_v in determining the equation of state which were estimated using the principle of corresponding states. The estimated C_v values were based on the equation for C_v for oxygen from Goodwin and Weber (1969), and were determined by the calculation procedure suggested by Diller (1971).

The coefficients given in table 2 for the equation of state (1) were determined by a weighted least squares fit which used simultaneously the P-ρ-T data, isochoric heat capacity data, and the saturation density data described above. This least squares fit was constrained to the critical point values given in table 3.

TABLE 1

SELECTED P-ρ-T DATA FOR NITROGEN

Source	Temperature Range (K)	Pressure Range (atm)	Number of Data Points
Canfield (1962)	133 - 273	2 - 300	152
Cockett, et al. (1968)	85 - 120	50 - 200	63
Crain (1965)	143 - 273	2 - 500	90
Friedman (1950)	80 - 300	1 - 200	201
Gibbons (1969)	72 - 77	22 - 124	17
Golubev and Dobrovolskii (1964)	78 - 133	49 - 484	59
Holborn and Otto (1924)	273 - 673	20 - 99	66
Michels, et al. (1934)	273 - 423	20 - 80	56
Michels, et al. (1936)	273 - 423	200 - 3000	147
Otto, et al. (1934)	298 - 423	45 - 400	63
Robertson and Babb (1969)	308 - 673	1600 - 10,000	170
Saurel (1958)	423 - 1073	10 - 900	87
Weber (1970)	80 - 140	30 - 266	76

$$
\begin{aligned}
p = \rho R T &+ \rho^2 (N_1 T + N_2 T^{1/2} + N_3 + N_4 / T + N_5 / T^2) \\
&+ \rho^3 (N_6 T + N_7 + N_8 / T + N_9 / T^2) \\
&+ \rho^4 (N_{10} T + N_{11} + N_{12} / T) + \rho^5 (N_{13}) \\
&+ \rho^6 (N_{14} / T + N_{15} / T^2) + \rho^7 (N_{16} / T) \\
&+ \rho^8 (N_{17} / T + N_{18} / T^2) + \rho^9 (N_{19} / T^2) \\
&+ \rho^3 (N_{20} / T^2 + N_{21} / T^3) \exp(-\gamma \rho^2) \\
&+ \rho^5 (N_{22} / T^2 + N_{23} / T^4) \exp(-\gamma \rho^2) \\
&+ \rho^7 (N_{24} / T^2 + N_{25} / T^3) \exp(-\gamma \rho^2) \\
&+ \rho^9 (N_{26} / T^2 + N_{27} / T^4) \exp(-\gamma \rho^2) \\
&+ \rho^{11} (N_{28} / T^2 + N_{29} / T^3) \exp(-\gamma \rho^2) \\
&+ \rho^{13} (N_{30} / T^2 + N_{31} / T^3 + N_{32} / T^4) \exp(-\gamma \rho^2)
\end{aligned} \tag{1}
$$

TABLE 2

COEFFICIENTS FOR THE EQUATION OF STATE (1) 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}	$0.585367172069521 \times 10^{-7}$

$\gamma = 0.0056$; $R = 0.0820539$ liter-atm/mole-K

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

TABLE 3

CONSTRAINTS IMPOSED ON THE EQUATION OF STATE

Pressure at the critical point	$p_c = 33.555$ atm
Density at the critical point	$\rho_c = 11.21$ mol/ℓ
Temperature at the critical point	$T_c = 126.20$ 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 equation of state is estimated to be accurate to within 0.5 percent in the liquid region for pressures to 500 atm, except in the vicinity of the critical point. The uncertainty of the equation for the liquid for pressures above 500 atm (and to the melting line) is ± 2 percent. For supercritical isotherms up to 15,000 psia the estimated accuracy of the equation of state is ± 0.1 percent, and ± 0.3 percent from 15,000 to 150,000 psia. Near the critical point (between 126.20 K and 150 K, and for pressures between 30 and 50 atm), the density deviations between the equation of state and measured data are as large as 2 percent. Comparisons between all thermodynamic property data from the literature and property values calculated with the equation of state are given in Jacobsen (1972). Table 4 is a summary of the root-mean-square deviations in pressure and density of values calculated using the equation of state from the various P-ρ-T data sets used in the development of the equation of state.

TABLE 4

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)
Canfield (1962)	0.14	0.22
Cockett, et al. (1968)	0.25	7.12
Crain (1965)	0.08	0.11
Friedman (1950)	0.24	0.14
Gibbons (1968)	0.16	7.90
Golubev and Dobrovolskii (1964)	0.35	5.52
Holborn and Otto (1924)	0.07	0.07
Michels, et al. (1934)	0.02	0.02
Michels, et al. (1936)	0.05	0.15
Otto, et al. (1934)	0.01	0.01
Robertson and Babb (1968)	0.08	0.22
Saurel (1958)	0.07	0.09
Weber (1970)	0.30	0.84

2.2 Vapor Pressure Equation

The vapor pressure equation used in this work was determined by a least squares fit to the nitrogen data of Armstrong (1954), and Weber (1970). These data were used since they include 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 given as equation (2). Table 5 is a list of the coefficients for this equation. The estimated accuracy of the vapor pressure equation is ± 0.01 K between the triple point and the critical point.

$$\ln(P) = N_1/T + N_2 + N_3 T + N_4 (T_c - T)^{1.95} + N_5 T^3 + N_6 T^4 + N_7 T^5 + N_8 T^6 + N_9 \ln(T) \quad (2)$$

where T_c = 126.20 K, the critical point temperature, T is the saturation temperature, and P is the vapor pressure.

TABLE 5

COEFFICIENTS FOR NITROGEN VAPOR PRESSURE EQUATION (2)*

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 Kelvin, and pressure in atmospheres.

2.3 Melting Curve Equation

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 (3) as reported by Grilly and Mills (1957) with appropriate temperature corrections.

$$P = a + bT^{c} \tag{3}$$

where $a = -1579.08$, $b = 0.926302$, and $c = 1.795$, with pressures in atmospheres and temperatures in K. Densities at the melting curve calculated from the equation of state agree with the measured values of Grilly and Mills (1957) generally to within ± 1.5 percent for the range from 63 to 120 K at pressures to 3500 atmospheres.

2.4 Ideal Gas Heat Capacity Equation

The values for the ideal gas heat capacity used in the calculation of the thermodynamic property tables presented here are given by equation (4) below with the coefficients listed in table 6. These coefficients were determined by a least squares fit to the data of Baehr, et al. (1968).

$$C_p^o/R = N_1/T^3 + N_2/T^2 + N_3/T + N_4 + N_5 T + N_6 T^2 + N_7 T^3 + N_8 u^2 e^u/(e^u - 1)^2 \tag{4}$$

TABLE 6

COEFFICIENTS FOR THE IDEAL GAS HEAT CAPACITY EQUATION (4) 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	$-0.1733901851 \times 10^{-4}$		$u = N_9/T$

*Coefficients are for temperature in Kelvin.

2.5 Calculation of 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 were calculated from the equation of state (1), and the ideal gas heat capacity equation (4). The vapor pressure equation (2) and the Simon melting curve equation (3) were used to identify the temperature of the phase changes from vapor to liquid, and solid to vapor, respectively, for each isobar. The functions for the various thermodynamic properties were continuously integrated through the two-phase region to calculate properties in the liquid range. The formulations for the calculation of the thermodynamic property tables were taken from Stewart (1966).

2.6 Heat Capacities

Values of C_p and C_v for nitrogen calculated by integration along isotherms using equation (1) with coefficients from table 1 are illustrated in figures 1 and 2 for isobars of 1, 10, 40, 100, 150, 200, and 400 atmospheres. Except for the critical region, the uncertainty in tabulated values of heat capacity is estimated to be $\pm$ 5 percent. At the critical point, the specific heats become very large, and no estimate of the accuracy of calculated values in this vicinity can be made.

2.7 Related Properties

The parameters defined below are often of use in engineering heat transfer calculations, and are tabulated here for the convenience of the user. These quantities have been calculated from the equation of state (1) with coefficients from table 1.

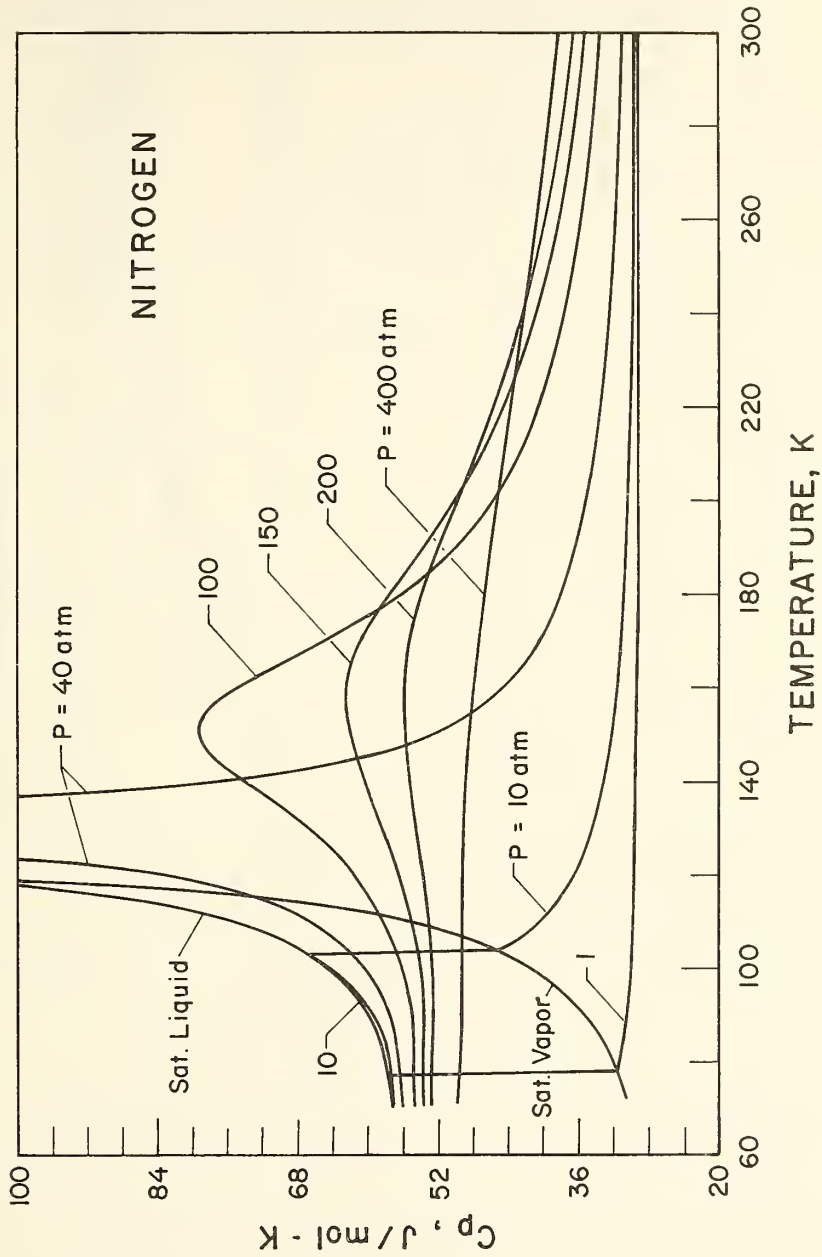

Figure 1. C_p for Nitrogen

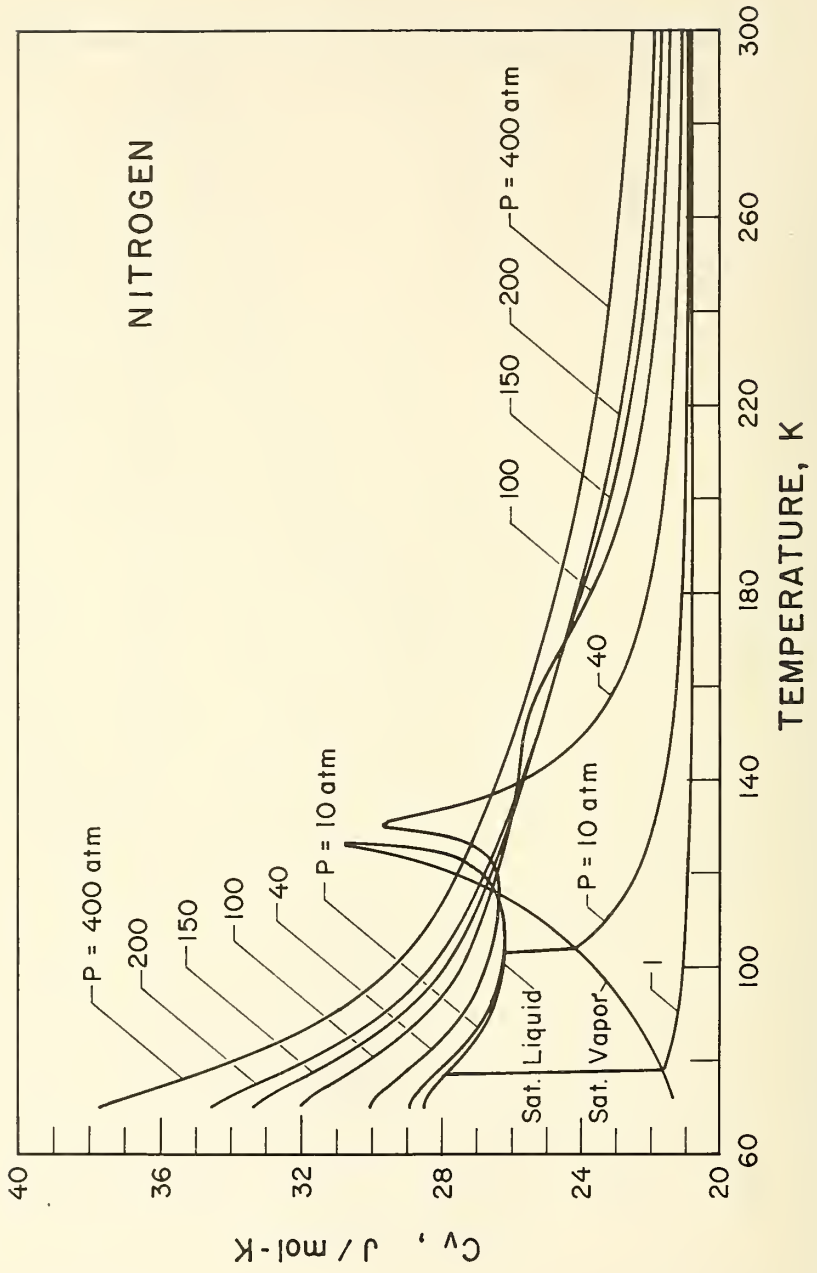

Figure 2. C_v for Nitrogen

Specific heat input

$$\theta = V\left(\frac{\partial H}{\partial V}\right)_p = \rho C_p \left[\left(\frac{\partial P}{\partial \rho}\right)_T / \left(\frac{\partial P}{\partial T}\right)_V \right] \tag{5}$$

Energy derivative

$$\Phi = V\left(\frac{\partial P}{\partial U}\right)_V = \frac{V}{C_v}\left(\frac{\partial P}{\partial T}\right)_V \tag{6}$$

Isothermal bulk modulus

$$\alpha = -V\left(\frac{\partial P}{\partial V}\right)_T = \rho\left(\frac{\partial P}{\partial \rho}\right)_T \tag{7}$$

Volume expansivity

$$\beta = \frac{1}{V}\left(\frac{\partial V}{\partial T}\right)_p = \frac{1}{\rho}\left(\frac{\partial P}{\partial T}\right)_\rho / \left(\frac{\partial P}{\partial \rho}\right)_T \tag{8}$$

3. TRANSPORT PROPERTIES

3.1 Thermal Conductivity

The thermal conductivity of a fluid may be separated into three additive parts:

$$\lambda = \lambda_o(T) + \Delta\lambda_E(\rho, T) + \Delta\lambda_c(\rho, T) \tag{9}$$

where $\lambda_o(T)$ is the dilute gas contribution, $\Delta\lambda_E(\rho, T)$ is the excess or dense fluid contribution, and $\Delta\lambda_c(\rho, T)$ is the enhancement due to the influence of the critical point. Hanley, McCarty and Sengers (1973) calculated the dilute gas contribution using a potential function. Their values are represented here by

$$\lambda_o(T) = \sum_{i=1}^{9} A_i T^{(i-3)} \tag{10}$$

where λ_o is in $10^3 \cdot$ W/cm-K, T is in K, and the A_i's were determined by a least squares fit to Hanley's calculated values.

TABLE 7

LEAST SQUARES ESTIMATES OF PARAMETERS

A_i IN EQUATION (10)

$$A_1 = -6.8939127475 \times 10$$
$$A_2 = 3.5226118983$$
$$A_3 = -6.8357539823 \times 10^{-2}$$
$$A_4 = 1.5832717315 \times 10^{-3}$$
$$A_5 = -2.6418423047 \times 10^{-6}$$
$$A_6 = 3.6093309138 \times 10^{-9}$$
$$A_7 = -2.5555598476 \times 10^{-12}$$
$$A_8 = 8.5635041641 \times 10^{-16}$$
$$A_9 = -1.0717599406 \times 10^{-19}$$

The maximum deviation between Hanley's λ_o values and values calculated from equation (10) over the temperature range of 70 to 1000 K is .1 percent; however the uncertainty of the dilute gas values is estimated to be ± 2 percent. Equation (10) should not be used for temperatures below 65 K or for temperatures above 1000 K.

The data of Ziebland (1955, 1958) were chosen as the basis for the excess function $\Delta\lambda_E(\rho, T)$. The temperature dependence of $\Delta\lambda_E(\rho, T)$ is small and has been neglected because the data are not of sufficient precision to warrant the fitting of a temperature dependence; therefore, $\Delta\lambda_E(\rho, T)$ was taken to be a function of ρ only and is represented by

$$\Delta\lambda_E(\rho, T) \approx \Delta\lambda_E(\rho) = 0.2195902219\rho + 0.06387370699(e^{3.6\rho} - 1.0) \qquad (11)$$

where λ_E is in $10^3 \cdot W/cm\text{-}K$, ρ is in g/cm^3. The adjustable parameters of equation (11) were determined by a combination of graphical and least squares analysis of the Ziebland data. No thermal conductivity data for densities greater than 0.88 g/cm^3 were used in determining the parameters for equation (11). Deviations between equation (11) and experimental data are within the accuracy of the experimental data.

An equation for the critical excess $\Delta\lambda_c(\rho, T)$ has recently been proposed by Sengers (1972) and modified by Hanley, McCarty and Sengers (1973). The equation is

$$\Delta\lambda_c(\rho, T) = \frac{kT^2}{A}\left(\frac{\partial P}{\partial T}\right)_\rho^2 (K_T)^{\frac{1}{2}} \qquad (12)$$

where K_T is the compressibility: $\rho K_T = (\partial\rho/\partial P)_T$ and k is Boltzmann's constant. The quantity A is given by

$$A = 6\pi\eta R\,(kT)^{\frac{1}{2}}\,\rho^{\frac{1}{2}}\,(N/M)^{\frac{1}{2}} \tag{13}$$

where η is the viscosity at the (ρ, T) point, N is Avagadroes number and M the molecular weight. R is a distance parameter which represents a range of intermolecular interaction. Using the same intermolecular potential employed to calculate the dilute gas values [fitted by equation (10)] we have shown [Hanley, McCarty and Sengers (1973)] that

$$R = r_m \left(\frac{n^*}{T^*}\right)^{\frac{1}{2}} \left\{\frac{2}{3}\,\pi \left[\frac{m-\gamma\,(m-8)}{m-6} + \frac{\gamma}{3}\right]\right\}^{\frac{1}{2}} \tag{14}$$

In this equation, m, γ and r_m are potential parameters given by $m = 12$, $\gamma = 2$ and r_m — a distance — is given by $r_m = 3.933 \times 10^{-10}$ m. n^* is a reduced density; $n^* = N\rho\, r_m^3/M$, and T^* a reduced temperature; $T^* = T\,(\varepsilon/k)$, where ε is the energy parameter of the potential which turns out to be $\varepsilon/k = 118$ K.

The necessary quantities for insertion into equation (12) are known, hence $\Delta\lambda_c$ can be determined as a function of density and temperature.

3.2 Viscosity

The viscosity of a fluid may be separated into two distinct parts which are additive

$$\eta = \eta_o(T) + \Delta\eta_E(\rho, T) \tag{15}$$

where $\eta_o(T)$ is the dilute gas contribution and $\eta_E(\rho, T)$ is the excess or dense fluid contribution. Unlike thermal conductivity, the viscosity exhibits very little, if any, enhancement in the critical region.

Using a potential function, Hanley, McCarty and Sengers (1973) calculated the dilute gas contribution $\eta_o(T)$. Since these calculations are slow in their original form they are represented here by

$$\eta_o(T) = \sum_{i=1}^{9} C_i\, T^{(i-3)} \tag{16}$$

where η_o is in units of 10^3 g/cm-s, T is in K, and the C_i's were determined by a least squares fit to Hanley's values.

TABLE 8

LEAST SQUARES ESTIMATES OF PARAMETERS

C_i IN EQUATION (16)

$$C_1 = 7.4165322904 \times 10^{1}$$
$$C_2 = -1.5834400475$$
$$C_3 = 3.8530771011 \times 10^{-3}$$
$$C_4 = 8.0133713668 \times 10^{-4}$$
$$C_5 = -8.9203123846 \times 10^{-7}$$
$$C_6 = 8.9059711315 \times 10^{-10}$$
$$C_7 = -5.3779372664 \times 10^{-13}$$
$$C_8 = 1.7398277309 \times 10^{-16}$$
$$C_9 = -2.3084044942 \times 10^{-20}$$

The maximum deviation between Hanley's η_o values and those calculated from equation over the temperature range of 70 to 1000 K is 0.15 percent; however, the uncertainty in the dilute gas values is estimated to be ± 2 percent. Equation (16) should not be used for temperatures below 65 K or for temperatures above 1000 K.

The temperature dependence of the $\Delta\eta_E(\rho, T)$ term is small and has been neglected here. As is the case for many other fluids, the excess function for viscosity exhibits a sharp transition in shape at a density of about two times critical. This behavior makes it difficult to represent the excess curve with a single mathematical function when the range of densities goes beyond about two times critical. For this reason, the excess curve for the viscosity is represented by two functions which are constrained to a common value of η at a density of 0.8 g/cm^3. The equations are based on the data of De Bock, et al. (1967). For densities less than 0.8 g/cm^3 equation (17) was used.

$$\Delta\eta_E(\rho, T) \approx \Delta\eta_E(\rho) = \sum_{i=1}^{7} D_i \rho^i \qquad (17)$$

where $\Delta\eta_E$ is in $10^3 \cdot$ g/cm-s, ρ is in g/cm^3 and the D_i's are given in table 9.

TABLE 9

LEAST SQUARES ESTIMATES OF PARAMETERS

D_i IN EQUATION (17)

$$D_1 = 2.3083514362 \times 10^{-1}$$
$$D_2 = -9.3636207171 \times 10^{-1}$$
$$D_3 = 9.0339186452$$
$$D_4 = -4.1832067163 \times 10$$
$$D_5 = 1.0897627893 \times 10^{2}$$
$$D_6 = -1.2913856376 \times 10^{2}$$
$$D_7 = 5.9782049913 \times 10$$

For densities greater than 0.8 g/cm^3 equation (18) was used.

$$\Delta\eta_E(\rho, T) = \Delta\eta_E(\rho) = \sum_{i=1}^{4} E_i \rho^{(i-1)} \qquad (18)$$

where $\Delta\eta_E$ is in $10^3 \cdot$ g/cm-s, ρ is in g/cm^3 and the E_i's are given in table 10.

TABLE 10

LEAST SQUARES ESTIMATES OF PARAMETERS

E_i IN EQUATION (18)

$$E_1 = -2.5781990818 \times 10^{3}$$
$$E_2 = 9.4784808659 \times 10^{3}$$
$$E_3 = -1.1622926973 \times 10^{4}$$
$$E_4 = 4.756948538 \times 10^{3}$$

No data for densities greater than 0.88 g/cm^3 were used in determining the parameters for equation (18). In the range of temperature and density of 65 to 1000 K and 0 to .88 g/cm^3 the uncertainty of the viscosities calculated using equations (16, 17 and 18) is estimated to be no greater than 10 percent.

4. SURFACE TENSION

The functional form

$$r = r_o (1 - T/T_c)^{\gamma} \tag{19}$$

proposed by Guggenheim (1945), represents the experimental surface tension data for nitrogen satisfactorily, where r is the surface tension of the saturated liquid in dyn/cm; T is the temperature in K; $r_o = 29.7074$; $\gamma = 1.27135$; and $T_c = 126.2$ K. The data of Baly and Donnan (1902), Reilly and Furukawa (1955) and Stansfield (1958) were used in the least squares estimates of the parameters in equation (19). The deviations between the experimental values and those calculated from equation (19) are shown in figure 4.

The uncertainty of the values of surface tension tabulated in Appendix D is estimated to be ± 2 percent except near the critical point where the surface tension becomes small.

5. DIELECTRIC CONSTANT

The dielectric constant of a fluid may be calculated from the Clausius-Mossotti equation:

$$\frac{\epsilon - 1}{\epsilon + 2} \frac{1}{\rho} = p \tag{20}$$

where ϵ is the dielectric constant, ρ is the density, and p is the specific polarization, a property of the substance having dimensions of specific volume. The existing experimental measurements of polarizability for nitrogen disagree by several percent, and a value of 2.5 for B_n was chosen on the basis of Oudemans (1967). The index of refraction data were used (see next section) to determine C_n.

$$p = A_n + B_n \rho + C_n \rho^2 \tag{21}$$

where p is the specific polarization in cm^3/mol and ρ is in the units of mol/cm^3. The parameters A_n, B_n and C_n are given in table 11.

6. INDEX OF REFRACTION

The Cauchy dispersion formula

$$r_{\Lambda}(\rho, \Lambda) = r_{\infty}(\rho) + \theta_1 / \Lambda^2 + \theta_2 / \Lambda^4 \tag{22}$$

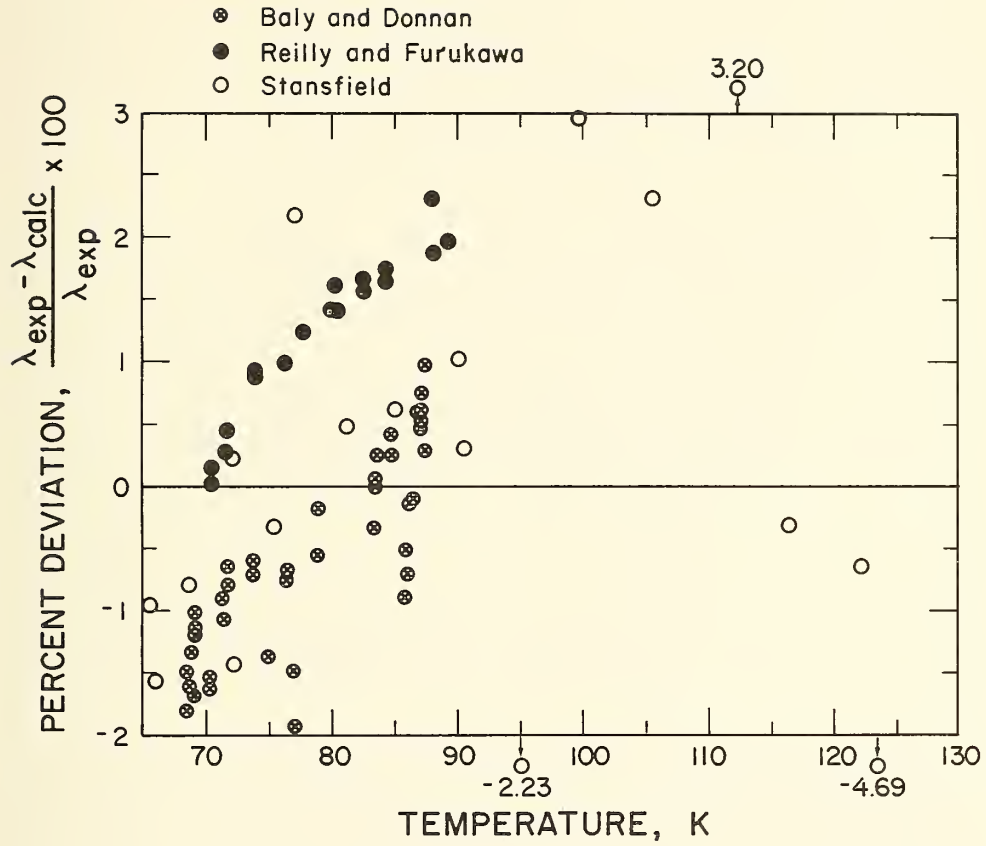

Figure 3. Deviations Between Calculated and Experimental Surface Tension Data

gives specific refraction, r_Λ, as a function of the density of the fluid and the wavelength of the incident radiation.

Maxwell's relation of

$$\epsilon = n_\infty^2 \tag{23}$$

is equivalent to

$$p = r_\infty \tag{24}$$

and therefore the Lorentz-Lorentz function may be written as

$$r_\Lambda = \frac{n^2 - 1}{n^2 + 2} \frac{1}{\rho} = A_n + B_n\rho + C_n\rho^2 + \theta_1/\Lambda^2 + \theta_2/\Lambda^4 \tag{25}$$

where n is the index of refraction, ρ is the density of the fluid, Λ is the wavelength of the incident radiation and A_n, B_n, C_n, θ_1 and θ_2 are adjustable parameters to be determined from the experimental data. The parameters A_n, B_n and C_n are usually determined from the dielectric constant data and the Clausius-Mossotti equation; however, as was mentioned in the previous section, the experimental dielectric constant data for nitrogen found in the literature disagrees so badly, it was decided to try to establish the specific polarizability function from the experimental index of refraction data. Two primary sources of index of refraction data were found, Johns and Wilhelm (1937) and Michels, et al., (1947). The Johns and Wilhelm data are for the saturated liquid for various wavelengths at temperatures in the vicinity of the normal boiling point, and the Michels, et al. data are for the 298.15 K isotherm for various wavelengths to pressures of 2050 atmospheres which gives a density slightly less than those of the saturated liquid data.

To determine the θ_1 and θ_2 in equation (25), the index of refraction data for N_2 given in Landolt-Bornstein were used. These data are for various wavelengths and the state condition of 1 atmosphere and 298.15 K. A specific polarizability from Oudemans (1967) was assumed for this state point and a least squares fit performed on equation (25). Next, using these values of θ_1 and θ_2 the data of Johns and Wilhelm (1937) and Michels, et al., (1947) were used in a second least squares fit of equation (25) to determine A_n, B_n and C_n. The above treatment of the Johns and Wilhelm and Michels, et al., data showed the two sources of data to be in excellent agreement and in no case did the deviation between a calculated n and an experimental n exceed 0.06 percent with the average being about 0.01 percent.

The parameters for equation (25) are given in table 11.

TABLE 11

LEAST SQUARES ESTIMATES OF PARAMETERS

FOR EQUATION (21 and 25)

A_n = 4.389 cc/mol

B_n = 1.1 equation (25)

B_n = 2.2 equation (21)

C_n = -114.0

θ_1 = 2.5117362853×10^8 angstroms^2

θ_2 = $1.1245665799 \times 10^{12}$

Table 12 gives the index of refraction for saturated liquid N_2 calculated using equation (25). Figure 4 shows the index of refraction for nitrogen as a function of wavelength and density.

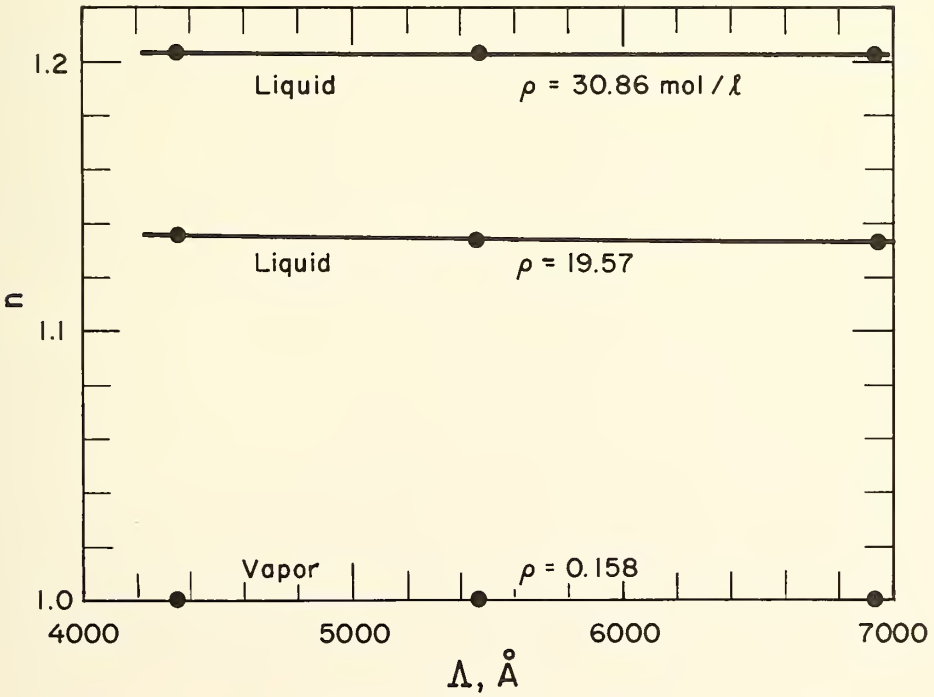

Figure 4. Index of Refraction as a Function of Wavelength and Density

TABLE 12

INDEX OF REFRACTION OF SATURATED LIQUID NITROGEN AT THREE WAVELENGTHS

Temp K	4358 Å n	5462 Å n	6939 Å n
64.0	1.2156	1.2130	1.2113
68.0	1.2116	1.2091	1.2075
72.0	1.2074	1.2050	1.2034
76.0	1.2030	1.2006	1.1990
80.0	1.1983	1.1960	1.1944
84.0	1.1934	1.1911	1.1896
88.0	1.1883	1.1861	1.1846
92.0	1.1829	1.1807	1.1793
96.0	1.1772	1.1751	1.1738
100.0	1.1711	1.1691	1.1678
104.0	1.1646	1.1627	1.1615
108.0	1.1576	1.1558	1.1546
112.0	1.1498	1.1481	1.1469
116.0	1.1409	1.1393	1.1382
120.0	1.1299	1.1284	1.1275
124.0	1.1133	1.1121	1.1112
126.0	1.0915	1.0905	1.0898

7. THERMAL DIFFUSIVITY

The thermal diffusivity of a fluid is defined as

$$\sigma = \lambda/(\rho C_p) \qquad (26)$$

where σ is the thermal diffusivity, λ is the thermal conductivity, and C_p is the specific heat at constant pressure. The tabulations of thermal diffusivity in Appendices D and E have been calculated using the above equation, and ρ, λ, and C_p in the tables. The uncertainity of σ is estimated to range from ± 2 percent in the low density gas to as much as ± 10 percent in the high density liquid, except in the critical region where it is greater.

8. PRANDTL NUMBER

The Prandtl number is frequently used in engineering calculations and is defined as:

$$Pr = C_p \eta / \lambda \tag{27}$$

where Pr is the Prandtl number, C_p is the specific heat at constant pressure, η is the viscosity, and λ is the thermal conductivity. The tabulations of the Prandtl number in Appendices D and E have been calculated from equation (27) using η, λ, and C_p from the tables. Since Pr is a function of three of the most uncertain properties in the tabulations the uncertainty of Pr is estimated to range from ± 2 percent for the low density gas to as much as ± 20 percent in the dense liquid state, except in the critical region where the uncertainty is undoubtedly greater.

9. JOULE-THOMSON INVERSION CURVE

The Joule-Thomson coefficient for a fluid is defined as:

$$J = (\partial T / \partial P)_H \quad . \tag{28}$$

The locus of points where $J = 0$ is called the Joule-Thomson inversion curve: see table 13. The inversion curve has been calculated from

$$T(\partial P / \partial T)_\rho = \rho (\partial P / \partial \rho)_T \tag{29}$$

and the equation of state in section 2.1. Figure 5 gives the Joule-Thomson inversion curve as a function of pressure and temperature.

TABLE 13

JOULE-THOMSON INVERSION CURVE

Temperature		Pressure		Density	
K	R	atm	psia	mol/ℓ	lb/ft^3
100	180	.74	10.87	24.41	42.70
110	198	59.88	880.0	23.62	41.32
120	2156	111.1	1633.0	22.89	40.04
130	234	155.8	2290.0	22.19	38.82
140	252	194.8	2863.0	21.52	37.64
150	270	228.7	3361.0	20.86	36.49
160	288	258.1	3792.0	20.23	35.38
180	324	305.0	4483.0	19.01	33.24
200	360	339.0	4982.0	17.84	31.20
240	432	377.6	5549.0	15.64	27.36
260	468	385.7	5669.0	14.61	25.55
270	486	387.6	5696.0	14.11	24.68
280	504	388.1	5703.0	13.61	23.81
290	522	387.4	5693.0	13.13	22.96
300	540	385.5	5665.0	12.65	22.13
350	630	361.1	5306.	10.36	18.12
400	720	315.0	4644.0	8.186	14.32
500	900	181.8	2671.0	4.067	7.115
600	1080	2.91	35.48	0.04898	0.08568

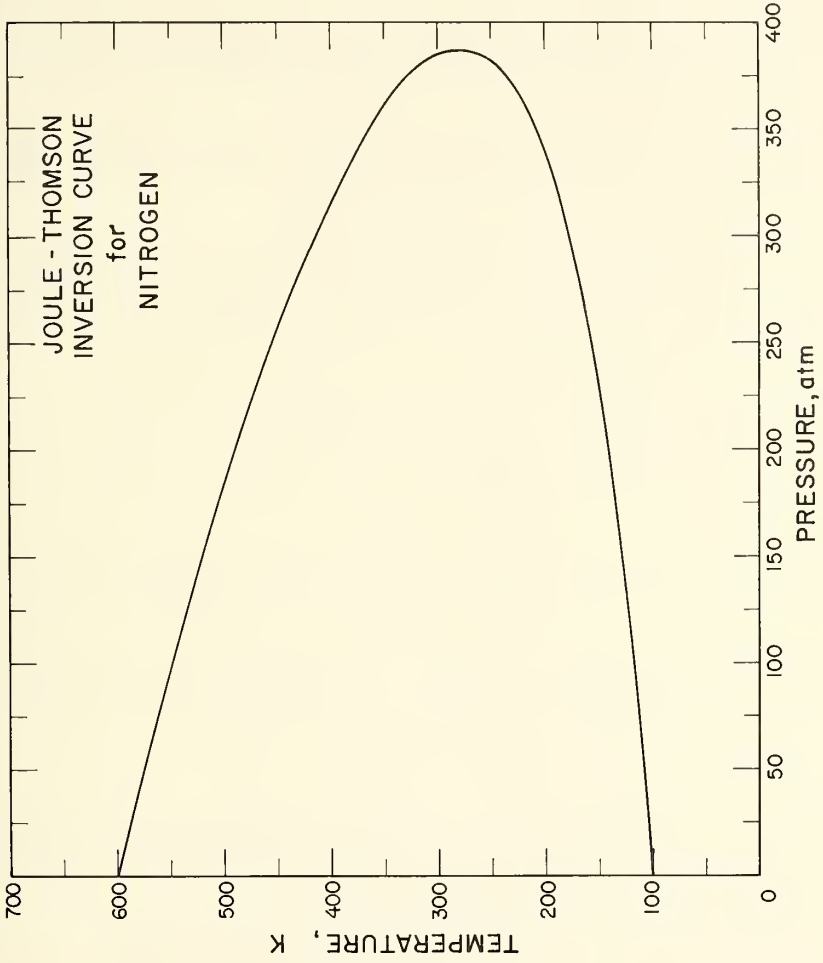

Figure 5. Joule-Thomson Inversion Curve

10. BIBLIOGRAPHY

Armstrong, G. T., Vapor Pressure of Nitrogen, J. Res. Nat. Bur. Stand. (U.S.), 53, 263-266 (1954).

Baehr, H. D., Hartmann, H., Pohl, H. C., and Schomäcker, Thermodynamische Funktionen Idealer Gase für Temperaturen bis 6000 K, Springer-Verlag, Berlin/Heidelberg (1968).

Baly, E. C. C., and Donnan, F. G., The Variation with Temperature of the Surface Energies and Densities of Liquid Oxygen, Nitrogen, Argon and Carbon Monoxide, J. Chem. Soc. (London) 81, No. 93, 907-23 (1902).

Canfield, F. B., Jr., The Compressibility Factors and Second Virial Coefficients for Helium-Nitrogen Mixtures at Low Temperature and High Pressure, Rice University, Houston, Texas, Ph.D. Thesis (1962).

Cockett, A. H., Goldman, K., and Scrase, N. G., The Density of Liquid-Nitrogen from 85 to 120 Degrees K and from the Saturation Boundary to 200 Atmospheres, Proceedings of the Second International Cryogenic Engineering Conference, Iliffe Science and Technology Publications, Ltd., Guildford, England, 276-280 (1968).

Crain, R. W., Jr., P-V-T Behavior in the Argon-Nitrogen System, Ph.D. Thesis, University of Michigan, Ann Arbor, Michigan (1965).

De Bock, A., Grevendonk, W., and Herreman, W., Shear Viscosity of Liquid Argon, Physica 37, 227-232 (1967).

Diller, D. E., The Specific Heats (C_V) of Dense Simple Fluids, Cryogenics 11, 186-191 (1971).

Friedman, A. S., Pressure-Volume-Temperature Relationships of Gaseous Hydrogen, Nitrogen, and a Hydrogen-Nitrogen Mixture, Ph.D. Thesis, The Ohio State University, Columbus, Ohio (1950).

Gibbons, R. M., The Equation of State of Neon Between 27 and 70 K, Cryogenics 9, 251-260 (1969).

Golubev, I. F., and Dobrovolskii, O. A., Measurement of the Density of Nitrogen and Hydrogen at Low Temperatures and High Pressures by the Method of Hydrostatic Weighing, Gasovaia Promyshlen 9, 43-47 (1964).

Goodwin, R. D., and Weber, L. A., Specific Heats of Oxygen at Coexistence, J. Res. Nat. Bur. Stand. (U.S.), 73A (Phys. and Chem.), 1-13 (1969).

Grilly, E. R., and Mills, R. L., Volume Change on Melting of N_2 up to 3500 kg/cm^2, Physical Review 105, 1140-1145 (1957).

Guggenheim, E. A., The Principle of Corresponding States, J. Chem. Phys. 13, 253-61 (1945).

Hanley, H. J. M., McCarty, R. D., and Sengers, J. V., The Determination of the Critical Point Anomaly in the Thermal Conductivity Coefficient (1973). In preparation.

Holborn, L., and Otto, J., Uber die Isothermen einiger Gase bis 400° und ihre Bedentung für das Gasthermometer, Z. Physik 23, 77-94 (1924).

Hust, J. G., and McCarty, R. D., Curve-Fitting Techniques and Applications to Thermodynamics, Cryogenics 7, 200-206 (1967).

Jacobsen, R. T., 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).

Jacobsen, R. T., Stewart, R. B., and Myers, A. F., An Equation of State for Oxygen and Nitrogen, Advances in Cryogenic Engineering (Proc. 1972 Cryogenic Engineering Conf.) Vol. 18, 248 (Plenum Press, New York, 1973).

Johns, H. E., and Wilhelm, J. O., The Refractive Indices of Liquid Oxygen, Nitrogen, and Hydrogen, Can. J. Res. 15A, No. 7, 101-08 (July 1937).

Mechtly, E. A., The International System of Units, Physical Constants and Conversion Factors, NASA SP-7012 (1964).

Michels, A., Wouters, H., and DeBoer, J., Isotherms of Nitrogen Between 0 Degrees and 150 Degrees and at Pressures from 20 to 80 Atmospheres, Physica 1, 587-594 (1934).

Michels, A., Wouters, H., and DeBoer, J., Isotherms of Nitrogen Between 200 and 3000 Atmospheres and 0 Degrees and 150 Degrees, Physica 3, 585-589 (1936).

Michels, A., Lebesque, H., Lebesque, L., and DeGrout, S. R., Refractive Index and Lorentz-Lorentz Function of Nitrogen up to 2000 Atmospheres at 25°C, Physica 13, No. 6-7, 337-42 (Aug. 1947).

Otto, J., Michels, A., and Wouters, H., Über Isothermen des Stickstoffes zwischen 0° und 150° bei Drucken bis zu 400 Atmosphären, Physik Z. 35, 97-101 (1934).

Oudemans, G. J., The Dielectric Constant of Helium, Argon, Nitrogen and Carbon Dioxide up to 80 Amagats. Doctoral Thesis, University of Amsterdam (1967).

Reilly, M. L., and Furukawa, G. T., Surface Tension of Oxygen, Nitrogen and their Mixtures, Unpublished Nat. Bur. Stand. Report (1955).

Robertson, S. L., and Babb, S. E., Jr., Isotherms of Nitrogen to 400 Degrees C and 1000 Bar, J. Chem. Phys. 50, 4560-4564 (1969).

Saurel, J. R., Determination of the Equations of State of Compressed Gases at Elevated Temperatures, Application to the study of nitrogen to 1000 kg/cm^2 and 1000 degrees, J. Recherches Centre Natl. Recherches Sci. 42, 21-60 (1958).

Sengers, J. V., Transport Properties of Gases and Binary Liquids Near the Critical Point. NASA Contractor Report-2112, (Sept. 1972).

Stansfield, D., The Surface Tension of Liquid Argon and Nitrogen, Proc. Phys. Soc. (London) 72, 854-66 (1958).

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

Strobridge, T. R., The Thermodynamic Properties of Nitrogen from 114 to 540 R Between 1.0 and 3000 Psia, Nat. Bur. Stand. (U.S.), Tech. Note No. 129A (1963).

Weber, L. A., Some Vapor Pressure and P-V-T Data on Nitrogen in the Ranges 65 to 140 K, J. Chem. Thermodyn. 2, 839-846 (1970).

Ziebland, H., and Burton, J. T. A., The Thermal Conductivity of Liquid and Gaseous Oxygen, Brit. J. Appl. Phys. 6, 416-20 (1955).

Ziebland, H., and Burton, J. T. A., The Thermal Conductivity of Nitrogen and Argon in the Liquid and Gaseous States, Brit. J. Appl. Phys. 9, 52-59 (1958).

APPENDIX A. LIST OF SYMBOLS AND UNITS

The calculation of the tables and properties presented here was performed in many different systems of units, and converted to engineering units at the very end of the calculations; therefore the reader is cautioned to pay particular attention to the units when consulting individual sections of this document. All conversion factors have been taken from the National Aeronautics and Space Administration Report Number SP-7012 (Mechtly 1964).

R = gas constant, 0.3830703 ft^3 - psia/lb_m-R

P = pressure, psia

V = molar volume, ft^3/lb_m

T = absolute temperature, degrees Rankine

ρ = density, lb_m/ft^3

C_p = specific heat at constant pressure, BTU/lb_m-R

C_v = specific heat at constant volume, BTU/lb_m-R

C_{sat} = specific heat of the saturated liquid BTU/lb_m-R

S = entropy, BTU/lb_m-R

H = enthalpy, BTU/lb_m

U = internal energy BTU/lb_m

W = speed of sound, ft/s

$(\partial P/\partial T)_\rho$ = isochore derivative, psia/R

$(\partial P/\partial V)_T$ = isotherm derivative, ft^3-psia/lb_m

$V(\partial H/\partial V)_P$ = specific heat input, BTU/lb_m

$V(\partial P/\partial U)_V$ = energy derivative, psia ft^3/BTU

$V(\partial P/\partial V)_T$ = isothermal bulk modulus, psia

$1/V(\partial V/\partial T)_P$ = volume expansivity, 1/R

n = index of refraction, dimensionless

r = specific refraction, ft^3/lb_m

Pr = Prandtl number, dimensionless

p = specific polarizability, ft^3/lb_m

J = Joule-Thomson coefficient

λ = thermal conductivity, BTU/ft-h-R

η = viscosity, lb_m/ft-s

ε = dielectric constant, dimensionless

γ = surface tension, lb_f/in

Λ = wave length, angstrom

σ = thermal diffusivity, ft^2/hr

APPENDIX B. FIXED POINTS

Critical Point

P_c = 493.0 psia (33.55 atm)

ρ_c = 19.60 lb_m/ft^3 (0.01121 g mol/cm^3)

T_c = 227.16 R (126.20 K)

Normal Boiling Point

P = 14.696 psia (1 atm)

T = 139.225 R (77.347 K)

ρ_{gas} = 0.2880 lb_m/ft^3 (0.0001647 g mol/cm^3)

ρ_{liquid} = 50.49 lb_m/ft^3 (0.02887 g mol/cm^3)

Triple Point

T = 113.666 R (63.148 K)

P = 1.818 psia (0.1237 atm)

ρ_{gas} = 4.21×10^{-2} lb_m/ft^3 (2.41×10^{-5} g mol/cm^3)

ρ_{liquid} = 54.18 lb_m/ft^3 (0.03098 g mol/cm^3)

APPENDIX C. CONVERSION FACTORS

Temperature	1.8 R = 1 K
Pressure	14.695949 psia = 1 atm = 1.01325×10^5 N/m^2
Specific Volume	0.0005718142 ft^3/lb_m = 1 cm^3/g mol
Internal Energy, Enthalpy	0.0153573 BTU/lb_m = 1 J/g mol
Entropy, Specific Heat	0.0085318 BTU/lb_m R = 1 J/g mol-K
Thermal Conductivity	0.0578176 BTU/ft-hr-R = 1 mW/cm-K
Viscosity	0.067196897 lb_m/ft-s = 1 g/cm-s
Speed of Sound	3.2808 ft/s = 1 m/s
Molecular Weight	28.0134*
Surface Tension	0.5710147×10^{-5} lb_f/in = 1 dyn/cm

* On the C^{12} = 12.000 scale.

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID NITROGEN

TEMP DEG. R	PRESS PSIA	VOLUME CU FT/LB	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/R	INTERNAL ENERGY BTU/LB B	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB -R	CP	VELOCITY OF SOUND FT/SEC	SURFACE TENSION LB/IN X 10 5
* 113.700	1.818	0.01846	1990.0	258.0	-64.68	-64.67	0.5802	0.228	0.467	4351.0	7.021
* 113.700	1.818	23.73	42.7	0.0163	19.91	27.90	1.395	0.173	0.253	528.6	
114.0	1.880	0.01847	1970.0	256.0	-64.52	-64.52	0.5816	0.229	0.468	4322.0	6.994
114.0	1.880	23.00	42.6	0.0168	19.96	27.97	1.394	0.179	0.253	529.3	
116.0	2.294	0.01856	1850.0	245.0	-63.58	-63.58	0.5898	0.234	0.474	4163.0	6.838
116.0	2.294	19.16	43.4	0.0202	20.29	28.43	1.384	0.173	0.254	533.4	
118.0	2.778	0.01866	1740.0	234.0	-62.63	-62.62	0.5979	0.238	0.478	4023.0	6.682
118.0	2.778	16.06	44.0	0.0242	20.61	28.88	1.374	0.180	0.254	537.5	
120.0	3.341	0.01875	1640.0	225.0	-61.67	-61.66	0.6060	0.241	0.482	3897.0	6.526
120.0	3.341	13.56	44.6	0.0287	20.93	29.32	1.365	0.180	0.255	541.4	
122.0	3.992	0.01885	1550.0	216.0	-60.71	-60.69	0.6139	0.242	0.484	3784.0	6.372
122.0	3.992	11.51	45.2	0.0338	21.25	29.76	1.356	0.180	0.256	545.2	
124.0	4.740	0.01895	1460.0	208.0	-59.74	-59.72	0.6218	0.243	0.486	3680.0	6.218
124.0	4.740	9.829	45.7	0.0397	21.56	30.19	1.348	0.181	0.257	549.0	
126.0	5.595	0.01905	1380.0	200.0	-58.76	-58.74	0.6296	0.243	0.488	3584.0	6.065
126.0	5.595	8.441	46.2	0.0464	21.87	30.61	1.340	0.181	0.258	552.6	
128.0	6.567	0.01916	1310.0	193.0	-57.79	-57.77	0.6373	0.243	0.489	3495.0	5.913
128.0	6.567	7.287	46.7	0.0538	22.17	31.03	1.332	0.181	0.260	556.1	
130.0	7.665	0.01927	1240.0	186.0	-56.81	-56.78	0.6449	0.242	0.490	3412.0	5.762
130.0	7.665	6.321	47.1	0.0622	22.47	31.44	1.324	0.182	0.261	559.5	
132.0	8.902	0.01938	1180.0	179.0	-55.83	-55.80	0.6523	0.241	0.491	3334.0	5.612
132.0	8.902	5.509	47.5	0.0716	22.76	31.84	1.317	0.182	0.262	562.8	
134.0	10.29	0.01949	1120.0	173.0	-54.85	-54.81	0.6597	0.240	0.491	3260.0	5.462
134.0	10.29	4.823	47.9	0.0820	23.05	32.23	1.310	0.183	0.264	565.9	
136.0	11.83	0.01961	1070.0	167.0	-53.87	-53.83	0.6670	0.239	0.492	3189.0	5.314
136.0	11.83	4.240	48.2	0.0936	23.33	32.62	1.303	0.183	0.265	569.0	
138.0	13.55	0.01973	1020.0	161.0	-52.89	-52.84	0.6742	0.238	0.493	3121.0	5.166
138.0	13.55	3.742	48.6	0.106	23.60	32.99	1.297	0.184	0.267	571.9	
139.2	14.70	0.01981	987.0	158.0	-52.29	-52.23	0.6785	0.237	0.493	3081.0	5.076
139.2	14.70	3.473	48.7	0.115	23.77	33.22	1.293	0.184	0.268	573.6	
140.0	15.46	0.01986	968.0	156.0	-51.91	-51.85	0.6812	0.237	0.493	3057.0	5.019
140.0	15.46	3.315	48.8	0.121	23.87	33.36	1.290	0.184	0.269	574.7	
142.0	17.56	0.01999	923.0	151.0	-50.92	-50.86	0.6882	0.236	0.494	2994.0	4.873
142.0	17.56	2.947	49.1	0.136	24.13	33.71	1.284	0.185	0.271	577.3	
144.0	19.87	0.02012	880.0	146.0	-49.94	-49.86	0.6951	0.235	0.495	2933.0	4.728
144.0	19.87	2.628	49.3	0.153	24.39	34.06	1.278	0.186	0.273	579.9	
146.0	22.40	0.02025	840.0	141.0	-48.95	-48.87	0.7019	0.233	0.496	2875.0	4.584
146.0	22.40	2.352	49.4	0.172	24.63	34.39	1.273	0.186	0.276	582.3	
148.0	25.17	0.02039	801.0	136.0	-47.97	-47.87	0.7086	0.232	0.497	2817.0	4.441
148.0	25.17	2.111	49.6	0.192	24.87	34.71	1.267	0.187	0.278	584.5	
150.0	28.19	0.02053	764.0	132.0	-46.98	-46.87	0.7153	0.231	0.498	2761.0	4.299
150.0	28.19	1.899	49.6	0.215	25.11	35.02	1.262	0.187	0.281	586.7	
152.0	31.48	0.02068	729.0	128.0	-45.99	-45.87	0.7218	0.230	0.500	2706.0	4.157
152.0	31.48	1.714	49.7	0.239	25.33	35.32	1.256	0.188	0.283	588.7	
154.0	35.04	0.02083	695.0	124.0	-44.99	-44.86	0.7283	0.230	0.502	2653.0	4.017
154.0	35.04	1.550	49.7	0.266	25.55	35.60	1.251	0.189	0.286	590.5	
156.0	38.89	0.02098	663.0	120.0	-44.00	-43.85	0.7347	0.229	0.504	2600.0	3.878
156.0	38.89	1.406	49.6	0.295	25.75	35.88	1.246	0.190	0.290	592.3	
158.0	43.04	0.02114	632.0	116.0	-43.00	-42.83	0.7411	0.228	0.506	2548.0	3.740
158.0	43.04	1.278	49.5	0.326	25.95	36.13	1.241	0.190	0.293	593.9	
160.0	47.52	0.02130	602.0	112.0	-42.00	-41.81	0.7474	0.227	0.508	2497.0	3.603
160.0	47.52	1.164	49.3	0.360	26.14	36.38	1.236	0.191	0.297	595.3	
162.0	52.33	0.02147	573.0	109.0	-40.99	-40.78	0.7537	0.227	0.511	2446.0	3.467
162.0	52.33	1.062	49.1	0.397	26.31	36.60	1.232	0.192	0.300	596.6	
164.0	57.48	0.02165	545.0	105.0	-39.98	-39.75	0.7599	0.226	0.514	2396.0	3.333
164.0	57.48	0.9709	48.9	0.437	26.48	36.81	1.227	0.193	0.305	597.8	
166.0	63.00	0.02182	518.0	102.0	-38.97	-38.71	0.7660	0.226	0.518	2347.0	3.199
166.0	63.00	0.8893	48.5	0.480	26.63	37.01	1.223	0.194	0.309	598.8	
168.0	68.90	0.02201	492.0	98.4	-37.95	-37.67	0.7722	0.225	0.521	2298.0	3.067
168.0	68.90	0.8160	48.2	0.526	26.78	37.19	1.218	0.195	0.314	599.7	

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID NITROGEN

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DV)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$-(DV/DT)_P/V$ DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFUSIFITYTY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
* 113.700	54.17	196.0	20.9	108000.0	0.00239	0.0948	20.7	0.00375	1.46694	3.66
* 113.700	0.04215	27.9	2.16	1.80	0.00905	0.00351	0.301	0.330	1.00032	0.780
114.0	54.13	195.0	20.6	107000.0	0.00240	0.0946	20.4	0.00374	1.46653	3.63
114.0	0.04347	28.0	2.16	1.86	0.00903	0.00352	0.302	0.320	1.00033	0.780
116.0	53.87	193.0	19.4	100000.0	0.00245	0.0933	19.1	0.00366	1.46401	3.48
116.0	0.05220	28.4	2.16	2.27	0.00892	0.00359	0.306	0.271	1.00039	0.778
118.0	53.60	190.0	18.4	93300.0	0.00251	0.0921	17.8	0.00359	1.46145	3.33
118.0	0.06226	28.9	2.16	2.74	0.00881	0.00365	0.310	0.231	1.00047	0.777
120.0	53.33	187.0	17.5	87400.0	0.00257	0.0908	16.7	0.00354	1.45885	3.20
120.0	0.07377	29.3	2.16	3.29	0.00872	0.00372	0.314	0.197	1.00056	0.777
122.0	53.05	184.0	16.8	82000.0	0.00263	0.0896	15.8	0.00349	1.45620	3.07
122.0	0.08689	29.7	2.16	3.92	0.00863	0.00379	0.319	0.170	1.00065	0.777
124.0	52.77	181.0	16.2	77100.0	0.00269	0.0883	14.9	0.00344	1.45351	2.96
124.0	0.1017	30.1	2.16	4.65	0.00854	0.00385	0.323	0.147	1.00077	0.777
126.0	52.49	177.0	15.7	72500.0	0.00275	0.0870	14.2	0.00340	1.45077	2.87
126.0	0.1185	30.5	2.16	5.47	0.00847	0.00392	0.328	0.128	1.00089	0.778
128.0	52.20	174.0	15.2	68400.0	0.00282	0.0858	13.6	0.00336	1.44799	2.79
128.0	0.1372	30.9	2.16	6.40	0.00841	0.00399	0.333	0.112	1.00103	0.780
130.0	51.90	170.0	14.8	64500.0	0.00288	0.0845	13.0	0.00332	1.44517	2.72
130.0	0.1582	31.3	2.16	7.45	0.00835	0.00406	0.338	0.0983	1.00119	0.782
132.0	51.60	167.0	14.4	60900.0	0.00294	0.0832	12.5	0.00329	1.44230	2.66
132.0	0.1815	31.6	2.16	8.62	0.00830	0.00413	0.343	0.0867	1.00137	0.784
134.0	51.30	164.0	14.0	57500.0	0.00300	0.0820	12.1	0.00325	1.43940	2.61
134.0	0.2073	32.0	2.16	9.93	0.00826	0.00420	0.348	0.0768	1.00156	0.787
136.0	50.99	160.0	13.7	54400.0	0.00307	0.0807	11.7	0.00322	1.43646	2.57
136.0	0.2359	32.3	2.16	11.4	0.00822	0.00427	0.353	0.0683	1.00178	0.790
138.0	50.67	157.0	13.4	51500.0	0.00313	0.0795	11.3	0.00318	1.43348	2.52
138.0	0.2672	32.6	2.17	13.0	0.00820	0.00435	0.359	0.0609	1.00201	0.794
139.2	50.48	156.0	13.2	49800.0	0.00317	0.0787	11.0	0.00316	1.43164	2.49
139.2	0.2879	32.8	2.17	14.0	0.00818	0.00439	0.362	0.0569	1.00217	0.796
140.0	50.36	154.0	13.1	48800.0	0.00320	0.0782	10.9	0.00315	1.43046	2.47
140.0	0.3017	32.9	2.17	14.7	0.00818	0.00442	0.364	0.0545	1.00227	0.797
142.0	50.03	151.0	12.8	46200.0	0.00326	0.0770	10.4	0.00311	1.42741	2.40
142.0	0.3393	33.2	2.17	16.7	0.00817	0.00450	0.370	0.0489	1.00256	0.802
144.0	49.71	149.0	12.5	43800.0	0.00333	0.0757	10.0	0.00308	1.42432	2.36
144.0	0.3805	33.5	2.17	18.8	0.00817	0.00458	0.375	0.0440	1.00287	0.807
146.0	49.38	146.0	12.2	41500.0	0.00340	0.0745	9.70	0.00304	1.42119	2.32
146.0	0.4252	33.7	2.17	21.0	0.00817	0.00466	0.381	0.0397	1.00321	0.812
148.0	49.04	143.0	12.0	39300.0	0.00347	0.0733	9.39	0.00301	1.41802	2.29
148.0	0.4738	33.9	2.17	23.5	0.00819	0.00474	0.387	0.0360	1.00357	0.817
150.0	48.70	141.0	11.7	37200.0	0.00355	0.0721	9.10	0.00297	1.41482	2.26
150.0	0.5265	34.1	2.18	26.1	0.00822	0.00482	0.393	0.0326	1.00397	0.823
152.0	48.36	138.0	11.5	35200.0	0.00362	0.0709	8.81	0.00293	1.41158	2.24
152.0	0.5835	34.3	2.18	29.0	0.00825	0.00491	0.399	0.0297	1.00440	0.830
154.0	48.01	135.0	11.2	33400.0	0.00371	0.0696	8.53	0.00289	1.40830	2.21
154.0	0.6450	34.5	2.18	32.0	0.00829	0.00499	0.405	0.0270	1.00487	0.837
156.0	47.66	133.0	11.0	31600.0	0.00379	0.0685	8.26	0.00285	1.40498	2.19
156.0	0.7113	34.7	2.18	35.3	0.00835	0.00508	0.412	0.0247	1.00537	0.845
158.0	47.30	130.0	10.7	29900.0	0.00388	0.0673	7.99	0.00281	1.40162	2.16
158.0	0.7827	34.8	2.19	38.7	0.00841	0.00517	0.418	0.0226	1.00591	0.853
60.0	46.94	128.0	10.5	28200.0	0.00397	0.0661	7.73	0.00277	1.39822	2.14
160.0	0.8594	34.9	2.19	42.4	0.00849	0.00527	0.425	0.0207	1.00649	0.861
162.0	46.57	126.0	10.3	26700.0	0.00407	0.0649	7.48	0.00273	1.39477	2.12
162.0	0.9417	35.0	2.19	46.3	0.00858	0.00536	0.432	0.0190	1.00711	0.870
164.0	46.20	123.0	10.1	25200.0	0.00417	0.0637	7.24	0.00268	1.39128	2.10
164.0	1.030	35.1	2.20	50.3	0.00868	0.00546	0.438	0.0174	1.00778	0.880
166.0	45.82	121.0	9.83	23700.0	0.00428	0.0626	7.00	0.00264	1.38774	2.09
166.0	1.124	35.2	2.20	54.6	0.00879	0.00556	0.445	0.0160	1.00849	0.891
168.0	45.44	119.0	9.61	22400.0	0.00440	0.0614	6.77	0.00259	1.38415	2.07
168.0	1.220	35.2	2.20	59.0	0.00892	0.00567	0.453	0.0147	1.00926	0.902

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID NITROGEN

TEMP	PRESS	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND	SURFACE TENSION
DEG. R	PSIA	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB B	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC	LB/IN X 10^5
170.0	75.18	0.02220	467.0	95.2	-36.92	-36.61	0.7782	0.225	0.526	2249.0	2.935
170.0	75.18	0.7498	47.7	0.577	26.91	37.35	1.214	0.196	0.319	600.4	
172.0	81.87	0.02240	443.0	92.0	-35.89	-35.55	0.7843	0.224	0.530	2201.0	2.805
172.0	81.87	0.6901	47.2	0.631	27.03	37.49	1.209	0.197	0.325	601.0	
174.0	88.98	0.02260	419.0	89.0	-34.85	-34.48	0.7903	0.224	0.535	2153.0	2.677
174.0	88.98	0.6360	46.7	0.690	27.13	37.61	1.205	0.198	0.331	601.5	
176.0	96.53	0.02281	397.0	86.0	-33.81	-33.40	0.7963	0.224	0.540	2106.0	2.549
176.0	96.53	0.5869	46.1	0.754	27.23	37.72	1.201	0.199	0.337	601.8	
178.0	104.5	0.02303	375.0	83.1	-32.76	-32.31	0.8023	0.224	0.546	2059.0	2.423
178.0	104.5	0.5422	45.4	0.823	27.30	37.80	1.196	0.200	0.345	601.9	
180.0	113.0	0.02326	353.0	80.3	-31.70	-31.21	0.8082	0.223	0.552	2012.0	2.299
180.0	113.0	0.5015	44.7	0.897	27.36	37.86	1.192	0.201	0.352	601.9	
182.0	121.9	0.02350	333.0	77.5	-30.63	-30.10	0.8141	0.223	0.559	1965.0	2.176
182.0	121.9	0.4643	43.9	0.978	27.41	37.89	1.188	0.202	0.361	601.8	
184.0	131.4	0.02374	313.0	74.8	-29.55	-28.97	0.8201	0.223	0.567	1918.0	2.054
184.0	131.4	0.4303	43.0	1.06	27.44	37.90	1.184	0.204	0.370	601.5	
186.0	141.3	0.02400	293.0	72.1	-28.46	-27.84	0.8260	0.223	0.575	1871.0	1.934
186.0	141.3	0.3990	42.0	1.16	27.44	37.89	1.179	0.205	0.380	601.0	
188.0	151.8	0.02427	274.0	69.5	-27.37	-26.68	0.8319	0.223	0.584	1824.0	1.815
188.0	151.8	0.3703	41.0	1.26	27.43	37.84	1.175	0.206	0.392	600.4	
190.0	162.8	0.02455	256.0	66.9	-26.25	-25.51	0.8378	0.223	0.594	1777.0	1.698
190.0	162.8	0.3439	39.9	1.37	27.40	37.77	1.171	0.208	0.404	599.7	
192.0	174.4	0.02485	238.0	64.4	-25.13	-24.33	0.8437	0.223	0.605	1730.0	1.583
192.0	174.4	0.3195	38.7	1.49	27.34	37.66	1.167	0.209	0.418	598.8	
194.0	186.6	0.02516	221.0	61.9	-23.99	-23.12	0.8497	0.223	0.618	1683.0	1.469
194.0	186.6	0.2969	37.5	1.62	27.26	37.52	1.162	0.211	0.434	597.7	
196.0	199.4	0.02549	204.0	59.4	-22.84	-21.90	0.8557	0.223	0.632	1635.0	1.357
196.0	199.4	0.2760	36.1	1.77	27.15	37.35	1.158	0.213	0.452	596.5	
198.0	212.8	0.02583	188.0	57.0	-21.67	-20.65	0.8617	0.224	0.648	1587.0	1.248
198.0	212.8	0.2566	34.7	1.92	27.01	37.13	1.154	0.214	0.472	595.1	
200.0	226.9	0.02620	172.0	54.6	-20.48	-19.38	0.8677	0.224	0.666	1538.0	1.140
200.0	226.9	0.2385	33.2	2.10	26.84	36.86	1.149	0.216	0.495	593.6	
202.0	241.5	0.02659	156.0	52.3	-19.27	-18.08	0.8738	0.224	0.687	1489.0	1.034
202.0	241.5	0.2217	31.6	2.29	26.63	36.55	1.144	0.218	0.522	591.9	
204.0	256.9	0.02701	141.0	49.9	-18.03	-16.75	0.8800	0.225	0.711	1439.0	0.9308
204.0	256.9	0.2059	29.8	2.50	26.38	36.18	1.139	0.220	0.554	590.1	
206.0	273.0	0.02747	126.0	47.6	-16.77	-15.38	0.8863	0.225	0.740	1388.0	0.8298
206.0	273.0	0.1912	28.0	2.73	26.09	35.75	1.134	0.222	0.592	588.1	
208.0	289.8	0.02796	112.0	45.2	-15.48	-13.98	0.8927	0.226	0.775	1335.0	0.7314
208.0	289.8	0.1773	26.1	2.99	25.74	35.25	1.129	0.225	0.638	586.0	
210.0	307.3	0.02849	98.0	42.9	-14.14	-12.52	0.8992	0.226	0.818	1281.0	0.6358
210.0	307.3	0.1642	24.0	3.28	25.33	34.68	1.124	0.227	0.695	583.7	
212.0	325.6	0.02909	84.4	40.5	-12.76	-11.00	0.9059	0.227	0.872	1226.0	0.5431
212.0	325.6	0.1518	21.9	3.60	24.85	34.00	1.118	0.230	0.767	581.3	
214.0	344.7	0.02975	71.2	38.1	-11.32	-9.427	0.9129	0.228	0.943	1168.0	0.4537
214.0	344.7	0.1400	19.6	3.98	24.29	33.22	1.112	0.233	0.861	578.8	
216.0	364.5	0.03050	58.4	35.6	-9.810	-7.750	0.9202	0.229	1.04	1108.0	0.3679
216.0	364.5	0.1287	17.1	4.41	23.61	32.30	1.106	0.236	0.988	576.3	
218.0	385.3	0.03139	46.1	33.1	-8.192	-5.953	0.9279	0.231	1.18	1044.0	0.2862
218.0	385.3	0.1177	14.5	4.92	22.80	31.20	1.098	0.239	1.17	573.7	
220.0	406.9	0.03246	34.3	30.4	-6.431	-3.985	0.9363	0.233	1.39	975.2	0.2093
220.0	406.9	0.1070	11.8	5.53	21.80	29.86	1.090	0.243	1.46	571.1	
222.0	429.4	0.03383	23.1	27.6	-4.445	-1.755	0.9458	0.235	1.78	900.4	0.1380
222.0	429.4	0.09619	6.79	6.31	20.52	28.16	1.081	0.248	1.97	568.7	
224.0	453.0	0.03578	12.8	24.3	-2.047	0.9528	0.9572	0.240	2.69	815.6	0.07397
224.0	453.0	0.08474	5.59	7.36	18.73	25.84	1.068	0.253	3.14	567.0	
226.0	477.9	0.03942	3.78	20.0	1.460	4.949	0.9742	0.247	7.12	710.2	0.02069
226.0	477.9	0.07072	2.10	9.15	15.66	21.92	1.049	0.260	8.59	568.0	
* 227.200	493.1	0.05102		13.5	8.594	13.25	1.010				0.00000
* 227.200	493.1	0.05102		13.5	8.594	13.25	1.010				

THERMODYNAMIC PROPERTIES OF COEXISTING GASEOUS AND LIQUID NITROGEN

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$-(\partial V/\partial T)_P/V$ DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFUSIFITYTY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
170.0	45.04	116.0	9.40	21000.0	0.00452	0.0603	6.55	0.00255	1.38052	2.06
170.0	1.334	35.2	2.21	63.7	0.00906	0.00578	0.460	0.0136	1.01008	0.914
172.0	44.65	114.0	9.18	19800.0	0.00465	0.0591	6.33	0.00250	1.37682	2.04
172.0	1.443	35.2	2.21	68.5	0.00922	0.00589	0.467	0.0125	1.01095	0.928
174.0	44.24	112.0	8.97	18600.0	0.00479	0.0580	6.12	0.00245	1.37308	2.03
174.0	1.572	35.2	2.22	73.4	0.00940	0.00600	0.475	0.0115	1.01189	0.942
176.0	43.83	109.0	8.76	17400.0	0.00495	0.0569	5.91	0.00240	1.36927	2.02
176.0	1.704	35.1	2.22	78.5	0.00960	0.00613	0.482	0.0107	1.01289	0.957
178.0	43.42	107.0	8.56	16300.0	0.00511	0.0557	5.71	0.00235	1.36540	2.01
178.0	1.844	35.1	2.23	83.7	0.00983	0.00625	0.490	0.00984	1.01396	0.973
180.0	42.99	105.0	8.35	15200.0	0.00528	0.0546	5.51	0.00230	1.36146	2.01
180.0	1.994	35.0	2.24	89.1	0.0101	0.00638	0.498	0.00908	1.01510	0.991
182.0	42.56	102.0	8.15	14200.0	0.00547	0.0535	5.32	0.00225	1.35746	2.00
182.0	2.154	34.9	2.24	94.5	0.0103	0.00652	0.507	0.00839	1.01631	1.01
184.0	42.11	100.0	7.95	13200.0	0.00568	0.0524	5.13	0.00219	1.35338	2.00
184.0	2.324	34.7	2.25	100.0	0.0107	0.00666	0.515	0.00774	1.01761	1.03
186.0	41.66	97.4	7.76	12200.0	0.00590	0.0513	4.95	0.00214	1.34922	2.00
186.0	2.506	34.6	2.26	105.0	0.0110	0.00681	0.524	0.00714	1.01900	1.05
188.0	41.20	95.0	7.56	11300.0	0.00615	0.0502	4.77	0.00208	1.34497	2.00
188.0	2.700	34.4	2.26	111.0	0.0114	0.00697	0.532	0.00659	1.02048	1.08
190.0	40.73	92.6	7.36	10400.0	0.00642	0.0491	4.59	0.00203	1.34064	2.00
190.0	2.908	34.2	2.27	116.0	0.0118	0.00713	0.542	0.00607	1.02207	1.10
192.0	40.24	90.1	7.17	9580.0	0.00672	0.0480	4.42	0.00197	1.33620	2.01
192.0	3.130	34.0	2.28	121.0	0.0123	0.00731	0.551	0.00559	1.02377	1.13
194.0	39.75	87.6	6.97	8780.0	0.00705	0.0469	4.25	0.00191	1.33166	2.02
194.0	3.368	33.7	2.29	126.0	0.0129	0.00750	0.561	0.00513	1.02560	1.17
196.0	39.23	85.1	6.78	8000.0	0.00743	0.0458	4.08	0.00185	1.32700	2.03
196.0	3.623	33.5	2.30	131.0	0.0135	0.00771	0.571	0.00471	1.02755	1.20
198.0	38.71	82.5	6.59	7260.0	0.00785	0.0447	3.92	0.00178	1.32221	2.04
198.0	3.897	33.2	2.30	135.0	0.0142	0.00793	0.581	0.00431	1.02966	1.24
200.0	38.16	79.9	6.39	6550.0	0.00834	0.0436	3.76	0.00172	1.31728	2.07
200.0	4.192	32.9	2.31	139.0	0.0151	0.00818	0.592	0.00394	1.03193	1.29
202.0	37.60	77.2	6.20	5870.0	0.00890	0.0425	3.60	0.00165	1.31218	2.09
202.0	4.511	32.5	2.32	142.0	0.0161	0.00845	0.603	0.00359	1.03439	1.34
204.0	37.02	74.4	6.00	5220.0	0.00956	0.0414	3.44	0.00157	1.30690	2.13
204.0	4.856	32.2	2.33	145.0	0.0172	0.00876	0.615	0.00325	1.03706	1.40
206.0	36.41	71.6	5.81	4600.0	0.0103	0.0404	3.28	0.00150	1.30141	2.17
206.0	5.231	31.8	2.34	147.0	0.0186	0.00910	0.627	0.00294	1.03996	1.47
208.0	35.77	68.7	5.60	4000.0	0.0113	0.0393	3.13	0.00142	1.29567	2.22
208.0	5.641	31.5	2.36	147.0	0.0203	0.00950	0.641	0.00264	1.04314	1.55
210.0	35.10	65.6	5.40	3440.0	0.0125	0.0383	2.97	0.00133	1.28964	2.29
210.0	6.091	31.1	2.37	146.0	0.0224	0.0100	0.655	0.00236	1.04664	1.64
212.0	34.38	62.5	5.19	2900.0	0.0140	0.0373	2.82	0.00124	1.28326	2.37
212.0	6.583	30.7	2.38	144.0	0.0250	0.0105	0.670	0.00208	1.05052	1.76
214.0	33.62	59.2	4.97	2390.0	0.0159	0.0364	2.66	0.00115	1.27643	2.48
214.0	7.144	30.2	2.39	140.0	0.0285	0.0112	0.687	0.00182	1.05486	1.90
216.0	32.78	55.8	4.74	1920.0	0.0186	0.0355	2.50	0.00104	1.26903	2.64
216.0	7.772	29.8	2.40	133.0	0.0332	0.0120	0.705	0.00157	1.05978	2.08
218.0	31.86	52.2	4.50	1470.0	0.0225	0.0347	2.34	0.000927	1.26087	2.86
218.0	8.494	29.4	2.42	123.0	0.0399	0.0131	0.726	0.00132	1.06546	2.34
220.0	30.81	48.3	4.25	1060.0	0.0288	0.0340	2.17	0.000793	1.25163	3.20
220.0	9.346	28.9	2.43	110.0	0.0504	0.0145	0.751	0.00107	1.07220	2.71
222.0	29.56	44.2	3.96	684.0	0.0403	0.0336	1.99	0.000637	1.24070	3.80
222.0	10.40	28.5	2.45	91.4	0.0690	0.0166	0.780	0.000809	1.06054	3.34
224.0	27.95	39.6	3.63	357.0	0.0680	0.0336	1.78	0.000446	1.22667	5.14
224.0	11.80	28.1	2.47	66.0	0.112	0.0193	0.821	0.000537	1.09177	4.66
226.0	25.37	34.1	3.19	95.8	0.209	0.0364	1.51	0.000201	1.20438	10.6
226.0	14.14	27.9	2.49	29.7	0.308	0.0283	0.891	0.000233	1.11066	9.75
* 227.200	19.60								1.15559	
* 227.200	19.60								1.15559	

THERMODYNAMIC PROPERTIES OF NITROGEN

1 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	43.83	43.6	0.00878	20.22	28.33	1.441	0.1783	0.2507	533.0
120.0	45.77	45.6	0.00841	21.11	29.59	1.452	0.1781	0.2503	544.7
125.0	47.70	47.5	0.00806	22.00	30.84	1.462	0.1780	0.2500	556.1
130.0	49.63	49.5	0.00774	22.90	32.09	1.472	0.1779	0.2498	567.2
135.0	51.56	51.4	0.00745	23.79	33.34	1.481	0.1778	0.2496	578.2
140.0	53.48	53.3	0.00718	24.68	34.58	1.491	0.1777	0.2494	588.9
145.0	55.41	55.3	0.00693	25.57	35.83	1.499	0.1777	0.2493	599.4
150.0	57.33	57.2	0.00670	26.46	37.08	1.508	0.1776	0.2492	609.7
155.0	59.26	59.1	0.00648	27.35	38.32	1.516	0.1776	0.2491	619.9
160.0	61.18	61.1	0.00627	28.24	39.57	1.524	0.1776	0.2490	629.9
165.0	63.10	63.0	0.00608	29.13	40.81	1.532	0.1775	0.2489	639.7
170.0	65.02	64.9	0.00590	30.02	42.06	1.539	0.1775	0.2489	649.4
175.0	66.95	66.8	0.00573	30.90	43.30	1.546	0.1775	0.2488	658.9
180.0	68.87	68.8	0.00557	31.79	44.55	1.553	0.1775	0.2488	668.3
185.0	70.78	70.7	0.00642	32.68	45.79	1.560	0.1774	0.2487	677.6
190.0	72.70	72.6	0.00527	33.57	47.03	1.567	0.1774	0.2487	686.7
200.0	76.54	76.5	0.00501	35.34	49.52	1.579	0.1774	0.2486	704.6
205.0	78.46	78.4	0.00489	36.23	50.76	1.585	0.1774	0.2486	713.4
210.0	80.38	80.3	0.00477	37.12	52.00	1.591	0.1774	0.2486	722.1
215.0	82.30	82.2	0.00466	38.01	53.25	1.597	0.1774	0.2485	730.6
220.0	84.21	84.2	0.00455	38.89	54.49	1.603	0.1774	0.2485	739.1
225.0	86.13	86.1	0.00445	39.78	55.73	1.609	0.1774	0.2485	747.5
230.0	88.05	88.0	0.00435	40.67	56.97	1.614	0.1774	0.2485	755.8
235.0	89.97	89.9	0.00426	41.56	58.22	1.619	0.1774	0.2485	763.9
240.0	91.88	91.8	0.00417	42.44	59.46	1.625	0.1774	0.2485	772.0
245.0	93.80	93.8	0.00409	43.33	60.70	1.630	0.1773	0.2484	780.1
250.0	95.72	95.7	0.00400	44.22	61.94	1.635	0.1773	0.2484	788.0
255.0	97.64	97.6	0.00393	45.11	63.19	1.640	0.1773	0.2484	795.8
260.0	99.6	100.0	0.00385	45.99	64.43	1.645	0.1773	0.2484	803.6
265.0	101.5	101.0	0.00378	46.88	65.67	1.649	0.1773	0.2484	811.3
270.0	103.4	103.0	0.00371	47.77	66.91	1.654	0.1773	0.2484	819.0
275.0	105.3	105.0	0.00364	48.65	68.15	1.658	0.1773	0.2484	826.5
280.0	107.2	107.0	0.00357	49.54	69.40	1.663	0.1773	0.2484	834.0
285.0	109.1	109.0	0.00351	50.43	70.64	1.667	0.1773	0.2484	841.4
290.0	111.1	111.0	0.00345	51.31	71.88	1.672	0.1773	0.2484	848.8
295.0	113.0	113.0	0.00339	52.20	73.12	1.676	0.1773	0.2484	856.1
300.0	114.9	115.0	0.00334	53.09	74.36	1.680	0.1773	0.2483	863.3
310.0	118.7	119.0	0.00323	54.86	76.85	1.688	0.1773	0.2483	877.6
320.0	122.6	123.0	0.00313	56.63	79.33	1.696	0.1773	0.2483	891.7
330.0	126.4	126.0	0.00303	58.41	81.81	1.704	0.1773	0.2483	905.5
340.0	130.2	130.0	0.00294	60.18	84.30	1.711	0.1773	0.2483	919.1
350.0	134.1	134.0	0.00286	61.95	86.78	1.718	0.1773	0.2483	932.6
360.0	137.9	138.0	0.00278	63.73	89.27	1.725	0.1773	0.2483	945.8
370.0	141.7	142.0	0.00270	65.50	91.75	1.732	0.1773	0.2483	958.9
380.0	145.6	146.0	0.00263	67.27	94.23	1.739	0.1773	0.2483	971.7
390.0	149.4	149.0	0.00256	69.05	96.71	1.745	0.1773	0.2483	984.4
400.0	153.2	153.0	0.00250	70.82	99.20	1.752	0.1773	0.2483	997.0
410.0	157.1	157.0	0.00244	72.59	101.7	1.758	0.1773	0.2483	1009.0
420.0	160.9	161.0	0.00238	74.37	104.2	1.764	0.1773	0.2483	1022.0
430.0	164.7	165.0	0.00233	76.14	106.6	1.769	0.1773	0.2483	1034.0
440.0	168.6	169.0	0.00227	77.91	109.1	1.775	0.1773	0.2483	1046.0
450.0	172.4	172.0	0.00222	79.69	111.6	1.781	0.1773	0.2483	1057.0
460.0	176.2	176.0	0.00217	81.46	114.1	1.786	0.1773	0.2483	1069.0
470.0	180.0	180.0	0.00213	83.23	116.6	1.792	0.1773	0.2483	1081.0
480.0	183.9	184.0	0.00208	85.01	119.1	1.797	0.1773	0.2483	1092.0
490.0	187.7	188.0	0.00204	86.78	121.5	1.802	0.1773	0.2483	1103.0
500.0	191.5	192.0	0.00200	88.55	124.0	1.807	0.1773	0.2483	1115.0
510.0	195.4	195.0	0.00196	90.33	126.5	1.812	0.1773	0.2483	1126.0
520.0	199.2	199.0	0.00192	92.10	129.0	1.817	0.1774	0.2483	1137.0
530.0	203.0	203.0	0.00189	93.87	131.5	1.821	0.1774	0.2483	1148.0
540.0	206.9	207.0	0.00185	95.65	134.0	1.826	0.1774	0.2483	1158.0
550.0	210.7	211.0	0.00182	97.42	136.4	1.831	0.1774	0.2484	1169.0
560.0	214.5	215.0	0.00179	99.20	138.9	1.835	0.1774	0.2484	1180.0
570.0	218.4	218.0	0.00175	101.0	141.4	1.839	0.1775	0.2484	1190.0
580.0	222.2	222.0	0.00172	102.7	143.9	1.844	0.1775	0.2484	1200.0
590.0	226.0	226.0	0.00170	104.5	146.4	1.848	0.1775	0.2485	1211.0
600.0	229.8	230.0	0.00167	106.3	148.9	1.852	0.1776	0.2485	1221.0
700.0	268.2	268.0	0.00143	124.1	173.7	1.891	0.1782	0.2491	1318.0
800.0	306.5	306.0	0.00125	142.0	198.7	1.924	0.1794	0.2503	1408.0
900.0	344.8	345.0	0.00111	160.0	223.8	1.953	0.1812	0.2521	1491.0
1000.0	383.1	383.0	0.00100	178.2	249.1	1.980	0.1835	0.2544	1569.0
1500.0	574.6	575.0	0.000667	273.6	380.0	2.086	0.1987	0.2696	1901.0
2000.0	766.2	766.0	0.000500	376.6	518.5	2.166	0.2125	0.2839	2176.0
2500.0	957.7	958.0	0.000400	485.5	662.8	2.230	0.2224	0.2934	2419.0
3000.0	1149.0	1150.0	0.000333	598.5	811.3	2.284	0.2293	0.3002	2640.0
3500.0	1341.0	1340.0	0.000286	714.4	962.7	2.331	0.2340	0.3050	2845.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

1 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	0.02281	28.4	2.16	0.995	0.00883	0.00355	0.303	0.620	1.00017	0.771
120.0	0.02185	29.6	2.16	1.00	0.00844	0.00370	0.313	0.676	1.00016	0.763
125.0	0.02096	30.9	2.16	1.00	0.00809	0.00385	0.323	0.734	1.00016	0.756
130.0	0.02015	32.1	2.16	1.00	0.00777	0.00400	0.334	0.795	1.00015	0.752
135.0	0.01940	33.4	2.16	1.00	0.00747	0.00415	0.346	0.858	1.00015	0.748
140.0	0.01870	34.6	2.16	1.00	0.00720	0.00430	0.357	0.923	1.00014	0.745
145.0	0.01805	35.9	2.16	1.00	0.00695	0.00446	0.369	0.990	1.00014	0.743
150.0	0.01744	37.1	2.16	1.00	0.00671	0.00461	0.381	1.06	1.00013	0.742
155.0	0.01688	38.4	2.16	1.00	0.00649	0.00476	0.393	1.13	1.00013	0.740
160.0	0.01635	39.6	2.16	1.00	0.00628	0.00491	0.405	1.21	1.00012	0.739
165.0	0.01585	40.9	2.16	1.00	0.00609	0.00506	0.417	1.28	1.00012	0.739
170.0	0.01538	42.1	2.16	1.00	0.00591	0.00521	0.429	1.36	1.00012	0.738
175.0	0.01494	43.4	2.16	1.00	0.00574	0.00536	0.442	1.44	1.00011	0.738
180.0	0.01452	44.6	2.16	1.00	0.00558	0.00551	0.454	1.53	1.00011	0.737
185.0	0.01413	45.8	2.16	1.00	0.00542	0.00566	0.466	1.61	1.00011	0.737
190.0	0.01376	47.1	2.16	1.00	0.00528	0.00581	0.478	1.70	1.00010	0.737
200.0	0.01307	49.6	2.16	1.00	0.00501	0.00611	0.503	1.88	1.00010	0.736
205.0	0.01275	50.8	2.16	1.00	0.00489	0.00626	0.515	1.98	1.00010	0.736
210.0	0.01244	52.1	2.16	1.00	0.00477	0.00641	0.527	2.07	1.00009	0.736
215.0	0.01215	53.3	2.16	1.00	0.00466	0.00656	0.539	2.17	1.00009	0.735
220.0	0.01187	54.6	2.16	1.00	0.00456	0.00671	0.551	2.27	1.00009	0.735
225.0	0.01161	55.8	2.16	1.00	0.00445	0.00686	0.563	2.38	1.00009	0.735
230.0	0.01136	57.0	2.16	1.00	0.00436	0.00700	0.575	2.48	1.00009	0.735
235.0	0.01112	58.3	2.16	1.00	0.00426	0.00715	0.587	2.59	1.00008	0.734
240.0	0.01088	59.5	2.16	1.00	0.00417	0.00730	0.599	2.70	1.00008	0.734
245.0	0.01066	60.8	2.16	1.00	0.00409	0.00744	0.611	2.81	1.00008	0.734
250.0	0.01045	62.0	2.16	1.00	0.00401	0.00759	0.622	2.92	1.00008	0.734
255.0	0.01024	63.3	2.16	1.00	0.00393	0.00773	0.634	3.04	1.00008	0.733
260.0	0.01004	64.5	2.16	1.00	0.00385	0.00787	0.646	3.16	1.00008	0.733
265.0	0.009855	65.7	2.16	1.00	0.00378	0.00802	0.657	3.28	1.00007	0.733
270.0	0.009672	67.0	2.16	1.00	0.00371	0.00816	0.669	3.40	1.00007	0.733
275.0	0.009495	68.2	2.16	1.00	0.00364	0.00830	0.680	3.52	1.00007	0.732
280.0	0.009326	69.5	2.16	1.00	0.00358	0.00844	0.691	3.65	1.00007	0.732
285.0	0.009163	70.7	2.16	1.00	0.00351	0.00858	0.703	3.77	1.00007	0.732
290.0	0.009005	72.0	2.16	1.00	0.00345	0.00872	0.714	3.90	1.00007	0.732
295.0	0.008852	73.2	2.16	1.00	0.00339	0.00886	0.725	4.03	1.00007	0.731
300.0	0.008704	74.4	2.16	1.00	0.00333	0.00900	0.736	4.16	1.00007	0.731
310.0	0.008423	76.9	2.16	1.00	0.00323	0.00928	0.758	4.44	1.00006	0.731
320.0	0.008160	79.4	2.16	1.00	0.00313	0.00955	0.780	4.71	1.00006	0.730
330.0	0.007912	81.9	2.16	1.00	0.00303	0.00982	0.802	5.00	1.00006	0.730
340.0	0.007679	84.4	2.16	1.00	0.00294	0.0101	0.823	5.29	1.00006	0.729
350.0	0.007460	86.9	2.16	1.00	0.00286	0.0104	0.844	5.59	1.00006	0.729
360.0	0.007251	89.3	2.16	1.00	0.00278	0.0106	0.865	5.90	1.00005	0.728
370.0	0.007055	91.8	2.16	1.00	0.00270	0.0109	0.886	6.21	1.00005	0.728
380.0	0.006870	94.3	2.16	1.00	0.00263	0.0111	0.906	6.53	1.00005	0.727
390.0	0.006694	96.8	2.16	1.00	0.00257	0.0114	0.926	6.85	1.00005	0.727
400.0	0.006526	99.3	2.16	1.00	0.00250	0.0116	0.946	7.18	1.00005	0.727
410.0	0.006367	102.0	2.16	1.00	0.00244	0.0119	0.966	7.52	1.00005	0.726
420.0	0.006215	104.0	2.16	1.00	0.00238	0.0121	0.986	7.87	1.00005	0.726
430.0	0.006071	107.0	2.16	1.00	0.00233	0.0124	1.01	8.22	1.00005	0.725
440.0	0.005933	109.0	2.16	1.00	0.00227	0.0126	1.02	8.57	1.00004	0.725
450.0	0.005801	112.0	2.16	1.00	0.00222	0.0129	1.04	8.94	1.00004	0.725
460.0	0.005675	114.0	2.16	1.00	0.00217	0.0131	1.06	9.30	1.00004	0.724
470.0	0.005554	117.0	2.16	1.00	0.00213	0.0133	1.08	9.68	1.00004	0.724
480.0	0.005438	119.0	2.16	1.00	0.00208	0.0136	1.10	10.1	1.00004	0.724
490.0	0.005327	122.0	2.16	1.00	0.00204	0.0138	1.12	10.4	1.00004	0.723
500.0	0.005221	124.0	2.16	1.00	0.00200	0.0140	1.14	10.8	1.00004	0.723
510.0	0.005119	127.0	2.16	1.00	0.00196	0.0143	1.15	11.2	1.00004	0.723
520.0	0.005020	129.0	2.16	1.00	0.00192	0.0145	1.17	11.6	1.00004	0.722
530.0	0.004925	132.0	2.16	1.00	0.00189	0.0147	1.19	12.0	1.00004	0.722
540.0	0.004834	134.0	2.16	1.00	0.00185	0.0150	1.21	12.5	1.00004	0.722
550.0	0.004745	137.0	2.16	1.00	0.00182	0.0152	1.22	12.9	1.00004	0.721
560.0	0.004662	139.0	2.16	1.00	0.00173	0.0154	1.24	13.3	1.00004	0.721
570.0	0.004580	142.0	2.16	1.00	0.00175	0.0156	1.26	13.7	1.00003	0.721
580.0	0.004501	144.0	2.16	1.00	0.00172	0.0158	1.28	14.2	1.00003	0.721
590.0	0.004425	147.0	2.16	1.00	0.00170	0.0161	1.29	14.6	1.00003	0.720
600.0	0.004351	149.0	2.16	1.00	0.00167	0.0163	1.31	15.0	1.00003	0.720
700.0	0.003723	174.0	2.15	1.00	0.00143	0.0184	1.47	19.8	1.00003	0.718
800.0	0.003263	200.0	2.14	1.00	0.00125	0.0204	1.62	24.9	1.00002	0.716
900.0	0.002901	227.0	2.11	1.00	0.00111	0.0223	1.76	30.5	1.00002	0.714
1000.0	0.002610	254.0	2.09	1.00	0.00100	0.0243	1.89	36.5	1.00002	0.713
1500.0	0.001740	404.0	1.93	1.00	0.000667					
2000.0	0.001305	567.0	1.80	1.00	0.000500					
2500.0	0.001044	733.0	1.72	1.00	0.000400					
3000.0	0.0008701	901.0	1.67	1.00	0.000333					
3500.0	0.0007458	1070.0	1.64	1.00	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

5 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01852	1910.0	250.0	-64.06	-64.04	0.5857	0.2319	0.4708	4240.0
120.0	0.01875	1640.0	225.0	-61.67	-61.66	0.6059	0.2408	0.4816	3897.0
* 124.600	0.01893	1430.0	205.0	-59.43	-59.41	0.6243	0.2431	0.4869	3649.0
* 124.600	9.359	45.8	0.0417	21.66	30.32	1.345	0.1808	0.2577	550.1
125.0	9.388	46.0	0.0416	21.73	30.42	1.346	0.1808	0.2576	551.0
130.0	9.786	48.1	0.0398	22.64	31.70	1.356	0.1803	0.2563	562.7
135.0	10.18	50.1	0.0382	23.55	32.98	1.366	0.1798	0.2552	574.0
140.0	10.58	52.1	0.0367	24.46	34.26	1.375	0.1795	0.2544	585.1
145.0	10.97	54.1	0.0353	25.37	35.53	1.384	0.1792	0.2537	595.9
150.0	11.36	56.2	0.0341	26.27	36.79	1.392	0.1789	0.2531	606.6
155.0	11.75	58.1	0.0329	27.18	38.06	1.401	0.1787	0.2525	617.0
160.0	12.14	60.1	0.0318	28.08	39.32	1.409	0.1786	0.2521	627.2
165.0	12.53	62.1	0.0308	28.97	40.58	1.416	0.1784	0.2517	637.2
170.0	12.92	64.1	0.0299	29.87	41.84	1.424	0.1783	0.2514	647.1
175.0	13.31	66.1	0.0290	30.77	43.09	1.431	0.1782	0.2511	656.8
180.0	13.70	68.0	0.0281	31.66	44.35	1.438	0.1781	0.2508	666.3
185.0	14.09	70.0	0.0273	32.56	45.60	1.445	0.1780	0.2506	675.7
190.0	14.47	72.0	0.0266	33.45	46.85	1.452	0.1779	0.2504	685.0
200.0	15.25	75.9	0.0252	35.24	49.36	1.465	0.1778	0.2501	703.1
205.0	15.63	77.8	0.0246	36.13	50.61	1.471	0.1778	0.2500	712.0
210.0	16.02	79.8	0.0240	37.02	51.85	1.477	0.1777	0.2498	720.8
215.0	16.41	81.7	0.0234	37.91	53.10	1.483	0.1777	0.2497	729.4
220.0	16.79	83.7	0.0229	38.80	54.35	1.488	0.1777	0.2496	738.0
225.0	17.18	85.6	0.0224	39.69	55.60	1.494	0.1776	0.2495	746.4
230.0	17.56	87.5	0.0219	40.59	56.85	1.500	0.1776	0.2495	754.8
235.0	17.95	89.5	0.0214	41.48	58.09	1.505	0.1776	0.2494	763.0
240.0	18.33	91.4	0.0210	42.37	59.34	1.510	0.1776	0.2493	771.2
245.0	18.72	93.3	0.0205	43.25	60.59	1.515	0.1775	0.2492	779.2
250.0	19.11	95.3	0.0201	44.14	61.83	1.520	0.1775	0.2492	787.2
255.0	19.49	97.2	0.0197	45.03	63.08	1.525	0.1775	0.2491	795.1
260.0	19.88	99.2	0.0193	45.92	64.33	1.530	0.1775	0.2491	803.0
265.0	20.26	101.0	0.0190	46.81	65.57	1.535	0.1775	0.2490	810.7
270.0	20.64	103.0	0.0186	47.70	66.82	1.540	0.1775	0.2490	818.4
275.0	21.03	105.0	0.0183	48.59	68.06	1.544	0.1774	0.2490	826.0
280.0	21.41	107.0	0.0179	49.48	69.31	1.549	0.1774	0.2489	833.5
285.0	21.80	109.0	0.0176	50.37	70.55	1.553	0.1774	0.2489	840.9
290.0	22.18	111.0	0.0173	51.26	71.79	1.557	0.1774	0.2489	848.3
295.0	22.57	113.0	0.0170	52.14	73.04	1.562	0.1774	0.2488	855.7
300.0	22.95	115.0	0.0167	53.03	74.28	1.566	0.1774	0.2488	862.9
310.0	23.72	118.0	0.0162	54.81	76.77	1.574	0.1774	0.2488	877.3
320.0	24.49	122.0	0.0157	56.58	79.26	1.582	0.1774	0.2487	891.4
330.0	25.26	126.0	0.0152	58.36	81.74	1.589	0.1774	0.2487	905.2
340.0	26.02	130.0	0.0147	60.13	84.23	1.597	0.1774	0.2486	918.9
350.0	26.79	134.0	0.0143	61.91	86.72	1.604	0.1774	0.2486	932.4
360.0	27.56	138.0	0.0139	63.69	89.20	1.611	0.1773	0.2486	945.7
370.0	28.33	142.0	0.0135	65.46	91.69	1.618	0.1773	0.2486	958.7
380.0	29.10	145.0	0.0132	67.23	94.17	1.625	0.1773	0.2485	971.6
390.0	29.86	149.0	0.0128	69.01	96.66	1.631	0.1773	0.2485	984.4
400.0	30.63	153.0	0.0125	70.78	99.14	1.637	0.1773	0.2485	997.0
410.0	31.40	157.0	0.0122	72.56	101.6	1.643	0.1773	0.2485	1009.0
420.0	32.17	161.0	0.0119	74.33	104.1	1.649	0.1773	0.2485	1022.0
430.0	32.93	165.0	0.0116	76.11	106.6	1.655	0.1773	0.2485	1034.0
440.0	33.70	168.0	0.0114	77.88	109.1	1.661	0.1773	0.2484	1046.0
450.0	34.47	172.0	0.0111	79.66	111.6	1.667	0.1773	0.2484	1058.0
460.0	35.23	176.0	0.0109	81.43	114.1	1.672	0.1773	0.2484	1069.0
470.0	36.00	180.0	0.0107	83.20	116.5	1.677	0.1773	0.2484	1081.0
480.0	36.77	184.0	0.0104	84.98	119.0	1.683	0.1773	0.2484	1092.0
490.0	37.53	188.0	0.0102	86.75	121.5	1.688	0.1773	0.2484	1104.0
500.0	38.30	191.0	0.0100	88.53	124.0	1.693	0.1773	0.2484	1115.0
510.0	39.07	195.0	0.00981	90.30	126.5	1.698	0.1774	0.2484	1126.0
520.0	39.84	199.0	0.00962	92.07	129.0	1.702	0.1774	0.2484	1137.0
530.0	40.60	203.0	0.00944	93.85	131.4	1.707	0.1774	0.2484	1148.0
540.0	41.37	207.0	0.00927	95.62	133.9	1.712	0.1774	0.2485	1158.0
550.0	42.14	211.0	0.00910	97.40	136.4	1.716	0.1774	0.2485	1169.0
560.0	42.90	215.0	0.00894	99.17	138.9	1.721	0.1774	0.2485	1180.0
570.0	43.67	218.0	0.00878	100.9	141.4	1.725	0.1775	0.2485	1190.0
560.0	44.44	222.0	0.00863	102.7	143.9	1.730	0.1775	0.2485	1201.0
590.0	45.20	226.0	0.00848	104.5	146.4	1.734	0.1775	0.2486	1211.0
600.0	45.97	230.0	0.00834	106.3	148.8	1.738	0.1776	0.2486	1221.0
700.0	53.63	268.0	0.00715	124.1	173.7	1.776	0.1782	0.2492	1318.0
800.0	61.30	307.0	0.00625	141.9	198.7	1.810	0.1794	0.2504	1408.0
900.0	68.96	345.0	0.00556	160.0	223.8	1.839	0.1812	0.2521	1491.0
1000.0	76.63	383.0	0.00500	178.2	249.1	1.866	0.1835	0.2544	1569.0
1500.0	114.9	575.0	0.00333	273.6	380.0	1.972	0.1987	0.2696	1901.0
2000.0	153.2	766.0	0.00250	376.6	518.5	2.051	0.2125	0.2835	2176.0
2500.0	191.6	958.0	0.00200	485.5	662.8	2.116	0.2224	0.2934	2419.0
3000.0	229.9	1150.0	0.00167	598.5	811.3	2.170	0.2293	0.3002	2641.0
3500.0	268.2	1340.0	0.00143	714.4	962.7	2.217	0.2340	0.3050	2845.0

*, TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

5 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^3	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.00	194.0	20.0	103000.0	0.00242	0.0940	19.7	0.00370	1.46528	3.56
120.0	53.33	187.0	17.5	87400.0	0.00257	0.0906	16.7	0.00354	1.45885	3.20
* 124.600	52.68	179.0	16.0	75600.0	0.00271	0.0879	14.7	0.00343	1.45263	2.93
* 124.600	0.1068	30.2	2.16	4.90	0.00852	0.00387	0.325	0.141	1.00080	0.778
125.0	0.1065	30.3	2.16	4.90	0.00849	0.00389	0.326	0.142	1.00080	0.777
130.0	0.1022	31.6	2.16	4.91	0.00811	0.00404	0.336	0.154	1.00077	0.769
135.0	0.09821	32.9	2.16	4.92	0.00776	0.00419	0.348	0.167	1.00074	0.763
140.0	0.09455	34.2	2.16	4.93	0.00744	0.00434	0.359	0.180	1.00071	0.758
145.0	0.09116	35.4	2.16	4.94	0.00716	0.00449	0.371	0.194	1.00069	0.755
150.0	0.08802	36.7	2.16	4.94	0.00689	0.00464	0.383	0.208	1.00066	0.752
155.0	0.08509	38.0	2.16	4.95	0.00665	0.00479	0.395	0.223	1.00064	0.749
160.0	0.08235	39.2	2.16	4.95	0.00642	0.00494	0.407	0.238	1.00062	0.747
165.0	0.07979	40.5	2.16	4.96	0.00621	0.00509	0.419	0.253	1.00060	0.746
170.0	0.07739	41.8	2.16	4.96	0.00602	0.00524	0.431	0.269	1.00058	0.744
175.0	0.07513	43.0	2.16	4.96	0.00584	0.00539	0.443	0.286	1.00057	0.743
180.0	0.07300	44.3	2.16	4.97	0.00566	0.00554	0.455	0.302	1.00055	0.742
185.0	0.07099	45.5	2.16	4.97	0.00550	0.00569	0.468	0.320	1.00053	0.742
190.0	0.06909	46.8	2.16	4.97	0.00535	0.00584	0.480	0.337	1.00052	0.741
200.0	0.06558	49.3	2.16	4.98	0.00507	0.00614	0.504	0.374	1.00049	0.740
205.0	0.06396	50.6	2.16	4.98	0.00494	0.00629	0.516	0.393	1.00048	0.739
210.0	0.06242	51.8	2.16	4.98	0.00482	0.00643	0.528	0.413	1.00047	0.739
215.0	0.06095	53.1	2.16	4.98	0.00471	0.00658	0.540	0.432	1.00046	0.738
220.0	0.05955	54.3	2.16	4.98	0.00460	0.00673	0.552	0.453	1.00045	0.738
225.0	0.05821	55.6	2.16	4.98	0.00449	0.00688	0.564	0.473	1.00044	0.737
230.0	0.05693	56.8	2.16	4.98	0.00439	0.00702	0.576	0.494	1.00043	0.737
235.0	0.05571	58.1	2.16	4.98	0.00429	0.00717	0.588	0.516	1.00042	0.737
240.0	0.05454	59.3	2.16	4.99	0.00420	0.00731	0.600	0.538	1.00041	0.736
245.0	0.05342	60.6	2.16	4.99	0.00412	0.00746	0.612	0.560	1.00040	0.736
250.0	0.05234	61.8	2.16	4.99	0.00403	0.00760	0.623	0.583	1.00039	0.735
255.0	0.05131	63.1	2.16	4.99	0.00395	0.00775	0.635	0.606	1.00039	0.735
260.0	0.05031	64.3	2.16	4.99	0.00387	0.00789	0.647	0.630	1.00038	0.735
265.0	0.04935	65.6	2.16	4.99	0.00380	0.00803	0.658	0.654	1.00037	0.734
270.0	0.04844	66.8	2.16	4.99	0.00373	0.00818	0.670	0.678	1.00036	0.734
275.0	0.04755	68.1	2.16	4.99	0.00366	0.00832	0.681	0.703	1.00036	0.734
280.0	0.04670	69.3	2.16	4.99	0.00359	0.00846	0.692	0.728	1.00035	0.733
285.0	0.04587	70.6	2.16	4.99	0.00353	0.00860	0.704	0.753	1.00035	0.733
290.0	0.04508	71.8	2.16	4.99	0.00347	0.00874	0.715	0.779	1.00034	0.733
295.0	0.04431	73.0	2.16	4.99	0.00341	0.00888	0.726	0.805	1.00033	0.733
300.0	0.04357	74.3	2.16	4.99	0.00335	0.00902	0.737	0.832	1.00033	0.732
310.0	0.04216	76.8	2.16	4.99	0.00324	0.00929	0.759	0.886	1.00032	0.732
320.0	0.04084	79.3	2.16	4.99	0.00314	0.00956	0.781	0.942	1.00031	0.731
330.0	0.03959	81.8	2.16	4.99	0.00304	0.00983	0.802	1.00	1.00030	0.730
340.0	0.03842	84.3	2.16	5.00	0.00295	0.0101	0.824	1.06	1.00029	0.730
350.0	0.03732	86.7	2.16	5.00	0.00287	0.0104	0.845	1.12	1.00028	0.729
360.0	0.03628	89.2	2.16	5.00	0.00279	0.0106	0.866	1.18	1.00027	0.729
370.0	0.03530	91.7	2.16	5.00	0.00271	0.0109	0.886	1.24	1.00027	0.728
380.0	0.03437	94.2	2.16	5.00	0.00264	0.0111	0.907	1.30	1.00026	0.728
390.0	0.03349	96.7	2.16	5.00	0.00257	0.0114	0.927	1.37	1.00025	0.727
400.0	0.03265	99.2	2.16	5.00	0.00251	0.0117	0.947	1.44	1.00025	0.727
410.0	0.03185	102.0	2.16	5.00	0.00244	0.0119	0.967	1.50	1.00024	0.727
420.0	0.03109	104.0	2.16	5.00	0.00239	0.0122	0.986	1.57	1.00023	0.726
430.0	0.03036	107.0	2.16	5.00	0.00233	0.0124	1.01	1.64	1.00023	0.726
440.0	0.02967	109.0	2.16	5.00	0.00228	0.0126	1.03	1.71	1.00022	0.725
450.0	0.02901	112.0	2.16	5.00	0.00223	0.0129	1.04	1.79	1.00022	0.725
460.0	0.02838	114.0	2.16	5.00	0.00218	0.0131	1.06	1.86	1.00021	0.725
470.0	0.02778	117.0	2.16	5.00	0.00213	0.0134	1.08	1.94	1.00021	0.724
480.0	0.02720	119.0	2.16	5.00	0.00209	0.0136	1.10	2.01	1.00020	0.724
490.0	0.02664	122.0	2.16	5.00	0.00204	0.0138	1.12	2.09	1.00020	0.724
500.0	0.02611	124.0	2.16	5.00	0.00200	0.0141	1.14	2.17	1.00020	0.723
510.0	0.02560	127.0	2.16	5.00	0.00196	0.0143	1.15	2.25	1.00019	0.723
520.0	0.02510	129.0	2.16	5.00	0.00192	0.0145	1.17	2.33	1.00019	0.723
530.0	0.02463	132.0	2.16	5.00	0.00189	0.0147	1.19	2.41	1.00019	0.722
540.0	0.02417	134.0	2.16	5.00	0.00185	0.0150	1.21	2.49	1.00018	0.722
550.0	0.02373	137.0	2.16	5.00	0.00182	0.0152	1.22	2.57	1.00018	0.722
560.0	0.02331	139.0	2.16	5.00	0.00179	0.0154	1.24	2.66	1.00018	0.721
570.0	0.02291	142.0	2.16	5.00	0.00176	0.0156	1.26	2.75	1.00017	0.721
580.0	0.02250	144.0	2.16	5.00	0.00173	0.0158	1.28	2.83	1.00017	0.721
590.0	0.02212	147.0	2.16	5.00	0.00170	0.0161	1.29	2.92	1.00017	0.720
600.0	0.02175	149.0	2.16	5.00	0.00167	0.0163	1.31	3.01	1.00016	0.720
700.0	0.01864	174.0	2.15	5.00	0.00143	0.0184	1.47	3.95	1.00014	0.718
800.0	0.01631	200.0	2.14	5.00	0.00125	0.0204	1.62	4.99	1.00012	0.716
900.0	0.01450	227.0	2.12	5.00	0.00111	0.0223	1.76	6.11	1.00011	0.714
1000.0	0.01305	254.0	2.09	5.00	0.00100	0.0243	1.89	7.31	1.00010	0.713
1500.0	0.008700	404.0	1.93	5.00	0.000667					
2000.0	0.006526	567.0	1.80	5.00	0.000500					
2500.0	0.005221	734.0	1.72	5.00	0.000400					
3000.0	0.004351	901.0	1.67	5.00	0.000333					
3500.0	0.003729	1070.0	1.64	5.00	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

10 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01852	1910.0	250.0	-64.06	-64.03	0.5856	0.2320	0.4707	4239.0
120.0	0.01875	1640.0	225.0	-61.68	-61.64	0.6059	0.2409	0.4815	3897.0
125.0	0.01900	1420.0	204.0	-59.26	-59.22	0.6257	0.2433	0.4871	3631.0
130.0	0.01927	1240.0	186.0	-56.81	-56.78	0.6448	0.2423	0.4900	3412.0
* 133.600	0.01947	1130.0	174.0	-55.05	-55.01	0.6583	0.2406	0.4914	3274.0
* 133.600	4.950	47.8	0.0798	22.99	32.16	1.311	0.1827	0.2635	565.3
135.0	5.008	48.4	0.0768	23.25	32.53	1.314	0.1825	0.2629	568.6
140.0	5.211	50.6	0.0755	24.19	33.83	1.324	0.1818	0.2611	580.2
145.0	5.413	52.7	0.0725	25.11	35.14	1.333	0.1811	0.2595	591.5
150.0	5.614	54.8	0.0697	26.04	36.43	1.342	0.1806	0.2582	602.5
155.0	5.814	56.9	0.0672	26.95	37.72	1.350	0.1802	0.2571	613.3
160.0	6.013	59.0	0.0648	27.87	39.00	1.358	0.1798	0.2562	623.8
165.0	6.211	61.0	0.0626	28.78	40.28	1.366	0.1795	0.2554	634.1
170.0	6.409	63.1	0.0606	29.69	41.56	1.374	0.1793	0.2547	644.2
175.0	6.606	65.1	0.0588	30.59	42.83	1.381	0.1791	0.2541	654.1
180.0	6.803	67.1	0.0570	31.50	44.10	1.388	0.1789	0.2535	663.8
185.0	6.999	69.1	0.0553	32.40	45.36	1.395	0.1787	0.2531	673.4
190.0	7.195	71.1	0.0538	33.30	46.63	1.402	0.1786	0.2527	682.8
200.0	7.586	75.1	0.0510	35.10	49.15	1.415	0.1783	0.2520	701.2
205.0	7.781	77.1	0.0496	36.00	50.41	1.421	0.1782	0.2517	710.3
210.0	7.976	79.1	0.0484	36.90	51.67	1.427	0.1781	0.2515	719.1
215.0	8.170	81.1	0.0472	37.79	52.92	1.433	0.1781	0.2512	727.9
220.0	8.365	83.0	0.0461	38.69	54.18	1.439	0.1780	0.2510	736.5
225.0	8.559	85.0	0.0451	39.58	55.43	1.444	0.1779	0.2509	745.1
230.0	8.753	87.0	0.0440	40.48	56.69	1.450	0.1779	0.2507	753.5
235.0	8.947	88.9	0.0431	41.37	57.94	1.455	0.1778	0.2505	761.8
240.0	9.141	90.9	0.0422	42.27	59.19	1.461	0.1778	0.2504	770.1
245.0	9.335	92.8	0.0413	43.16	60.45	1.466	0.1778	0.2503	778.2
250.0	9.528	94.8	0.0404	44.05	61.70	1.471	0.1777	0.2502	786.3
255.0	9.722	96.8	0.0396	44.94	62.95	1.476	0.1777	0.2500	794.2
260.0	9.915	98.7	0.0388	45.84	64.20	1.481	0.1777	0.2499	802.1
265.0	10.11	101.0	0.0381	46.73	65.45	1.485	0.1776	0.2499	809.9
270.0	10.30	103.0	0.0374	47.62	66.70	1.490	0.1776	0.2498	817.6
275.0	10.49	105.0	0.0367	48.51	67.94	1.495	0.1776	0.2497	825.3
280.0	10.69	107.0	0.0360	49.40	69.19	1.499	0.1776	0.2496	832.8
285.0	10.88	108.0	0.0353	50.29	70.44	1.504	0.1776	0.2496	840.3
290.0	11.07	110.0	0.0347	51.18	71.69	1.508	0.1775	0.2495	847.8
295.0	11.27	112.0	0.0341	52.07	72.94	1.512	0.1775	0.2494	855.1
300.0	11.46	114.0	0.0336	52.96	74.18	1.516	0.1775	0.2494	862.4
310.0	11.85	118.0	0.0325	54.74	76.68	1.525	0.1775	0.2493	876.8
320.0	12.23	122.0	0.0314	56.52	79.17	1.532	0.1775	0.2492	891.0
330.0	12.62	126.0	0.0305	58.30	81.66	1.540	0.1775	0.2491	904.9
340.0	13.00	130.0	0.0296	60.08	84.15	1.548	0.1774	0.2491	918.7
350.0	13.39	134.0	0.0287	61.85	86.64	1.555	0.1774	0.2490	932.2
360.0	13.77	137.0	0.0279	63.63	89.13	1.562	0.1774	0.2489	945.5
370.0	14.15	141.0	0.0271	65.41	91.62	1.569	0.1774	0.2489	958.6
380.0	14.54	145.0	0.0264	67.19	94.11	1.575	0.1774	0.2488	971.5
390.0	14.92	149.0	0.0257	68.96	96.60	1.582	0.1774	0.2488	984.3
400.0	15.31	153.0	0.0251	70.74	99.08	1.588	0.1774	0.2488	997.0
410.0	15.69	157.0	0.0245	72.51	101.6	1.594	0.1774	0.2487	1009.0
420.0	16.08	161.0	0.0239	74.29	104.1	1.600	0.1774	0.2487	1022.0
430.0	16.46	164.0	0.0233	76.07	106.5	1.606	0.1774	0.2487	1034.0
440.0	16.84	168.0	0.0228	77.84	109.0	1.612	0.1774	0.2487	1046.0
450.0	17.23	172.0	0.0223	79.62	111.5	1.617	0.1774	0.2486	1058.0
460.0	17.61	176.0	0.0218	81.39	114.0	1.623	0.1774	0.2486	1069.0
470.0	18.00	180.0	0.0213	83.17	116.5	1.628	0.1774	0.2486	1081.0
480.0	18.38	184.0	0.0209	84.94	119.0	1.633	0.1774	0.2486	1092.0
490.0	18.76	188.0	0.0204	86.72	121.5	1.638	0.1774	0.2486	1104.0
500.0	19.15	191.0	0.0200	88.49	124.0	1.643	0.1774	0.2486	1115.0
510.0	19.53	195.0	0.0196	90.27	126.4	1.648	0.1774	0.2486	1126.0
520.0	19.92	199.0	0.0193	92.04	128.9	1.653	0.1774	0.2486	1137.0
530.0	20.30	203.0	0.0189	93.82	131.4	1.658	0.1774	0.2486	1148.0
540.0	20.68	207.0	0.0185	95.59	133.9	1.663	0.1774	0.2486	1159.0
550.0	21.07	211.0	0.0182	97.37	136.4	1.667	0.1774	0.2486	1169.0
560.0	21.45	214.0	0.0179	99.14	138.9	1.672	0.1775	0.2486	1180.0
570.0	21.83	218.0	0.0176	100.9	141.4	1.676	0.1775	0.2486	1190.0
580.0	22.22	222.0	0.0173	102.7	143.8	1.680	0.1775	0.2486	1201.0
590.0	22.60	226.0	0.0170	104.5	146.3	1.685	0.1776	0.2487	1211.0
600.0	22.98	230.0	0.0167	106.2	148.8	1.689	0.1776	0.2487	1221.0
700.0	26.82	268.0	0.0143	124.0	173.7	1.727	0.1782	0.2493	1318.0
800.0	30.65	307.0	0.0125	141.9	198.7	1.761	0.1794	0.2504	1408.0
900.0	34.49	345.0	0.0111	159.9	223.8	1.790	0.1812	0.2522	1492.0
1000.0	38.32	383.0	0.0100	178.2	249.1	1.817	0.1835	0.2545	1569.0
1500.0	57.48	575.0	0.00667	273.6	380.1	1.923	0.1987	0.2696	1901.0
2000.0	76.63	766.0	0.00500	376.6	518.5	2.002	0.2125	0.2835	2176.0
2500.0	95.79	958.0	0.00400	485.5	662.9	2.067	0.2224	0.2934	2420.0
3000.0	114.9	1150.0	0.00333	598.5	811.4	2.121	0.2293	0.3002	2641.0
3500.0	134.1	1340.0	0.00286	714.4	962.7	2.167	0.2340	0.3050	2846.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

10 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$(\partial H/\partial V)_P$ BTU/LB	$(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.00	194.0	20.0	103000.0	0.00242	0.0940	19.7	0.00370	1.46531	3.56
120.0	53.34	187.0	17.5	87500.0	0.00257	0.0908	16.8	0.00354	1.45888	3.20
125.0	52.63	179.0	15.9	74800.0	0.00272	0.0877	14.6	0.00342	1.45217	2.91
130.0	51.90	170.0	14.8	64500.0	0.00284	0.0845	13.0	0.00332	1.44518	2.72
* 133.600	51.36	164.0	14.1	58200.0	0.00299	0.0822	12.2	0.00326	1.43997	2.62
* 133.600	0.2020	31.9	2.16	9.66	0.00826	0.00419	0.347	0.0786	1.00152	0.786
135.0	0.1997	32.3	2.16	9.67	0.00815	0.00423	0.350	0.0805	1.00150	0.784
140.0	0.1919	33.6	2.16	9.71	**0.00778**	0.00438	0.361	0.0874	1.00145	0.776
145.0	0.1847	34.9	2.17	9.74	**0.00744**	0.00453	0.373	0.0944	1.00139	0.770
150.0	0.1781	36.2	2.17	9.76	**0.00714**	0.00467	0.385	0.102	1.00134	0.765
155.0	0.1720	37.5	2.17	9.79	**0.00686**	0.00482	0.397	0.109	1.00130	0.761
160.0	0.1663	38.8	2.17	9.81	**0.00661**	0.00497	0.409	0.117	1.00125	0.758
165.0	0.1610	40.0	2.17	9.82	**0.00638**	0.00512	0.421	0.125	1.00121	0.755
170.0	0.1560	41.3	2.17	9.84	**0.00616**	0.00527	0.433	0.133	1.00118	0.753
175.0	0.1514	42.6	2.17	9.85	**0.00596**	0.00542	0.445	0.141	1.00114	0.751
180.0	0.1470	43.9	2.17	9.86	**0.00578**	0.00557	0.457	0.149	1.00111	0.749
185.0	0.1429	45.2	2.17	9.87	**0.00560**	0.00572	0.469	0.158	1.00108	0.748
190.0	0.1390	46.4	2.17	9.88	**0.00544**	0.00587	0.481	0.167	1.00105	0.746
200.0	0.1318	49.0	2.17	9.90	**0.00515**	0.00616	0.506	0.186	1.00099	0.744
205.0	0.1285	50.2	2.17	9.91	**0.00501**	0.00631	0.518	0.195	1.00097	0.743
210.0	0.1254	51.5	2.17	9.91	0.00488	0.00646	0.530	0.205	1.00094	0.743
215.0	0.1224	52.8	2.17	9.92	0.00476	0.00661	0.542	0.215	1.00092	0.742
220.0	0.1195	54.0	2.17	9.93	0.00465	0.00675	0.554	0.225	1.00090	0.741
225.0	0.1168	55.3	2.17	9.93	0.00454	0.00690	0.566	0.235	1.00088	0.740
230.0	0.1142	56.5	2.17	9.93	0.00443	0.00705	0.578	0.246	1.00086	0.740
235.0	0.1118	57.8	2.17	9.94	0.00433	0.00719	0.590	0.257	1.00084	0.739
240.0	0.1094	59.1	2.17	9.94	0.00424	0.00734	0.601	0.268	1.00082	0.739
245.0	0.1071	60.3	2.17	9.95	0.00415	0.00748	0.613	0.279	1.00081	0.738
250.0	0.1049	61.6	2.17	9.95	0.00406	0.00763	0.625	0.291	1.00079	0.738
255.0	0.1029	62.8	2.17	10.0	0.00398	0.00777	0.636	0.302	1.00077	0.737
260.0	0.1009	64.1	2.17	10.0	0.00390	0.00791	0.648	0.314	1.00076	0.737
265.0	0.09893	65.3	2.17	10.0	0.00382	0.00806	0.659	0.326	1.00075	0.736
270.0	0.09707	66.6	2.17	10.0	0.00375	0.00820	0.671	0.338	1.00073	0.736
275.0	0.09528	67.9	2.17	10.0	0.00368	0.00834	0.682	0.350	1.00072	0.735
280.0	0.09355	69.1	2.17	10.0	0.00361	0.00848	0.693	0.363	1.00070	0.735
285.0	0.09190	70.4	2.17	10.0	0.00355	0.00862	0.705	0.376	1.00069	0.735
290.0	0.09030	71.6	2.17	10.0	0.00348	0.00876	0.716	0.389	1.00068	0.734
295.0	0.08875	72.9	2.17	10.0	0.00342	0.00890	0.727	0.402	1.00067	0.734
300.0	0.08725	74.1	2.17	10.0	0.00336	0.00904	0.738	0.415	1.00066	0.733
310.0	0.08442	76.6	2.17	10.0	0.00325	0.00931	0.760	0.442	1.00064	0.733
320.0	0.08175	79.1	2.17	10.0	0.00315	0.00958	0.782	0.470	1.00062	0.732
330.0	0.07927	81.6	2.17	10.0	0.00305	0.00985	0.803	0.499	1.00060	0.731
340.0	0.07692	84.1	2.17	10.0	0.00296	0.0101	0.825	0.528	1.00058	0.731
350.0	0.07471	86.6	2.17	10.0	0.00287	0.0104	0.846	0.558	1.00056	0.730
360.0	0.07262	89.1	2.17	10.0	0.00279	0.0106	0.867	0.589	1.00055	0.730
370.0	0.07065	91.6	2.16	10.0	0.00272	0.0109	0.887	0.620	1.00053	0.729
380.0	0.06878	94.1	2.16	10.0	0.00264	0.0112	0.908	0.652	1.00052	0.729
390.0	0.06701	96.6	2.16	10.0	0.00258	0.0114	0.928	0.685	1.00050	0.728
400.0	0.06533	99.1	2.16	10.0	0.00251	0.0117	0.948	0.718	1.00049	0.728
410.0	0.06373	102.0	2.16	10.0	0.00245	0.0119	0.968	0.752	1.00048	0.727
420.0	0.06220	104.0	2.16	10.0	0.00239	0.0122	0.987	0.786	1.00047	0.727
430.0	0.06075	107.0	2.16	10.0	0.00233	0.0124	1.01	0.821	1.00046	0.726
440.0	0.05937	109.0	2.16	10.0	0.00228	0.0127	1.03	0.857	1.00045	0.726
450.0	0.05804	112.0	2.16	10.0	0.00223	0.0129	1.04	0.893	1.00044	0.725
460.0	0.05678	114.0	2.16	10.0	0.00218	0.0131	1.06	0.930	1.00043	0.725
470.0	0.05557	117.0	2.16	10.0	0.00213	0.0134	1.08	0.968	1.00042	0.725
480.0	0.05441	119.0	2.16	10.0	0.00208	0.0136	1.10	1.01	1.00041	0.724
490.0	0.05329	122.0	2.16	10.0	0.00205	0.0138	1.12	1.04	1.00040	0.724
500.0	0.05222	124.0	2.16	10.0	0.00200	0.0141	1.14	1.08	1.00039	0.724
510.0	0.05120	127.0	2.16	10.0	0.00196	0.0143	1.16	1.12	1.00039	0.723
520.0	0.05021	129.0	2.16	10.0	0.00193	0.0145	1.17	1.16	1.00038	0.723
530.0	0.04925	132.0	2.16	10.0	0.00189	0.0147	1.19	1.20	1.00037	0.723
540.0	0.04835	134.0	2.16	10.0	0.00186	0.0150	1.21	1.25	1.00036	0.722
550.0	0.04747	137.0	2.16	10.0	0.00182	0.0152	1.23	1.29	1.00036	0.722
560.0	0.04662	139.0	2.16	10.0	0.00179	0.0154	1.24	1.33	1.00035	0.722
570.0	0.04580	142.0	2.16	10.0	0.00176	0.0156	1.26	1.37	1.00034	0.721
580.0	0.04501	144.0	2.16	10.0	0.00173	0.0159	1.28	1.42	1.00034	0.721
590.0	0.04424	147.0	2.16	10.0	0.00170	0.0161	1.29	1.46	1.00033	0.721
600.0	0.04351	149.0	2.16	10.0	0.00167	0.0163	1.31	1.50	1.00033	0.720
700.0	0.03723	174.0	2.15	10.0	0.00143	0.0184	1.47	1.98	1.00028	0.718
800.0	0.03262	200.0	2.14	10.0	0.00125	0.0204	1.62	2.49	1.00025	0.716
900.0	0.02900	227.0	2.12	10.0	0.00111	0.0223	1.76	3.05	1.00022	0.714
1000.0	0.02610	254.0	2.09	10.0	0.00100	0.0243	1.89	3.65	1.00020	0.713
1500.0	0.01740	405.0	1.93	10.0	0.000667					
2000.0	0.01305	567.0	1.80	10.0	0.000500					
2500.0	0.01044	734.0	1.72	10.0	0.000400					
3000.0	0.008700	901.0	1.67	10.0	0.000333					
3500.0	0.007458	1070.0	1.64	10.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

14.696 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01852	1910.0	250.0	-64.07	-64.02	0.5856	0.2321	0.4706	4239.0
120.0	0.01875	1640.0	225.0	-61.68	-61.63	0.6059	0.2410	0.4814	3897.0
125.0	0.01900	1420.0	204.0	-59.26	-59.21	0.6256	0.2434	0.4870	3631.0
130.0	0.01927	1240.0	186.0	-56.82	-56.77	0.6448	0.2424	0.4899	3412.0
135.0	0.01955	1090.0	170.0	-54.37	-54.31	0.6633	0.2399	0.4917	3224.0
* 139.200	0.01981	987.0	158.0	-52.29	-52.23	0.6785	0.2374	0.4931	3081.0
* 139.200	3.473	48.7	0.115	23.77	33.22	1.293	0.1842	0.2683	573.6
140.0	3.495	49.1	0.114	23.92	33.43	1.294	0.1840	0.2679	575.5
145.0	3.636	51.3	0.109	24.86	34.76	1.304	0.1831	0.2654	587.2
150.0	3.776	53.5	0.105	25.81	36.08	1.313	0.1823	0.2634	598.6
155.0	3.915	55.7	0.101	26.74	37.39	1.321	0.1816	0.2616	609.7
160.0	4.053	57.8	0.0969	27.67	38.70	1.330	0.1811	0.2602	620.5
165.0	4.190	60.0	0.0936	28.59	40.00	1.338	0.1806	0.2589	631.1
170.0	4.327	62.1	0.0904	29.51	41.29	1.345	0.1802	0.2579	641.4
175.0	4.463	64.1	0.0875	30.43	42.58	1.353	0.1799	0.2570	651.5
180.0	4.599	66.2	0.0848	31.34	43.86	1.360	0.1796	0.2562	661.5
185.0	4.734	68.3	0.0823	32.25	45.14	1.367	0.1794	0.2555	671.2
190.0	4.869	70.3	0.0799	33.16	46.41	1.374	0.1792	0.2549	680.8
200.0	5.137	74.4	0.0756	34.97	48.96	1.387	0.1788	0.2538	699.5
205.0	5.271	76.4	0.0736	35.88	50.22	1.393	0.1787	0.2534	708.6
210.0	5.405	78.4	0.0717	36.78	51.49	1.399	0.1785	0.2530	717.6
215.0	5.539	80.4	0.0699	37.68	52.75	1.405	0.1784	0.2527	726.5
220.0	5.672	82.4	0.0682	38.58	54.02	1.411	0.1783	0.2524	735.2
225.0	5.805	84.4	0.0666	39.48	55.28	1.417	0.1782	0.2521	743.8
230.0	5.938	86.4	0.0651	40.38	56.54	1.422	0.1782	0.2519	752.3
235.0	6.071	88.4	0.0637	41.28	57.80	1.428	0.1781	0.2516	760.7
240.0	6.203	90.4	0.0623	42.17	59.05	1.433	0.1780	0.2514	769.1
245.0	6.336	92.4	0.0610	43.07	60.31	1.438	0.1780	0.2512	777.3
250.0	6.468	94.3	0.0597	43.97	61.57	1.443	0.1779	0.2511	785.4
255.0	6.600	96.3	0.0585	44.86	62.82	1.448	0.1779	0.2509	793.4
260.0	6.733	98.3	0.0573	45.75	64.08	1.453	0.1778	0.2508	801.3
265.0	6.865	100.0	0.0562	46.65	65.33	1.458	0.1778	0.2506	809.2
270.0	6.997	102.0	0.0551	47.54	66.58	1.462	0.1778	0.2505	816.9
275.0	7.129	104.0	0.0541	48.44	67.84	1.467	0.1777	0.2504	824.6
280.0	7.261	106.0	0.0531	49.33	69.09	1.472	0.1777	0.2503	832.2
285.0	7.392	108.0	0.0521	50.22	70.34	1.476	0.1777	0.2502	839.8
290.0	7.524	110.0	0.0512	51.11	71.59	1.480	0.1777	0.2501	847.2
295.0	7.656	112.0	0.0503	52.00	72.84	1.485	0.1776	0.2500	854.6
300.0	7.787	114.0	0.0495	52.90	74.09	1.489	0.1776	0.2499	862.0
310.0	8.050	118.0	0.0478	54.68	76.59	1.497	0.1776	0.2498	876.4
320.0	8.313	122.0	0.0463	56.46	79.08	1.505	0.1776	0.2497	890.7
330.0	8.576	126.0	0.0449	58.24	81.58	1.513	0.1775	0.2495	904.6
340.0	8.839	130.0	0.0435	60.02	84.08	1.520	0.1775	0.2494	918.4
350.0	9.101	133.0	0.0423	61.80	86.57	1.527	0.1775	0.2494	932.0
360.0	9.363	137.0	0.0411	63.58	89.06	1.534	0.1775	0.2493	945.3
370.0	9.626	141.0	0.0399	65.36	91.56	1.541	0.1774	0.2492	958.5
380.0	9.888	145.0	0.0389	67.14	94.05	1.548	0.1774	0.2491	971.4
390.0	10.15	149.0	0.0379	68.92	96.54	1.554	0.1774	0.2491	984.2
400.0	10.41	153.0	0.0369	70.69	99.03	1.561	0.1774	0.2490	997.0
410.0	10.67	157.0	0.0360	72.47	101.5	1.567	0.1774	0.2490	1009.0
420.0	10.94	161.0	0.0351	74.25	104.0	1.573	0.1774	0.2489	1022.0
430.0	11.20	164.0	0.0343	76.03	106.5	1.579	0.1774	0.2489	1034.0
440.0	11.46	168.0	0.0335	77.80	109.0	1.584	0.1774	0.2489	1046.0
450.0	11.72	172.0	0.0328	79.58	111.5	1.590	0.1774	0.2488	1058.0
460.0	11.98	176.0	0.0321	81.36	114.0	1.595	0.1774	0.2488	1069.0
470.0	12.24	180.0	0.0314	83.13	116.5	1.601	0.1774	0.2488	1081.0
480.0	12.51	184.0	0.0307	84.91	118.9	1.606	0.1774	0.2488	1092.0
490.0	12.77	188.0	0.0301	86.68	121.4	1.611	0.1774	0.2487	1104.0
500.0	13.03	191.0	0.0295	88.46	123.9	1.616	0.1774	0.2487	1115.0
510.0	13.29	195.0	0.0289	90.24	126.4	1.621	0.1774	0.2487	1126.0
520.0	13.55	199.0	0.0283	92.01	128.9	1.626	0.1774	0.2487	1137.0
530.0	13.81	203.0	0.0278	93.79	131.4	1.631	0.1774	0.2487	1148.0
540.0	14.07	207.0	0.0273	95.56	133.9	1.635	0.1774	0.2487	1159.0
550.0	14.33	211.0	0.0268	97.34	136.3	1.640	0.1775	0.2487	1170.0
560.0	14.60	214.0	0.0263	99.12	138.8	1.644	0.1775	0.2487	1180.0
570.0	14.86	218.0	0.0258	100.9	141.3	1.649	0.1775	0.2487	1191.0
580.0	15.12	222.0	0.0254	102.7	143.8	1.653	0.1775	0.2488	1201.0
590.0	15.38	226.0	0.0250	104.4	146.3	1.657	0.1776	0.2488	1211.0
600.0	15.64	230.0	0.0245	106.2	148.8	1.661	0.1776	0.2488	1221.0
700.0	18.25	268.0	0.0210	124.0	173.7	1.700	0.1782	0.2493	1319.0
800.0	20.86	307.0	0.0184	141.9	198.7	1.733	0.1794	0.2505	1408.0
900.0	23.47	345.0	0.0163	159.9	223.8	1.763	0.1812	0.2522	1492.0
1000.0	26.08	383.0	0.0147	178.2	249.1	1.789	0.1835	0.2545	1570.0
1500.0	39.11	575.0	0.00980	273.6	380.1	1.895	0.1987	0.2697	1902.0
2000.0	52.15	767.0	0.00735	376.6	513.5	1.975	0.2125	0.2835	2177.0
2500.0	65.18	958.0	0.00588	485.5	662.9	2.039	0.2224	0.2934	2420.0
3000.0	78.22	1150.0	0.00490	598.5	811.4	2.094	0.2293	0.3002	2641.0
3500.0	91.25	1340.0	0.00420	714.4	962.7	2.140	0.2340	0.3050	2846.0

* TWO-PHASE BOUNDARY

14.696 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DU)$_V$ PSIA-CU FT/BTU	-V(DP/DV)$_T$ PSIA	(DV/DT)$_P$/V 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.01	194.0	19.9	103000.0	0.00242	0.0940	19.8	0.00370	1.46533	3.56
120.0	53.34	187.0	17.5	87500.0	0.00257	0.0909	16.8	0.00354	1.45891	3.20
125.0	52.64	179.0	15.9	74900.0	0.00272	0.0877	14.6	0.00342	1.45220	2.92
130.0	51.91	170.0	14.7	64500.0	0.00286	0.0845	13.0	0.00332	1.44521	2.72
135.0	51.15	162.0	13.8	56000.0	0.00303	0.0814	11.9	0.00324	1.43796	2.59
* 139.200	50.48	156.0	13.2	49800.0	0.00317	0.0787	11.0	0.00316	1.43163	2.49
* 139.200	0.2879	32.8	2.17	14.0	0.00818	0.00439	0.362	0.0569	1.00217	0.796
140.0	0.2861	33.0	2.17	14.0	0.00812	0.00442	0.364	0.0576	1.00216	0.794
145.0	0.2750	34.3	2.17	14.1	0.00773	0.00456	0.375	0.0625	1.00207	0.786
150.0	0.2648	35.7	2.17	14.2	0.00738	0.00471	0.387	0.0675	1.00200	0.779
155.0	0.2554	37.0	2.17	14.2	0.00707	0.00486	0.399	0.0727	1.00192	0.773
160.0	0.2467	38.3	2.17	14.3	0.00679	0.00501	0.411	0.0780	1.00186	0.768
165.0	0.2386	39.6	2.17	14.3	0.00654	0.00515	0.423	0.0834	1.00180	0.764
170.0	0.2311	40.9	2.17	14.3	0.00630	0.00530	0.435	0.0890	1.00174	0.761
175.0	0.2241	42.2	2.17	14.4	0.00609	0.00545	0.447	0.0947	1.00169	0.758
180.0	0.2174	43.5	2.17	14.4	0.00589	0.00560	0.459	0.101	1.00164	0.756
185.0	0.2112	44.8	2.17	14.4	0.00570	0.00575	0.471	0.106	1.00159	0.754
190.0	0.2054	46.1	2.17	14.4	0.00553	0.00590	0.483	0.113	1.00155	0.752
200.0	0.1946	48.6	2.17	14.5	0.00522	0.00619	0.507	0.125	1.00147	0.749
205.0	0.1897	49.9	2.17	14.5	0.00508	0.00634	0.519	0.132	1.00143	0.747
210.0	0.1850	51.2	2.17	14.5	0.00494	0.00649	0.531	0.139	1.00139	0.746
215.0	0.1806	52.5	2.17	14.5	0.00482	0.00663	0.543	0.145	1.00136	0.745
220.0	0.1763	53.7	2.17	14.5	0.00470	0.00678	0.555	0.152	1.00133	0.744
225.0	0.1723	55.0	2.17	14.5	0.00458	0.00693	0.567	0.159	1.00130	0.743
230.0	0.1684	56.3	2.17	14.6	0.00447	0.00707	0.579	0.167	1.00127	0.743
235.0	0.1647	57.6	2.17	14.6	0.00437	0.00722	0.591	0.174	1.00124	0.742
240.0	0.1612	58.8	2.17	14.6	0.00427	0.00736	0.603	0.182	1.00121	0.741
245.0	0.1578	60.1	2.17	14.6	0.00418	0.00750	0.614	0.189	1.00119	0.740
250.0	0.1546	61.4	2.17	14.6	0.00409	0.00765	0.626	0.197	1.00116	0.740
255.0	0.1515	62.6	2.17	14.6	0.00401	0.00779	0.638	0.205	1.00114	0.739
260.0	0.1485	63.9	2.17	14.6	0.00393	0.00793	0.649	0.213	1.00112	0.739
265.0	0.1457	65.1	2.17	14.6	0.00385	0.00808	0.661	0.221	1.00110	0.738
270.0	0.1429	66.4	2.17	14.6	0.00377	0.00822	0.672	0.229	1.00108	0.737
275.0	0.1403	67.7	2.17	14.6	0.00370	0.00836	0.683	0.238	1.00106	0.737
280.0	0.1377	68.9	2.17	14.6	0.00363	0.00850	0.695	0.247	1.00104	0.736
285.0	0.1353	70.2	2.17	14.6	0.00356	0.00864	0.706	0.255	1.00102	0.736
290.0	0.1329	71.4	2.17	14.6	0.00350	0.00878	0.717	0.264	1.00100	0.736
295.0	0.1306	72.7	2.17	14.6	0.00344	0.00891	0.728	0.273	1.00098	0.735
300.0	0.1284	74.0	2.17	14.6	0.00338	0.00905	0.739	0.282	1.00097	0.735
310.0	0.1242	76.5	2.17	14.6	0.00327	0.00933	0.761	0.301	1.00094	0.734
320.0	0.1203	79.0	2.17	14.6	0.00316	0.00960	0.783	0.320	1.00091	0.733
330.0	0.1166	81.5	2.17	14.7	0.00306	0.00987	0.804	0.339	1.00088	0.732
340.0	0.1131	84.0	2.17	14.7	0.00297	0.0101	0.826	0.359	1.00085	0.732
350.0	0.1099	86.5	2.17	14.7	0.00288	0.0104	0.847	0.379	1.00083	0.731
360.0	0.1068	89.0	2.17	14.7	0.00280	0.0107	0.867	0.400	1.00080	0.730
370.0	0.1039	91.5	2.17	14.7	0.00272	0.0109	0.888	0.422	1.00078	0.730
380.0	0.1011	94.0	2.17	14.7	0.00265	0.0112	0.908	0.443	1.00076	0.729
390.0	0.09852	96.5	2.17	14.7	0.00258	0.0114	0.929	0.466	1.00074	0.729
400.0	0.09605	99.0	2.17	14.7	0.00252	0.0117	0.949	0.488	1.00072	0.728
410.0	0.09369	101.0	2.17	14.7	0.00245	0.0119	0.968	0.511	1.00071	0.728
420.0	0.09145	104.0	2.17	14.7	0.00239	0.0122	0.988	0.535	1.00069	0.727
430.0	0.08931	106.0	2.17	14.7	0.00234	0.0124	1.01	0.559	1.00067	0.727
440.0	0.08727	109.0	2.17	14.7	0.00228	0.0127	1.03	0.583	1.00066	0.726
450.0	0.08532	111.0	2.17	14.7	0.00223	0.0129	1.05	0.608	1.00064	0.726
460.0	0.08346	114.0	2.17	14.7	0.00218	0.0131	1.06	0.633	1.00063	0.725
470.0	0.08168	116.0	2.17	14.7	0.00214	0.0134	1.08	0.658	1.00062	0.725
480.0	0.07997	119.0	2.17	14.7	0.00209	0.0136	1.10	0.684	1.00060	0.725
490.0	0.07833	121.0	2.16	14.7	0.00205	0.0138	1.12	0.711	1.00059	0.724
500.0	0.07675	124.0	2.16	14.7	0.00201	0.0141	1.14	0.737	1.00058	0.724
510.0	0.07525	126.0	2.16	14.7	0.00197	0.0143	1.16	0.764	1.00057	0.723
520.0	0.07380	129.0	2.16	14.7	0.00193	0.0145	1.17	0.792	1.00056	0.723
530.0	0.07240	131.0	2.16	14.7	0.00189	0.0148	1.19	0.820	1.00055	0.723
540.0	0.07105	134.0	2.16	14.7	0.00186	0.0150	1.21	0.848	1.00054	0.722
550.0	0.06975	136.0	2.16	14.7	0.00182	0.0152	1.23	0.876	1.00053	0.722
560.0	0.06851	139.0	2.16	14.7	0.00179	0.0154	1.24	0.905	1.00052	0.722
570.0	0.06731	141.0	2.16	14.7	0.00176	0.0156	1.26	0.934	1.00051	0.721
580.0	0.06615	144.0	2.16	14.7	0.00173	0.0159	1.28	0.964	1.00050	0.721
590.0	0.06502	147.0	2.16	14.7	0.00170	0.0161	1.29	0.994	1.00049	0.721
600.0	0.06394	149.0	2.16	14.7	0.00167	0.0163	1.31	1.02	1.00048	0.721
700.0	0.05479	174.0	2.15	14.7	0.00143	0.0184	1.47	1.35	1.00041	0.718
800.0	0.04794	200.0	2.14	14.7	0.00125	0.0204	1.62	1.70	1.00036	0.716
900.0	0.04261	227.0	2.12	14.7	0.00111	0.0223	1.76	2.08	1.00032	0.714
1000.0	0.03835	254.0	2.09	14.7	0.00100	0.0243	1.83	2.49	1.00029	0.713
1500.0	0.02557	405.0	1.93	14.7	0.000667					
2000.0	0.01918	567.0	1.80	14.7	0.000500					
2500.0	0.01534	734.0	1.72	14.7	0.000400					
3000.0	0.01278	901.0	1.67	14.7	0.000333					
3500.0	0.01095	1070.0	1.64	14.7	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

15 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01852	1910.0	250.0	-64.07	-64.02	0.5856	0.2322	0.4706	4239.0
120.0	0.01875	1640.0	225.0	-61.69	-61.63	0.6059	0.2410	0.4814	3897.0
125.0	0.01900	1420.0	204.0	-59.26	-59.21	0.6256	0.2434	0.4870	3631.0
130.0	0.01927	1240.0	186.0	-56.82	-56.77	0.6448	0.2424	0.4899	3412.0
135.0	0.01955	1090.0	170.0	-54.37	-54.31	0.6633	0.2399	0.4917	3224.0
* 139.500	0.01983	979.0	157.0	-52.13	-52.08	0.6796	0.2372	0.4932	3071.0
* 139.500	3.408	48.8	0.117	23.81	33.28	1.292	0.1843	0.2686	574.0
140.0	3.421	49.0	0.117	23.90	33.40	1.293	0.1842	0.2684	575.1
145.0	3.559	51.2	0.112	24.85	34.73	1.302	0.1832	0.2658	586.9
150.0	3.697	53.4	0.107	25.79	36.06	1.311	0.1824	0.2637	598.3
155.0	3.833	55.6	0.103	26.73	37.37	1.320	0.1817	0.2620	609.4
160.0	3.968	57.8	0.0991	27.66	38.68	1.328	0.1812	0.2605	620.3
165.0	4.103	59.9	0.0956	28.58	39.98	1.336	0.1807	0.2592	630.9
170.0	4.237	62.0	0.0924	29.50	41.27	1.344	0.1803	0.2581	641.2
175.0	4.371	64.1	0.0894	30.42	42.56	1.351	0.1800	0.2572	651.4
180.0	4.504	66.2	0.0866	31.33	43.84	1.358	0.1797	0.2563	661.3
185.0	4.636	68.2	0.0840	32.24	45.12	1.365	0.1794	0.2556	671.1
190.0	4.768	70.3	0.0816	33.15	46.40	1.372	0.1792	0.2550	680.7
200.0	5.032	74.3	0.0772	34.97	48.94	1.385	0.1788	0.2540	699.4
205.0	5.163	76.4	0.0751	35.87	50.21	1.392	0.1787	0.2535	708.5
210.0	5.294	78.4	0.0732	36.77	51.48	1.398	0.1786	0.2531	717.5
215.0	5.425	80.4	0.0714	37.67	52.74	1.404	0.1785	0.2528	726.4
220.0	5.556	82.4	0.0697	38.58	54.01	1.409	0.1784	0.2525	735.1
225.0	5.686	84.4	0.0681	39.47	55.27	1.415	0.1783	0.2522	743.7
230.0	5.816	86.4	0.0665	40.37	56.53	1.421	0.1782	0.2519	752.3
235.0	5.946	88.4	0.0650	41.27	57.79	1.426	0.1781	0.2517	760.7
240.0	6.076	90.4	0.0636	42.17	59.05	1.431	0.1781	0.2515	769.0
245.0	6.206	92.3	0.0622	43.06	60.30	1.437	0.1780	0.2513	777.2
250.0	6.336	94.3	0.0609	43.96	61.56	1.442	0.1779	0.2511	785.3
255.0	6.466	96.3	0.0597	44.85	62.81	1.447	0.1779	0.2510	793.3
260.0	6.595	98.3	0.0585	45.75	64.07	1.452	0.1779	0.2508	801.3
265.0	6.725	100.0	0.0574	46.64	65.32	1.456	0.1778	0.2507	809.1
270.0	6.854	102.0	0.0563	47.54	66.58	1.461	0.1778	0.2506	816.9
275.0	6.983	104.0	0.0552	48.43	67.83	1.466	0.1777	0.2504	824.6
280.0	7.113	106.0	0.0542	49.32	69.08	1.470	0.1777	0.2503	832.2
285.0	7.242	108.0	0.0532	50.22	70.33	1.475	0.1777	0.2502	839.7
290.0	7.371	110.0	0.0523	51.11	71.58	1.479	0.1777	0.2501	847.2
295.0	7.500	112.0	0.0514	52.00	72.83	1.483	0.1776	0.2500	854.6
300.0	7.629	114.0	0.0505	52.89	74.08	1.487	0.1776	0.2500	861.9
310.0	7.887	118.0	0.0488	54.67	76.58	1.496	0.1776	0.2498	876.4
320.0	8.144	122.0	0.0473	56.46	79.08	1.503	0.1776	0.2497	890.6
330.0	8.402	126.0	0.0458	58.24	81.58	1.511	0.1775	0.2496	904.6
340.0	8.659	130.0	0.0444	60.02	84.07	1.519	0.1775	0.2495	918.4
350.0	8.916	133.0	0.0431	61.80	86.56	1.526	0.1775	0.2494	931.9
360.0	9.173	137.0	0.0419	63.58	89.06	1.533	0.1775	0.2493	945.3
370.0	9.430	141.0	0.0408	65.36	91.55	1.540	0.1775	0.2492	958.4
380.0	9.687	145.0	0.0397	67.14	94.04	1.546	0.1774	0.2492	971.4
390.0	9.944	149.0	0.0387	68.91	96.53	1.553	0.1774	0.2491	984.2
400.0	10.20	153.0	0.0377	70.69	99.03	1.559	0.1774	0.2490	997.0
410.0	10.46	157.0	0.0368	72.47	101.5	1.565	0.1774	0.2490	1009.0
420.0	10.71	161.0	0.0359	74.25	104.0	1.571	0.1774	0.2490	1022.0
430.0	10.97	164.0	0.0350	76.02	106.5	1.577	0.1774	0.2489	1034.0
440.0	11.23	168.0	0.0342	77.80	109.0	1.583	0.1774	0.2489	1046.0
450.0	11.48	172.0	0.0335	79.58	111.5	1.588	0.1774	0.2488	1058.0
460.0	11.74	176.0	0.0327	81.35	114.0	1.594	0.1774	0.2488	1069.0
470.0	12.00	180.0	0.0320	83.13	116.4	1.599	0.1774	0.2488	1081.0
480.0	12.25	184.0	0.0313	84.91	118.9	1.604	0.1774	0.2488	1092.0
490.0	12.51	188.0	0.0307	86.68	121.4	1.610	0.1774	0.2488	1104.0
500.0	12.76	191.0	0.0301	88.46	123.9	1.615	0.1774	0.2487	1115.0
510.0	13.02	195.0	0.0295	90.23	126.4	1.620	0.1774	0.2487	1126.0
520.0	13.28	199.0	0.0289	92.01	128.9	1.624	0.1774	0.2487	1137.0
530.0	13.53	203.0	0.0284	93.79	131.4	1.629	0.1774	0.2487	1148.0
540.0	13.79	207.0	0.0278	95.56	133.9	1.634	0.1774	0.2487	1159.0
550.0	14.04	211.0	0.0273	97.34	136.3	1.638	0.1775	0.2487	1170.0
560.0	14.30	214.0	0.0268	99.11	138.8	1.643	0.1775	0.2487	1180.0
570.0	14.56	218.0	0.0264	100.9	141.3	1.647	0.1775	0.2487	1191.0
580.0	14.81	222.0	0.0259	102.7	143.8	1.652	0.1775	0.2488	1201.0
590.0	15.07	226.0	0.0255	104.4	146.3	1.656	0.1776	0.2488	1211.0
600.0	15.32	230.0	0.0250	106.2	148.8	1.660	0.1776	0.2488	1221.0
700.0	17.88	268.0	0.0215	124.0	173.7	1.698	0.1782	0.2493	1319.0
800.0	20.44	307.0	0.0188	141.9	198.7	1.732	0.1794	0.2505	1408.0
900.0	22.99	345.0	0.0167	159.9	223.8	1.761	0.1812	0.2522	1492.0
1000.0	25.55	383.0	0.0150	178.2	249.1	1.788	0.1835	0.2545	1570.0
1500.0	38.32	575.0	0.0100	273.6	380.1	1.894	0.1987	0.2697	1902.0
2000.0	51.09	767.0	0.00750	376.6	518.5	1.974	0.2125	0.2835	2177.0
2500.0	63.86	958.0	0.00600	485.5	662.9	2.038	0.2224	0.2934	2420.0
3000.0	76.63	1150.0	0.00500	598.5	811.4	2.092	0.2293	0.3002	2641.0
3500.0	89.40	1340.0	0.00429	714.4	962.7	2.139	0.2340	0.3050	2846.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

15 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.01	195.0	19.9	103000.0	0.00242	0.0940	19.8	0.00370	1.46533	3.56
120.0	53.34	187.0	17.5	87500.0	0.00257	0.0909	16.8	0.00354	1.45891	3.20
125.0	52.64	179.0	15.3	74900.0	0.00272	0.0877	14.6	0.00342	1.45220	2.92
130.0	51.91	170.0	14.7	64600.0	0.00288	0.0845	13.0	0.00332	1.44522	2.72
135.0	51.15	162.0	13.8	56000.0	0.00303	0.0814	11.9	0.00324	1.43796	2.59
* 139.500	50.43	155.0	13.1	49400.0	0.00318	0.0785	11.0	0.00316	1.43116	2.48
* 139.500	0.2934	32.8	2.17	14.3	0.00818	0.00441	0.363	0.0559	1.00221	0.797
140.0	0.2923	33.0	2.17	14.3	0.00814	0.00442	0.364	0.0563	1.00220	0.796
145.0	0.2810	34.3	2.17	14.4	0.00775	0.00457	0.375	0.0611	1.00212	0.787
150.0	0.2715	35.6	2.17	14.5	0.00740	0.00471	0.387	0.0661	1.00204	0.780
155.0	0.2609	37.0	2.17	14.5	0.00703	0.00486	0.399	0.0711	1.00197	0.774
160.0	0.2520	38.3	2.17	14.6	0.00681	0.00501	0.411	0.0763	1.00190	0.769
165.0	0.2437	39.6	2.17	14.6	0.00655	0.00516	0.423	0.0816	1.00184	0.765
170.0	0.2360	40.9	2.17	14.6	0.00631	0.00530	0.435	0.0871	1.00178	0.762
175.0	0.2288	42.2	2.17	14.7	0.00610	0.00545	0.447	0.0927	1.00172	0.759
180.0	0.2220	43.5	2.17	14.7	0.00590	0.00560	0.459	0.0984	1.00167	0.756
185.0	0.2157	44.6	2.17	14.7	0.00571	0.00575	0.471	0.104	1.00162	0.754
190.0	0.2097	46.1	2.17	14.7	0.00554	0.00590	0.483	0.110	1.00158	0.752
200.0	0.1987	48.6	2.17	14.8	0.00522	0.00619	0.507	0.123	1.00150	0.749
205.0	0.1937	49.9	2.17	14.8	0.00508	0.00634	0.519	0.129	1.00146	0.748
210.0	0.1889	51.2	2.17	14.8	0.00495	0.00649	0.531	0.136	1.00142	0.747
215.0	0.1843	52.5	2.17	14.8	0.00482	0.00663	0.543	0.142	1.00139	0.745
220.0	0.1800	53.7	2.17	14.8	0.00470	0.00678	0.555	0.149	1.00136	0.744
225.0	0.1759	55.0	2.17	14.8	0.00459	0.00693	0.567	0.156	1.00132	0.744
230.0	0.1719	56.3	2.17	14.9	0.00448	0.00707	0.579	0.163	1.00130	0.743
235.0	0.1682	57.5	2.17	14.9	0.00437	0.00722	0.591	0.171	1.00127	0.742
240.0	0.1646	58.8	2.17	14.9	0.00426	0.00736	0.603	0.178	1.00124	0.741
245.0	0.1611	60.1	2.17	14.9	0.00418	0.00751	0.614	0.185	1.00121	0.740
250.0	0.1578	61.3	2.17	14.9	0.00409	0.00765	0.626	0.193	1.00119	0.740
255.0	0.1547	62.6	2.17	14.9	0.00401	0.00779	0.638	0.201	1.00116	0.739
260.0	0.1516	63.9	2.17	14.9	0.00393	0.00793	0.649	0.209	1.00114	0.739
265.0	0.1487	65.1	2.17	14.9	0.00385	0.00808	0.661	0.217	1.00112	0.738
270.0	0.1459	66.4	2.17	14.9	0.00377	0.00822	0.672	0.225	1.00110	0.738
275.0	0.1432	67.7	2.17	14.9	0.00370	0.00836	0.683	0.233	1.00108	0.737
280.0	0.1406	68.9	2.17	14.9	0.00363	0.00850	0.695	0.241	1.00106	0.737
285.0	0.1381	70.2	2.17	14.9	0.00357	0.00864	0.706	0.250	1.00104	0.736
290.0	0.1357	71.4	2.17	14.9	0.00350	0.00878	0.717	0.259	1.00102	0.736
295.0	0.1333	72.7	2.17	14.9	0.00344	0.00892	0.728	0.267	1.00100	0.735
300.0	0.1311	73.9	2.17	14.9	0.00338	0.00905	0.739	0.276	1.00099	0.735
310.0	0.1268	76.5	2.17	14.9	0.00327	0.00933	0.761	0.294	1.00095	0.734
320.0	0.1228	79.0	2.17	14.9	0.00316	0.00960	0.783	0.313	1.00092	0.733
330.0	0.1190	81.5	2.17	15.0	0.00306	0.00987	0.804	0.332	1.00090	0.732
340.0	0.1155	84.0	2.17	15.0	0.00297	0.0101	0.826	0.352	1.00087	0.732
350.0	0.1122	86.5	2.17	15.0	0.00288	0.0104	0.847	0.372	1.00084	0.731
360.0	0.1090	89.0	2.17	15.0	0.00280	0.0107	0.867	0.392	1.00082	0.730
370.0	0.1060	91.5	2.17	15.0	0.00272	0.0109	0.888	0.413	1.00080	0.730
380.0	0.1032	94.0	2.17	15.0	0.00265	0.0112	0.908	0.434	1.00078	0.729
390.0	0.1006	96.5	2.17	15.0	0.00259	0.0114	0.929	0.456	1.00076	0.729
400.0	0.09804	99.0	2.17	15.0	0.00252	0.0117	0.949	0.478	1.00074	0.728
410.0	0.09563	101.0	2.17	15.0	0.00245	0.0119	0.968	0.501	1.00072	0.728
420.0	0.09334	104.0	2.17	15.0	0.00239	0.0122	0.988	0.524	1.00070	0.727
430.0	0.09115	106.0	2.17	15.0	0.00234	0.0124	1.01	0.547	1.00069	0.727
440.0	0.08908	109.0	2.17	15.0	0.00228	0.0127	1.03	0.571	1.00067	0.726
450.0	0.08709	111.0	2.17	15.0	0.00223	0.0129	1.05	0.595	1.00066	0.726
460.0	0.08519	114.0	2.17	15.0	0.00218	0.0131	1.06	0.620	1.00064	0.725
470.0	0.08337	116.0	2.17	15.0	0.00214	0.0134	1.08	0.645	1.00063	0.725
480.0	0.08162	119.0	2.17	15.0	0.00209	0.0136	1.10	0.670	1.00061	0.725
490.0	0.07995	121.0	2.16	15.0	0.00205	0.0138	1.12	0.696	1.00060	0.724
500.0	0.07835	124.0	2.16	15.0	0.00201	0.0141	1.14	0.722	1.00059	0.724
510.0	0.07681	126.0	2.16	15.0	0.00197	0.0143	1.16	0.749	1.00058	0.723
520.0	0.07532	129.0	2.16	15.0	0.00193	0.0145	1.17	0.776	1.00057	0.723
530.0	0.07390	131.0	2.16	15.0	0.00189	0.0148	1.19	0.803	1.00056	0.723
540.0	0.07253	134.0	2.16	15.0	0.00186	0.0150	1.21	0.830	1.00055	0.722
550.0	0.07120	136.0	2.16	15.0	0.00182	0.0152	1.23	0.858	1.00054	0.722
560.0	0.06993	139.0	2.16	15.0	0.00179	0.0154	1.24	0.887	1.00053	0.722
570.0	0.06870	141.0	2.16	15.0	0.00176	0.0156	1.26	0.915	1.00052	0.721
580.0	0.06751	144.0	2.16	15.0	0.00173	0.0159	1.28	0.944	1.00051	0.721
590.0	0.06637	146.0	2.16	15.0	0.00170	0.0161	1.29	0.974	1.00050	0.721
600.0	0.06525	149.0	2.16	15.0	0.00167	0.0163	1.31	1.00	1.00049	0.721
700.0	0.05592	174.0	2.15	15.0	0.00143	0.0184	1.47	1.32	1.00042	0.718
800.0	0.04893	200.0	2.14	15.0	0.00125	0.0204	1.62	1.66	1.00037	0.716
900.0	0.04349	227.0	2.12	15.0	0.00111	0.0223	1.76	2.04	1.00033	0.714
1000.0	0.03914	254.0	2.09	15.0	0.00100	0.0243	1.89	2.44	1.00029	0.713
1500.0	0.02603	405.0	1.93	15.0	0.000667					
2000.0	0.01957	567.0	1.80	15.0	0.000500					
2500.0	0.01566	734.0	1.72	15.0	0.000400					
3000.0	0.01305	901.0	1.67	15.0	0.000333					
3500.0	0.01119	1070.0	1.64	15.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

20 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01852	1910.0	250.0	-64.07	-64.00	0.5855	0.2323	0.4705	4238.0
120.0	0.01875	1640.0	225.0	-61.69	-61.62	0.6058	0.2412	0.4813	3896.0
125.0	0.01900	1420.0	204.0	-59.27	-59.20	0.6256	0.2435	0.4869	3631.0
130.0	0.01925	1240.0	186.0	-56.83	-56.76	0.6447	0.2426	0.4898	3412.0
135.0	0.01955	1100.0	170.0	-54.37	-54.30	0.6633	0.2400	0.4916	3224.0
140.0	0.01985	969.0	156.0	-51.91	-51.84	0.6812	0.2370	0.4933	3057.0
* 144.100	0.02012	878.0	145.0	-49.89	-49.81	0.6955	0.2345	0.4950	2930.0
* 144.100	2.612	49.3	0.154	24.40	34.08	1.278	0.1856	0.2733	580.0
145.0	2.632	49.7	0.153	24.57	34.32	1.280	0.1854	0.2727	582.2
150.0	2.737	52.0	0.146	25.54	35.68	1.289	0.1843	0.2697	594.0
155.0	2.842	54.3	0.140	26.49	37.02	1.298	0.1833	0.2672	605.5
160.0	2.946	56.5	0.135	27.44	38.35	1.306	0.1826	0.2650	616.7
165.0	3.049	58.7	0.130	28.38	39.67	1.314	0.1819	0.2632	627.6
170.0	3.151	60.9	0.125	29.31	40.98	1.322	0.1814	0.2617	638.2
175.0	3.253	63.1	0.121	30.24	42.29	1.330	0.1809	0.2604	648.6
180.0	3.354	65.2	0.117	31.16	43.58	1.337	0.1805	0.2593	658.7
185.0	3.455	67.3	0.113	32.08	44.88	1.344	0.1802	0.2583	668.7
190.0	3.555	69.4	0.110	33.00	46.17	1.351	0.1799	0.2574	678.5
200.0	3.755	73.6	0.104	34.83	48.73	1.364	0.1794	0.2560	697.5
205.0	3.854	75.6	0.101	35.74	50.01	1.371	0.1792	0.2554	706.7
210.0	3.953	77.7	0.0985	36.65	51.29	1.377	0.1790	0.2549	715.9
215.0	4.052	79.7	0.0960	37.55	52.56	1.383	0.1789	0.2544	724.8
220.0	4.151	81.8	0.0936	38.46	53.83	1.389	0.1787	0.2539	733.7
225.0	4.249	83.8	0.0914	39.36	55.10	1.394	0.1786	0.2536	742.4
230.0	4.348	85.8	0.0892	40.27	56.37	1.400	0.1785	0.2532	751.0
235.0	4.446	87.8	0.0872	41.17	57.63	1.405	0.1784	0.2529	759.5
240.0	4.544	89.8	0.0853	42.07	58.90	1.411	0.1783	0.2526	767.9
245.0	4.642	91.8	0.0834	42.97	60.16	1.416	0.1782	0.2524	776.2
250.0	4.740	93.8	0.0817	43.87	61.42	1.421	0.1782	0.2521	784.4
255.0	4.838	95.8	0.0800	44.76	62.68	1.426	0.1781	0.2519	792.4
260.0	4.935	97.8	0.0784	45.66	63.94	1.431	0.1780	0.2517	800.4
265.0	5.033	100.0	0.0768	46.56	65.20	1.436	0.1780	0.2515	808.3
270.0	5.130	102.0	0.0753	47.45	66.45	1.440	0.1779	0.2513	816.2
275.0	5.228	104.0	0.0739	48.35	67.71	1.445	0.1779	0.2512	823.9
280.0	5.325	106.0	0.0725	49.25	68.97	1.449	0.1779	0.2510	831.6
285.0	5.422	108.0	0.0712	50.14	70.22	1.454	0.1778	0.2509	839.1
290.0	5.519	110.0	0.0700	51.03	71.48	1.458	0.1778	0.2508	846.7
295.0	5.616	112.0	0.0687	51.93	72.73	1.462	0.1778	0.2507	854.1
300.0	5.714	114.0	0.0675	52.82	73.98	1.467	0.1777	0.2506	861.5
310.0	5.907	118.0	0.0653	54.61	76.49	1.475	0.1777	0.2504	876.0
320.0	6.101	121.0	0.0632	56.39	78.99	1.483	0.1776	0.2502	890.3
330.0	6.295	125.0	0.0612	58.18	81.49	1.491	0.1776	0.2500	904.3
340.0	6.488	129.0	0.0594	59.96	83.99	1.498	0.1776	0.2499	918.1
350.0	6.682	133.0	0.0577	61.74	86.49	1.505	0.1776	0.2498	931.7
360.0	6.875	137.0	0.0560	63.52	88.99	1.512	0.1775	0.2497	945.1
370.0	7.068	141.0	0.0545	65.31	91.48	1.519	0.1775	0.2496	958.3
380.0	7.261	145.0	0.0530	67.09	93.98	1.526	0.1775	0.2495	971.3
390.0	7.454	149.0	0.0516	68.87	96.47	1.532	0.1775	0.2494	984.1
400.0	7.647	153.0	0.0503	70.65	98.97	1.539	0.1775	0.2493	997.0
410.0	7.839	157.0	0.0491	72.42	101.5	1.545	0.1774	0.2493	1009.0
420.0	8.032	160.0	0.0479	74.20	104.0	1.551	0.1774	0.2492	1022.0
430.0	8.225	164.0	0.0468	75.98	106.4	1.557	0.1774	0.2491	1034.0
440.0	8.417	168.0	0.0457	77.76	108.9	1.562	0.1774	0.2491	1046.0
450.0	8.610	172.0	0.0447	79.54	111.4	1.568	0.1774	0.2491	1058.0
460.0	8.802	176.0	0.0437	81.31	113.9	1.573	0.1774	0.2490	1069.0
470.0	8.995	180.0	0.0427	83.09	116.4	1.579	0.1774	0.2490	1081.0
480.0	9.187	184.0	0.0418	84.87	118.9	1.584	0.1774	0.2490	1093.0
490.0	9.379	187.0	0.0410	86.65	121.4	1.589	0.1774	0.2489	1104.0
500.0	9.572	191.0	0.0402	88.42	123.9	1.594	0.1774	0.2489	1115.0
510.0	9.764	195.0	0.0394	90.20	126.4	1.599	0.1774	0.2489	1126.0
520.0	9.96	199.0	0.0386	91.98	128.9	1.604	0.1774	0.2489	1137.0
530.0	10.15	203.0	0.0379	93.75	131.3	1.609	0.1774	0.2489	1148.0
540.0	10.34	207.0	0.0372	95.53	133.8	1.613	0.1775	0.2489	1159.0
550.0	10.53	211.0	0.0365	97.31	136.3	1.618	0.1775	0.2489	1170.0
560.0	10.72	214.0	0.0358	99.08	138.8	1.622	0.1775	0.2489	1180.0
570.0	10.92	218.0	0.0352	100.9	141.3	1.627	0.1775	0.2489	1191.0
580.0	11.11	222.0	0.0346	102.6	143.8	1.631	0.1776	0.2489	1201.0
590.0	11.30	226.0	0.0340	104.4	146.3	1.635	0.1776	0.2489	1211.0
600.0	11.49	230.0	0.0334	106.2	148.8	1.640	0.1776	0.2489	1222.0
700.0	13.41	268.0	0.0286	124.0	173.7	1.678	0.1782	0.2494	1319.0
800.0	15.33	307.0	0.0250	141.9	198.7	1.711	0.1794	0.2505	1409.0
900.0	17.25	345.0	0.0222	159.9	223.8	1.741	0.1812	0.2523	1492.0
1000.0	19.16	384.0	0.0200	178.2	249.1	1.768	0.1835	0.2545	1570.0
1500.0	28.75	575.0	0.0133	273.6	380.1	1.874	0.1987	0.2697	1902.0
2000.0	38.32	767.0	0.0100	376.6	518.5	1.953	0.2125	0.2835	2177.0
2500.0	47.90	958.0	0.00800	485.5	662.9	2.018	0.2224	0.2934	2420.0
3000.0	57.48	1150.0	0.00667	598.5	811.4	2.072	0.2293	0.3002	2641.0
3500.0	67.06	1340.0	0.00571	714.4	962.8	2.118	0.2340	0.3050	2846.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

20 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.01	195.0	19.9	103000.0	0.00242	0.0940	19.8	0.00370	1.46536	3.56
120.0	53.34	188.0	17.5	87600.0	0.00257	0.0909	16.8	0.00354	1.45894	3.20
125.0	52.64	179.0	15.9	74900.0	0.00272	0.0877	14.6	0.00342	1.45224	2.92
130.0	51.91	171.0	14.7	64600.0	0.00287	0.0846	13.0	0.00333	1.44525	2.72
135.0	51.15	162.0	13.8	56000.0	0.00303	0.0814	11.9	0.00324	1.43801	2.59
140.0	50.36	154.0	13.1	48800.0	0.00319	0.0782	10.9	0.00315	1.43050	2.47
* 144.100	49.69	148.0	12.5	43600.0	0.00333	0.0757	10.0	0.00308	1.42414	2.35
* 144.100	0.3828	33.5	2.17	18.9	0.00817	0.00458	0.376	0.0438	1.00289	0.807
145.0	0.3800	33.7	2.17	18.9	0.00809	0.00461	0.378	0.0445	1.00286	0.805
150.0	0.3653	35.1	2.17	19.0	0.00769	0.00475	0.389	0.0482	1.00275	0.795
155.0	0.3519	36.4	2.17	19.1	0.00733	0.00490	0.401	0.0521	1.00265	0.787
160.0	0.3395	37.8	2.17	19.2	0.00702	0.00504	0.413	0.0561	1.00256	0.781
165.0	0.3280	39.1	2.17	19.3	0.00673	0.00519	0.425	0.0601	1.00247	0.775
170.0	0.3174	40.4	2.17	19.3	0.00647	0.00534	0.437	0.0643	1.00239	0.771
175.0	0.3074	41.8	2.17	19.4	0.00624	0.00549	0.449	0.0685	1.00232	0.767
180.0	0.2982	43.1	2.17	19.4	0.00602	0.00563	0.461	0.0729	1.00225	0.763
185.0	0.2895	44.4	2.17	19.5	0.00582	0.00578	0.473	0.0773	1.00218	0.761
190.0	0.2813	45.7	2.17	19.5	0.00563	0.00593	0.485	0.0819	1.00212	0.758
200.0	0.2663	48.3	2.17	19.6	0.00530	0.00622	0.509	0.0913	1.00201	0.754
205.0	0.2595	49.6	2.17	19.6	0.00515	0.00637	0.521	0.0961	1.00195	0.752
210.0	0.2530	50.9	2.17	19.7	0.00501	0.00651	0.533	0.101	1.00191	0.751
215.0	0.2468	52.2	2.17	19.7	0.00488	0.00666	0.545	0.106	1.00186	0.749
220.0	0.2409	53.4	2.17	19.7	0.00475	0.00681	0.557	0.111	1.00182	0.748
225.0	0.2353	54.7	2.17	19.7	0.00463	0.00695	0.569	0.117	1.00177	0.747
230.0	0.2300	56.0	2.17	19.7	0.00452	0.00710	0.581	0.122	1.00173	0.746
235.0	0.2249	57.3	2.17	19.8	0.00442	0.00724	0.592	0.127	1.00169	0.745
240.0	0.2201	58.6	2.17	19.8	0.00431	0.00739	0.604	0.133	1.00166	0.744
245.0	0.2154	59.8	2.17	19.8	0.00422	0.00753	0.616	0.138	1.00162	0.743
250.0	0.2110	61.1	2.17	19.8	0.00413	0.00767	0.627	0.144	1.00159	0.742
255.0	0.2067	62.4	2.17	19.8	0.00404	0.00781	0.639	0.150	1.00156	0.741
260.0	0.2026	63.6	2.17	19.8	0.00395	0.00796	0.650	0.156	1.00153	0.741
265.0	0.1987	64.9	2.17	19.8	0.00387	0.00810	0.662	0.162	1.00150	0.740
270.0	0.1949	66.2	2.17	19.8	0.00380	0.00824	0.673	0.168	1.00147	0.739
275.0	0.1913	67.4	2.17	19.8	0.00372	0.00838	0.685	0.174	1.00144	0.739
280.0	0.1878	68.7	2.17	19.9	0.00365	0.00852	0.696	0.181	1.00141	0.738
285.0	0.1844	70.0	2.17	19.9	0.00359	0.00866	0.707	0.187	1.00139	0.738
290.0	0.1812	71.2	2.17	19.9	0.00352	0.00880	0.718	0.194	1.00136	0.737
295.0	0.1780	72.5	2.17	19.9	0.00346	0.00893	0.729	0.200	1.00134	0.737
300.0	0.1750	73.8	2.17	19.9	0.00340	0.00907	0.740	0.207	1.00132	0.736
310.0	0.1693	76.3	2.17	19.9	0.00328	0.00935	0.762	0.221	1.00128	0.735
320.0	0.1639	78.8	2.17	19.9	0.00317	0.00962	0.784	0.235	1.00123	0.734
330.0	0.1589	81.3	2.17	19.9	0.00307	0.00988	0.805	0.249	1.00120	0.733
340.0	0.1541	83.8	2.17	19.9	0.00298	0.0101	0.827	0.264	1.00116	0.733
350.0	0.1497	86.4	2.17	19.9	0.00289	0.0104	0.848	0.279	1.00113	0.732
360.0	0.1455	88.9	2.17	19.9	0.00281	0.0107	0.868	0.294	1.00110	0.731
370.0	0.1415	91.4	2.17	19.9	0.00273	0.0109	0.889	0.310	1.00107	0.731
380.0	0.1377	93.9	2.17	20.0	0.00266	0.0112	0.909	0.326	1.00104	0.730
390.0	0.1342	96.4	2.17	20.0	0.00259	0.0114	0.929	0.342	1.00101	0.729
400.0	0.1308	98.9	2.17	20.0	0.00252	0.0117	0.949	0.359	1.00098	0.729
410.0	0.1276	101.0	2.17	20.0	0.00246	0.0119	0.969	0.376	1.00096	0.728
420.0	0.1245	104.0	2.17	20.0	0.00240	0.0122	0.989	0.393	1.00094	0.728
430.0	0.1216	106.0	2.17	20.0	0.00234	0.0124	1.01	0.410	1.00092	0.727
440.0	0.1188	109.0	2.17	20.0	0.00229	0.0127	1.03	0.428	1.00089	0.727
450.0	0.1161	111.0	2.17	20.0	0.00224	0.0129	1.05	0.447	1.00087	0.726
460.0	0.1136	114.0	2.17	20.0	0.00219	0.0132	1.07	0.465	1.00086	0.726
470.0	0.1112	116.0	2.17	20.0	0.00214	0.0134	1.08	0.484	1.00084	0.725
480.0	0.1088	119.0	2.17	20.0	0.00209	0.0136	1.10	0.503	1.00082	0.725
490.0	0.1066	121.0	2.17	20.0	0.00205	0.0139	1.12	0.522	1.00080	0.725
500.0	0.1045	124.0	2.17	20.0	0.00201	0.0141	1.14	0.542	1.00079	0.724
510.0	0.1024	126.0	2.17	20.0	0.00197	0.0143	1.16	0.562	1.00077	0.724
520.0	0.1004	129.0	2.17	20.0	0.00193	0.0145	1.17	0.582	1.00076	0.723
530.0	0.09854	131.0	2.17	20.0	0.00189	0.0148	1.19	0.602	1.00074	0.723
540.0	0.09671	134.0	2.16	20.0	0.00186	0.0150	1.21	0.623	1.00073	0.723
550.0	0.09494	136.0	2.16	20.0	0.00182	0.0152	1.23	0.644	1.00072	0.722
560.0	0.09324	139.0	2.16	20.0	0.00179	0.0154	1.24	0.665	1.00070	0.722
570.0	0.09160	141.0	2.16	20.0	0.00176	0.0157	1.26	0.687	1.00069	0.722
580.0	0.09002	144.0	2.16	20.0	0.00173	0.0159	1.28	0.708	1.00068	0.721
590.0	0.08849	146.0	2.16	20.0	0.00170	0.0161	1.29	0.730	1.00067	0.721
600.0	0.08701	149.0	2.16	20.0	0.00167	0.0163	1.31	0.753	1.00066	0.721
700.0	0.07456	174.0	2.15	20.0	0.00143	0.0184	1.47	0.989	1.00056	0.718
800.0	0.06523	200.0	2.14	20.0	0.00125	0.0204	1.62	1.25	1.00049	0.716
900.0	0.05798	227.0	2.12	20.0	0.00111	0.0223	1.76	1.53	1.00044	0.714
1000.0	0.05218	254.0	2.09	20.0	0.00100	0.0243	1.89	1.83	1.00039	0.713
1500.0	0.03473	405.0	1.93	20.0	0.000666					
2000.0	0.02609	567.0	1.80	20.0	0.000500					
2500.0	0.02088	734.0	1.72	20.0	0.000400					
3000.0	0.01740	901.0	1.67	20.0	0.000333					
3500.0	0.01491	1070.0	1.64	20.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

25 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01851	1910.0	250.0	-64.08	-63.99	0.5855	0.2324	0.4705	4237.0
120.0	0.01875	1640.0	225.0	-61.70	-61.61	0.6058	0.2413	0.4813	3896.0
125.0	0.01900	1420.0	204.0	-59.28	-59.19	0.6255	0.2437	0.4868	3631.0
130.0	0.01925	1250.0	186.0	-56.83	-55.74	0.6447	0.2427	0.4897	3413.0
135.0	0.01955	1100.0	170.0	-54.38	-54.29	0.6632	0.2402	0.4915	3225.0
140.0	0.01985	970.0	156.0	-51.92	-51.83	0.6811	0.2371	0.4932	3057.0
145.0	0.02013	860.0	143.0	-49.45	-49.36	0.6985	0.2341	0.4953	2904.0
* 147.900	0.02038	803.0	137.0	-48.02	-47.93	0.7082	0.2325	0.4970	2821.0
* 147.900	2.124	49.6	0.191	24.86	34.59	1.267	0.1868	0.2778	584.4
150.0	2.161	50.6	0.187	25.28	35.28	1.271	0.1862	0.2761	589.6
155.0	2.247	53.0	0.179	26.25	36.65	1.280	0.1850	0.2727	601.5
160.0	2.332	55.3	0.172	27.22	38.01	1.289	0.1840	0.2699	613.0
165.0	2.416	57.6	0.165	28.17	39.35	1.297	0.1832	0.2675	624.2
170.0	2.499	59.8	0.159	29.12	40.69	1.305	0.1825	0.2655	635.1
175.0	2.582	62.1	0.153	30.06	42.01	1.313	0.1819	0.2638	645.8
180.0	2.664	64.2	0.148	30.99	43.32	1.320	0.1814	0.2623	656.1
185.0	2.745	66.4	0.144	31.92	44.63	1.327	0.1809	0.2610	666.3
190.0	2.827	68.6	0.139	32.85	45.93	1.334	0.1805	0.2599	676.2
200.0	2.988	72.8	0.131	34.69	48.52	1.348	0.1799	0.2580	695.6
205.0	3.068	74.9	0.128	35.61	49.81	1.354	0.1797	0.2573	705.0
210.0	3.148	77.0	0.124	36.52	51.10	1.360	0.1794	0.2566	714.2
215.0	3.228	79.1	0.121	37.43	52.38	1.366	0.1793	0.2560	723.3
220.0	3.308	81.1	0.118	38.34	53.66	1.372	0.1791	0.2555	732.2
225.0	3.387	83.2	0.115	39.25	54.93	1.378	0.1789	0.2550	741.1
230.0	3.467	85.2	0.112	40.16	56.21	1.384	0.1788	0.2545	749.8
235.0	3.546	87.3	0.110	41.06	57.48	1.385	0.1787	0.2541	758.3
240.0	3.625	89.3	0.107	41.97	58.75	1.394	0.1786	0.2538	766.8
245.0	3.703	91.3	0.105	42.87	60.02	1.400	0.1785	0.2534	775.1
250.0	3.782	93.3	0.103	43.77	61.28	1.405	0.1784	0.2531	783.4
255.0	3.861	95.4	0.100	44.67	62.55	1.410	0.1783	0.2528	791.5
260.0	3.939	97.4	0.0984	45.57	63.81	1.415	0.1782	0.2526	799.6
265.0	4.018	99.4	0.0965	46.47	65.07	1.419	0.1782	0.2524	807.6
270.0	4.096	101.0	0.0946	47.37	66.33	1.424	0.1781	0.2521	815.4
275.0	4.174	103.0	0.0928	48.27	67.59	1.429	0.1781	0.2519	823.2
280.0	4.252	105.0	0.0910	49.17	68.85	1.433	0.1780	0.2518	830.9
285.0	4.330	107.0	0.0894	50.06	70.11	1.438	0.1780	0.2516	838.5
290.0	4.408	109.0	0.0878	50.96	71.37	1.442	0.1779	0.2514	846.1
295.0	4.486	111.0	0.0862	51.86	72.63	1.446	0.1779	0.2513	853.6
300.0	4.564	113.0	0.0847	52.75	73.88	1.451	0.1778	0.2511	861.0
310.0	4.720	117.0	0.0819	54.54	75.39	1.459	0.1778	0.2509	875.6
320.0	4.875	121.0	0.0792	56.33	78.90	1.467	0.1777	0.2507	889.9
330.0	5.031	125.0	0.0767	58.12	81.41	1.475	0.1777	0.2505	904.0
340.0	5.186	129.0	0.0744	59.90	83.91	1.482	0.1777	0.2503	917.9
350.0	5.341	133.0	0.0722	61.69	86.41	1.489	0.1776	0.2502	931.5
360.0	5.496	137.0	0.0702	63.47	88.91	1.496	0.1776	0.2500	944.9
370.0	5.651	141.0	0.0682	65.25	91.41	1.503	0.1776	0.2499	958.2
380.0	5.805	145.0	0.0664	67.04	93.91	1.510	0.1775	0.2498	971.2
390.0	5.960	149.0	0.0647	68.82	96.41	1.516	0.1775	0.2497	984.1
400.0	6.114	152.0	0.0630	70.60	98.91	1.523	0.1775	0.2496	997.0
410.0	6.269	156.0	0.0614	72.38	101.4	1.529	0.1775	0.2495	1009.0
420.0	6.423	160.0	0.0600	74.16	103.9	1.535	0.1775	0.2494	1022.0
430.0	6.577	164.0	0.0585	75.94	106.4	1.541	0.1775	0.2494	1034.0
440.0	6.732	168.0	0.0572	77.72	108.9	1.546	0.1775	0.2493	1046.0
450.0	6.886	172.0	0.0559	79.50	111.4	1.552	0.1774	0.2493	1058.0
460.0	7.040	176.0	0.0547	81.28	113.9	1.557	0.1774	0.2492	1070.0
470.0	7.194	180.0	0.0535	83.06	116.4	1.563	0.1774	0.2492	1081.0
480.0	7.348	184.0	0.0524	84.83	118.9	1.568	0.1774	0.2491	1093.0
490.0	7.502	187.0	0.0513	86.61	121.3	1.573	0.1774	0.2491	1104.0
500.0	7.656	191.0	0.0502	88.39	123.8	1.578	0.1774	0.2491	1115.0
510.0	7.810	195.0	0.0492	90.17	126.3	1.583	0.1775	0.2490	1126.0
520.0	7.964	199.0	0.0483	91.94	128.8	1.588	0.1775	0.2490	1137.0
530.0	8.118	203.0	0.0474	93.72	131.3	1.593	0.1775	0.2490	1148.0
540.0	8.272	207.0	0.0465	95.50	133.8	1.597	0.1775	0.2490	1159.0
550.0	8.426	211.0	0.0456	97.28	136.3	1.602	0.1775	0.2490	1170.0
560.0	8.579	214.0	0.0448	99.06	138.8	1.606	0.1775	0.2490	1180.0
570.0	8.733	218.0	0.0440	100.8	141.3	1.611	0.1775	0.2490	1191.0
580.0	8.887	222.0	0.0432	102.6	143.8	1.615	0.1776	0.2490	1201.0
590.0	9.041	226.0	0.0425	104.4	146.2	1.619	0.1776	0.2490	1212.0
600.0	9.194	230.0	0.0418	106.2	148.7	1.624	0.1776	0.2490	1222.0
700.0	10.73	268.0	0.0358	124.0	173.7	1.662	0.1783	0.2495	1319.0
800.0	12.27	307.0	0.0313	141.9	198.7	1.695	0.1754	0.2506	1409.0
900.0	13.80	345.0	0.0278	159.9	223.8	1.725	0.1812	0.2523	1492.0
1000.0	15.33	384.0	0.0250	178.1	249.1	1.752	0.1835	0.2546	1570.0
1500.0	23.00	575.0	0.0167	273.6	380.1	1.858	0.1987	0.2697	1902.0
2000.0	30.66	767.0	0.0125	376.6	518.5	1.937	0.2125	0.2835	2177.0
2500.0	38.32	959.0	0.0100	485.5	662.9	2.002	0.2224	0.2934	2420.0
3000.0	45.99	1150.0	0.00833	598.5	811.4	2.056	0.2293	0.3002	2641.0
3500.0	53.65	1340.0	0.00714	714.4	962.8	2.102	0.2340	0.3050	2846.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

25 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.01	195.0	19.9	103000.0	0.00242	0.0940	19.8	0.00370	1.46538	3.56
120.0	53.34	188.0	17.5	87600.0	0.00256	0.0909	16.8	0.00354	1.45897	3.20
125.0	52.64	179.0	15.9	75000.0	0.00272	0.0877	14.6	0.00342	1.45227	2.92
130.0	51.91	171.0	14.7	64700.0	0.00287	0.0846	13.1	0.00333	1.44529	2.72
135.0	51.15	162.0	13.8	56100.0	0.00303	0.0814	11.9	0.00324	1.43805	2.59
140.0	50.37	155.0	13.1	48900.0	0.00319	0.0783	10.9	0.00315	1.43055	2.47
145.0	49.55	147.0	12.4	42600.0	0.00336	0.0751	9.86	0.00306	1.42279	2.34
* 147.900	49.06	143.0	12.0	39400.0	0.00347	0.0734	9.41	0.00301	1.41821	2.30
* 147.900	0.4708	33.9	2.17	23.3	0.00819	0.00473	0.387	0.0362	1.00355	0.817
150.0	0.4628	34.5	2.17	23.4	0.00800	0.00479	0.392	0.0375	1.00349	0.812
155.0	0.4451	35.9	2.18	23.6	0.00760	0.00494	0.403	0.0407	1.00336	0.802
160.0	0.4289	37.3	2.18	23.7	0.00724	0.00508	0.415	0.0439	1.00323	0.793
165.0	0.4140	38.6	2.18	23.8	0.00692	0.00523	0.427	0.0472	1.00312	0.786
170.0	0.4002	40.0	2.18	23.9	0.00664	0.00537	0.439	0.0506	1.00302	0.780
175.0	0.3874	41.3	2.18	24.0	0.00638	0.00552	0.451	0.0540	1.00292	0.775
180.0	0.3754	42.7	2.18	24.1	0.00615	0.00567	0.463	0.0575	1.00283	0.771
185.0	0.3642	44.0	2.18	24.2	0.00593	0.00581	0.475	0.0611	1.00275	0.767
190.0	0.3538	45.3	2.18	24.3	0.00574	0.00596	0.487	0.0648	1.00267	0.764
200.0	0.3347	47.9	2.18	24.4	0.00538	0.00625	0.511	0.0724	1.00252	0.759
205.0	0.3259	49.2	2.18	24.4	0.00522	0.00640	0.523	0.0763	1.00246	0.757
210.0	0.3176	50.5	2.18	24.5	0.00508	0.00654	0.535	0.0803	1.00239	0.755
215.0	0.3098	51.8	2.18	24.5	0.00494	0.00669	0.546	0.0843	1.00233	0.753
220.0	0.3023	53.1	2.18	24.5	0.00481	0.00683	0.558	0.0885	1.00228	0.751
225.0	0.2952	54.4	2.18	24.6	0.00468	0.00698	0.570	0.0927	1.00222	0.750
230.0	0.2885	55.7	2.18	24.6	0.00457	0.00712	0.582	0.0970	1.00217	0.749
235.0	0.2820	57.0	2.18	24.6	0.00446	0.00727	0.594	0.101	1.00213	0.747
240.0	0.2759	58.3	2.18	24.6	0.00435	0.00741	0.605	0.106	1.00208	0.746
245.0	0.2700	59.6	2.18	24.7	0.00425	0.00755	0.617	0.110	1.00203	0.745
250.0	0.2644	60.9	2.18	24.7	0.00416	0.00769	0.629	0.115	1.00199	0.744
255.0	0.2590	62.1	2.18	24.7	0.00407	0.00784	0.640	0.120	1.00195	0.743
260.0	0.2539	63.4	2.18	24.7	0.00398	0.00798	0.652	0.124	1.00191	0.743
265.0	0.2489	64.7	2.18	24.7	0.00390	0.00812	0.663	0.129	1.00188	0.742
270.0	0.2441	66.0	2.18	24.7	0.00382	0.00826	0.674	0.134	1.00184	0.741
275.0	0.2396	67.2	2.18	24.8	0.00375	0.00840	0.686	0.139	1.00180	0.740
280.0	0.2352	68.5	2.17	24.8	0.00367	0.00854	0.697	0.144	1.00177	0.740
285.0	0.2309	69.8	2.17	24.8	0.00361	0.00868	0.708	0.149	1.00174	0.739
290.0	0.2268	71.1	2.17	24.8	0.00354	0.00882	0.719	0.155	1.00171	0.739
295.0	0.2229	72.3	2.17	24.8	0.00347	0.00895	0.730	0.160	1.00168	0.738
300.0	0.2191	73.6	2.17	24.8	0.00341	0.00909	0.741	0.165	1.00165	0.737
310.0	0.2119	76.1	2.17	24.8	0.00330	0.00936	0.763	0.176	1.00160	0.736
320.0	0.2051	78.7	2.17	24.9	0.00319	0.00963	0.785	0.187	1.00155	0.735
330.0	0.1988	81.2	2.17	24.9	0.00309	0.00990	0.806	0.199	1.00150	0.734
340.0	0.1928	83.7	2.17	24.9	0.00299	0.0102	0.828	0.211	1.00145	0.734
350.0	0.1872	86.2	2.17	24.9	0.00290	0.0104	0.848	0.223	1.00141	0.733
360.0	0.1820	88.7	2.17	24.9	0.00282	0.0107	0.869	0.235	1.00137	0.732
370.0	0.1770	91.3	2.17	24.9	0.00274	0.0109	0.890	0.248	1.00133	0.731
380.0	0.1723	93.8	2.17	24.9	0.00266	0.0112	0.910	0.260	1.00130	0.731
390.0	0.1678	96.3	2.17	24.9	0.00259	0.0115	0.930	0.273	1.00126	0.730
400.0	0.1635	98.8	2.17	24.9	0.00253	0.0117	0.950	0.287	1.00123	0.729
410.0	0.1595	101.0	2.17	24.9	0.00246	0.0120	0.970	0.300	1.00120	0.729
420.0	0.1557	104.0	2.17	25.0	0.00240	0.0122	0.989	0.314	1.00117	0.728
430.0	0.1520	106.0	2.17	25.0	0.00235	0.0124	1.01	0.328	1.00115	0.728
440.0	0.1485	109.0	2.17	25.0	0.00229	0.0127	1.03	0.343	1.00112	0.727
450.0	0.1452	111.0	2.17	25.0	0.00224	0.0129	1.05	0.357	1.00109	0.727
460.0	0.1420	114.0	2.17	25.0	0.00219	0.0132	1.07	0.372	1.00107	0.726
470.0	0.1390	116.0	2.17	25.0	0.00214	0.0134	1.08	0.387	1.00105	0.726
480.0	0.1361	119.0	2.17	25.0	0.00210	0.0136	1.10	0.402	1.00102	0.725
490.0	0.1333	121.0	2.17	25.0	0.00205	0.0139	1.12	0.418	1.00100	0.725
500.0	0.1306	124.0	2.17	25.0	0.00201	0.0141	1.14	0.433	1.00098	0.724
510.0	0.1280	126.0	2.17	25.0	0.00197	0.0143	1.16	0.449	1.00096	0.724
520.0	0.1256	129.0	2.17	25.0	0.00193	0.0146	1.17	0.465	1.00095	0.724
530.0	0.1232	131.0	2.17	25.0	0.00190	0.0148	1.19	0.482	1.00093	0.723
540.0	0.1209	134.0	2.17	25.0	0.00186	0.0150	1.21	0.498	1.00091	0.723
550.0	0.1187	136.0	2.17	25.0	0.00183	0.0152	1.23	0.515	1.00089	0.723
560.0	0.1166	139.0	2.17	25.0	0.00179	0.0154	1.24	0.532	1.00088	0.722
570.0	0.1145	141.0	2.16	25.0	0.00176	0.0157	1.26	0.549	1.00086	0.722
580.0	0.1125	144.0	2.16	25.0	0.00173	0.0159	1.28	0.567	1.00085	0.722
590.0	0.1106	146.0	2.16	25.0	0.00170	0.0161	1.30	0.584	1.00083	0.721
600.0	0.1088	149.0	2.16	25.0	0.00167	0.0163	1.31	0.602	1.00082	0.721
700.0	0.09319	174.0	2.15	25.0	0.00143	0.0184	1.47	0.791	1.00070	0.718
800.0	0.08153	200.0	2.14	25.0	0.00125	0.0204	1.62	1.00	1.00061	0.716
900.0	0.07246	227.0	2.12	25.0	0.00111	0.0224	1.76	1.22	1.00055	0.714
1000.0	0.06521	255.0	2.09	25.0	0.00100	0.0243	1.89	1.46	1.00049	0.713
1500.0	0.04348	405.0	1.93	25.0	0.000666					
2000.0	0.03261	567.0	1.80	25.0	0.000500					
2500.0	0.02609	734.0	1.72	25.0	0.000400					
3000.0	0.02175	901.0	1.67	25.0	0.000333					
3500.0	0.01864	1070.0	1.64	25.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

30 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01851	1920.0	250.0	-64.08	-63.98	0.5854	0.2326	0.4704	4237.0
120.0	0.01875	1640.0	225.0	-61.70	-61.60	0.6057	0.2414	0.4812	3896.0
125.0	0.01899	1430.0	204.0	-59.28	-59.18	0.6255	0.2438	0.4868	3631.0
130.0	0.01923	1250.0	186.0	-56.84	-56.73	0.6446	0.2428	0.4897	3413.0
135.0	0.01955	1100.0	170.0	-54.39	-54.28	0.6632	0.2403	0.4914	3225.0
140.0	0.01985	971.0	156.0	-51.93	-51.82	0.6811	0.2372	0.4930	3058.0
145.0	0.02018	861.0	143.0	-49.46	-49.35	0.6984	0.2342	0.4952	2905.0
150.0	0.02053	764.0	132.0	-46.98	-46.87	0.7152	0.2314	0.4983	2761.0
* 151.100	0.02061	744.0	130.0	-46.42	-46.31	0.7189	0.2309	0.4992	2730.0
* 151.100	1.793	49.7	0.228	25.23	35.19	1.259	0.1879	0.2821	587.8
155.0	1.849	51.6	0.220	26.00	36.28	1.266	0.1867	0.2787	597.4
160.0	1.922	54.0	0.210	26.99	37.66	1.275	0.1855	0.2751	609.3
165.0	1.993	56.4	0.202	27.96	39.03	1.283	0.1845	0.2721	620.8
170.0	2.064	58.7	0.194	28.92	40.38	1.291	0.1836	0.2695	632.0
175.0	2.134	61.0	0.187	29.87	41.73	1.299	0.1829	0.2673	642.9
180.0	2.203	63.3	0.180	30.82	43.06	1.306	0.1822	0.2655	653.5
185.0	2.272	65.5	0.174	31.76	44.38	1.314	0.1817	0.2639	663.9
190.0	2.341	67.7	0.169	32.69	45.70	1.321	0.1812	0.2625	674.0
200.0	2.477	72.0	0.159	34.55	48.31	1.334	0.1805	0.2602	693.6
205.0	2.545	74.2	0.154	35.47	43.61	1.340	0.1802	0.2592	703.2
210.0	2.612	76.3	0.150	36.39	50.90	1.347	0.1799	0.2584	712.5
215.0	2.679	78.4	0.146	37.31	52.19	1.353	0.1797	0.2577	721.7
220.0	2.746	80.5	0.143	38.23	53.48	1.359	0.1794	0.2570	730.8
225.0	2.813	82.6	0.139	39.14	54.76	1.364	0.1793	0.2564	739.7
230.0	2.879	84.6	0.136	40.05	56.04	1.370	0.1791	0.2558	748.5
235.0	2.945	86.7	0.132	40.96	57.32	1.376	0.1790	0.2554	757.2
240.0	3.012	88.8	0.129	41.87	58.60	1.381	0.1788	0.2549	765.7
245.0	3.078	90.8	0.127	42.77	59.87	1.386	0.1787	0.2545	774.1
250.0	3.144	92.9	0.124	43.68	61.14	1.391	0.1786	0.2541	782.4
255.0	3.209	94.9	0.121	44.58	62.41	1.396	0.1785	0.2538	790.6
260.0	3.275	96.9	0.119	45.49	63.68	1.401	0.1784	0.2535	798.8
265.0	3.341	98.9	0.116	46.39	64.95	1.406	0.1783	0.2532	806.8
270.0	3.406	101.0	0.114	47.29	66.21	1.411	0.1783	0.2529	814.7
275.0	3.472	103.0	0.112	48.19	67.48	1.416	0.1782	0.2527	822.5
280.0	3.537	105.0	0.110	49.09	68.74	1.420	0.1781	0.2525	830.3
285.0	3.603	107.0	0.108	49.99	70.00	1.425	0.1781	0.2523	837.9
290.0	3.668	109.0	0.106	50.89	71.26	1.429	0.1780	0.2521	845.5
295.0	3.733	111.0	0.104	51.78	72.52	1.433	0.1780	0.2519	853.1
300.0	3.798	113.0	0.102	52.68	73.78	1.437	0.1780	0.2517	860.5
310.0	3.928	117.0	0.0985	54.47	76.30	1.446	0.1779	0.2514	875.2
320.0	4.058	121.0	0.0953	56.27	78.81	1.454	0.1778	0.2512	889.6
330.0	4.188	125.0	0.0923	58.06	81.32	1.461	0.1778	0.2509	903.7
340.0	4.318	129.0	0.0895	59.84	83.83	1.469	0.1777	0.2507	917.6
350.0	4.447	133.0	0.0869	61.63	86.34	1.476	0.1777	0.2506	931.3
360.0	4.576	137.0	0.0844	63.42	88.84	1.483	0.1776	0.2504	944.8
370.0	4.706	141.0	0.0820	65.20	91.34	1.490	0.1776	0.2502	958.0
380.0	4.835	145.0	0.0798	66.99	93.85	1.497	0.1776	0.2501	971.1
390.0	4.964	148.0	0.0777	68.77	96.35	1.503	0.1776	0.2500	984.0
400.0	5.093	152.0	0.0757	70.55	98.85	1.510	0.1775	0.2499	997.0
410.0	5.222	156.0	0.0738	72.33	101.3	1.516	0.1775	0.2498	1009.0
420.0	5.351	160.0	0.0721	74.12	103.8	1.522	0.1775	0.2497	1022.0
430.0	5.479	164.0	0.0703	75.90	106.3	1.528	0.1775	0.2496	1034.0
440.0	5.608	168.0	0.0687	77.68	108.8	1.533	0.1775	0.2495	1046.0
450.0	5.737	172.0	0.0672	79.46	111.3	1.539	0.1775	0.2495	1058.0
460.0	5.865	176.0	0.0657	81.24	113.8	1.544	0.1775	0.2494	1070.0
470.0	5.994	180.0	0.0643	83.02	116.3	1.550	0.1775	0.2494	1081.0
480.0	6.122	183.0	0.0629	84.80	118.8	1.555	0.1775	0.2493	1093.0
490.0	6.251	187.0	0.0616	86.58	121.3	1.560	0.1775	0.2493	1104.0
500.0	6.379	191.0	0.0603	88.36	123.8	1.565	0.1775	0.2492	1115.0
510.0	6.508	195.0	0.0591	90.13	126.3	1.570	0.1775	0.2492	1127.0
520.0	6.636	199.0	0.0580	91.91	128.8	1.575	0.1775	0.2492	1138.0
530.0	6.764	203.0	0.0569	93.69	131.3	1.580	0.1775	0.2491	1149.0
540.0	6.893	207.0	0.0558	95.47	133.8	1.584	0.1775	0.2491	1159.0
550.0	7.021	211.0	0.0548	97.25	136.3	1.589	0.1775	0.2491	1170.0
560.0	7.149	214.0	0.0538	99.03	138.7	1.593	0.1775	0.2491	1181.0
570.0	7.278	218.0	0.0529	100.8	141.2	1.598	0.1776	0.2491	1191.0
580.0	7.406	222.0	0.0519	102.6	143.7	1.602	0.1776	0.2491	1202.0
590.0	7.534	226.0	0.0510	104.4	146.2	1.606	0.1776	0.2491	1212.0
600.0	7.662	230.0	0.0502	106.1	148.7	1.611	0.1777	0.2491	1222.0
700.0	8.943	268.0	0.0430	124.0	173.6	1.649	0.1783	0.2496	1320.0
800.0	10.22	307.0	0.0376	141.9	198.6	1.682	0.1794	0.2506	1409.0
900.0	11.50	345.0	0.0334	159.9	223.8	1.712	0.1812	0.2523	1493.0
1000.0	12.78	384.0	0.0300	178.1	249.1	1.739	0.1835	0.2546	1571.0
1500.0	19.17	576.0	0.0200	273.6	380.1	1.845	0.1987	0.2697	1902.0
2000.0	25.55	767.0	0.0150	376.6	513.5	1.924	0.2125	0.2835	2177.0
2500.0	31.94	959.0	0.0120	485.5	662.9	1.989	0.2225	0.2934	2420.0
3000.0	38.32	1150.0	0.0100	598.5	811.4	2.043	0.2293	0.3002	2642.0
3500.0	44.71	1340.0	0.00857	714.4	962.8	2.090	0.2340	0.3050	2846.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

30 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.02	195.0	19.9	103000.0	0.00241	0.0940	19.8	0.00370	1.46541	3.56
120.0	53.35	188.0	17.4	87700.0	0.00256	0.0909	16.8	0.00354	1.45900	3.20
125.0	52.65	179.0	15.9	75000.0	0.00271	0.0878	14.6	0.00342	1.45230	2.92
130.0	51.92	171.0	14.7	64700.0	0.00287	0.0846	13.1	0.00333	1.44533	2.72
135.0	51.16	162.0	13.8	56100.0	0.00303	0.0814	11.9	0.00324	1.43809	2.59
140.0	50.37	155.0	13.0	48900.0	0.00319	0.0783	10.9	0.00315	1.43060	2.47
145.0	49.55	147.0	12.4	42700.0	0.00336	0.0752	9.86	0.00306	1.42285	2.34
150.0	48.71	141.0	11.7	37200.0	0.00355	0.0721	9.10	0.00297	1.41483	2.26
* 151.100	48.51	139.0	11.6	36100.0	0.00359	0.0714	8.93	0.00295	1.41300	2.25
* 151.100	0.5579	34.3	2.18	27.7	0.00823	0.00487	0.396	0.0309	1.00421	0.827
155.0	0.5407	35.4	2.18	27.9	0.00783	0.00498	0.405	0.0330	1.00408	0.817
160.0	0.5203	36.8	2.18	28.1	0.00748	0.00512	0.417	0.0358	1.00392	0.806
165.0	0.5017	38.2	2.18	28.3	0.00713	0.00527	0.429	0.0386	1.00378	0.798
170.0	0.4845	39.5	2.18	28.5	0.00682	0.00541	0.441	0.0414	1.00365	0.790
175.0	0.4686	40.9	2.18	28.6	0.00654	0.00555	0.453	0.0443	1.00353	0.784
180.0	0.4538	42.3	2.18	28.7	0.00628	0.00570	0.464	0.0473	1.00342	0.779
185.0	0.4401	43.6	2.18	28.8	0.00605	0.00584	0.476	0.0503	1.00332	0.774
190.0	0.4272	44.9	2.18	28.9	0.00584	0.00599	0.488	0.0534	1.00322	0.770
200.0	0.4037	47.6	2.18	29.1	0.00547	0.00628	0.512	0.0598	1.00304	0.764
205.0	0.3930	48.9	2.18	29.1	0.00530	0.00643	0.524	0.0631	1.00296	0.761
210.0	0.3829	50.2	2.18	29.2	0.00514	0.00657	0.536	0.0664	1.00289	0.759
215.0	0.3733	51.5	2.18	29.3	0.00500	0.00672	0.548	0.0698	1.00281	0.757
220.0	0.3642	52.8	2.18	29.3	0.00486	0.00686	0.560	0.0733	1.00274	0.755
225.0	0.3556	54.2	2.18	29.4	0.00473	0.00700	0.572	0.0768	1.00268	0.753
230.0	0.3473	55.5	2.18	29.4	0.00461	0.00715	0.583	0.0804	1.00262	0.752
235.0	0.3395	56.7	2.18	29.4	0.00450	0.00729	0.595	0.0841	1.00256	0.750
240.0	0.3321	58.0	2.18	29.5	0.00439	0.00743	0.607	0.0878	1.00250	0.749
245.0	0.3249	59.3	2.18	29.5	0.00429	0.00758	0.618	0.0916	1.00245	0.748
250.0	0.3181	60.6	2.18	29.5	0.00419	0.00772	0.630	0.0955	1.00240	0.747
255.0	0.3116	61.9	2.18	29.6	0.00410	0.00786	0.641	0.0994	1.00235	0.746
260.0	0.3053	63.2	2.18	29.6	0.00401	0.00800	0.653	0.103	1.00230	0.745
265.0	0.2993	64.5	2.18	29.6	0.00393	0.00814	0.664	0.107	1.00226	0.744
270.0	0.2936	65.8	2.18	29.6	0.00385	0.00828	0.676	0.112	1.00221	0.743
275.0	0.2880	67.0	2.18	29.7	0.00377	0.00842	0.687	0.116	1.00217	0.742
280.0	0.2827	68.3	2.18	29.7	0.00370	0.00856	0.698	0.120	1.00213	0.741
285.0	0.2776	69.6	2.18	29.7	0.00362	0.00870	0.709	0.124	1.00209	0.741
290.0	0.2726	70.9	2.18	29.7	0.00355	0.00884	0.720	0.129	1.00205	0.740
295.0	0.2679	72.1	2.18	29.7	0.00349	0.00897	0.731	0.133	1.00202	0.739
300.0	0.2633	73.4	2.18	29.7	0.00343	0.00911	0.742	0.137	1.00198	0.739
310.0	0.2546	76.0	2.18	29.8	0.00331	0.00938	0.764	0.147	1.00192	0.737
320.0	0.2464	78.5	2.18	29.8	0.00320	0.00965	0.786	0.156	1.00186	0.736
330.0	0.2388	81.0	2.18	29.8	0.00310	0.00992	0.807	0.166	1.00180	0.735
340.0	0.2316	83.6	2.17	29.8	0.00300	0.0102	0.828	0.175	1.00174	0.734
350.0	0.2249	86.1	2.17	29.9	0.00291	0.0104	0.849	0.185	1.00169	0.734
360.0	0.2185	88.6	2.17	29.9	0.00283	0.0107	0.870	0.196	1.00165	0.733
370.0	0.2125	91.1	2.17	29.9	0.00275	0.0110	0.891	0.206	1.00160	0.732
380.0	0.2068	93.7	2.17	29.9	0.00267	0.0112	0.911	0.217	1.00156	0.731
390.0	0.2015	96.2	2.17	29.9	0.00260	0.0115	0.931	0.228	1.00152	0.731
400.0	0.1964	98.7	2.17	29.9	0.00253	0.0117	0.951	0.239	1.00148	0.730
410.0	0.1915	101.0	2.17	29.9	0.00247	0.0120	0.971	0.250	1.00144	0.729
420.0	0.1869	104.0	2.17	29.9	0.00241	0.0122	0.990	0.262	1.00141	0.729
430.0	0.1825	106.0	2.17	29.9	0.00235	0.0125	1.01	0.273	1.00137	0.728
440.0	0.1783	109.0	2.17	29.9	0.00229	0.0127	1.03	0.285	1.00134	0.728
450.0	0.1743	111.0	2.17	30.0	0.00224	0.0129	1.05	0.298	1.00131	0.727
460.0	0.1705	114.0	2.17	30.0	0.00219	0.0132	1.07	0.310	1.00128	0.727
470.0	0.1668	116.0	2.17	30.0	0.00214	0.0134	1.09	0.322	1.00126	0.726
480.0	0.1633	119.0	2.17	30.0	0.00210	0.0136	1.10	0.335	1.00123	0.726
490.0	0.1600	121.0	2.17	30.0	0.00206	0.0139	1.12	0.348	1.00121	0.725
500.0	0.1568	124.0	2.17	30.0	0.00201	0.0141	1.14	0.361	1.00118	0.725
510.0	0.1537	126.0	2.17	30.0	0.00197	0.0143	1.16	0.374	1.00116	0.724
520.0	0.1507	129.0	2.17	30.0	0.00193	0.0146	1.18	0.388	1.00114	0.724
530.0	0.1478	131.0	2.17	30.0	0.00190	0.0148	1.19	0.402	1.00111	0.724
540.0	0.1451	134.0	2.17	30.0	0.00186	0.0150	1.21	0.415	1.00109	0.723
550.0	0.1424	136.0	2.17	30.0	0.00183	0.0152	1.23	0.429	1.00107	0.723
560.0	0.1399	139.0	2.17	30.0	0.00179	0.0155	1.24	0.444	1.00105	0.722
570.0	0.1374	141.0	2.17	30.0	0.00176	0.0157	1.26	0.458	1.00103	0.722
580.0	0.1350	144.0	2.17	30.0	0.00173	0.0159	1.28	0.472	1.00102	0.722
590.0	0.1327	146.0	2.17	30.0	0.00170	0.0161	1.30	0.487	1.00100	0.721
600.0	0.1305	149.0	2.16	30.0	0.00167	0.0163	1.31	0.502	1.00098	0.721
700.0	0.1118	174.0	2.16	30.0	0.00143	0.0184	1.47	0.659	1.00084	0.718
800.0	0.09782	200.0	2.14	30.0	0.00125	0.0204	1.62	0.832	1.00074	0.716
900.0	0.08694	227.0	2.12	30.0	0.00111	0.0224	1.76	1.02	1.00065	0.715
1000.0	0.07823	255.0	2.09	30.0	0.00100	0.0243	1.89	1.22	1.00059	0.713
1500.0	0.05217	405.0	1.93	30.0	0.000666					
2000.0	0.03913	567.0	1.80	30.0	0.000500					
2500.0	0.03131	734.0	1.72	30.0	0.000400					
3000.0	0.02603	901.0	1.67	30.0	0.000333					
3500.0	0.02237	1070.0	1.64	30.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

35 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01851	1920.0	250.0	-64.09	-63.37	0.5854	0.2327	0.4703	4236.0
120.0	0.01874	1640.0	225.0	-61.71	-61.58	0.6057	0.2415	0.4811	3896.0
125.0	0.01893	1430.0	204.0	-59.29	-59.16	0.6254	0.2439	0.4867	3631.0
130.0	0.01925	1250.0	186.0	-56.85	-56.72	0.6446	0.2429	0.4896	3413.0
135.0	0.01954	1100.0	170.0	-54.40	-54.27	0.6631	0.2404	0.4913	3225.0
140.0	0.01985	972.0	156.0	-51.94	-51.81	0.6810	0.2373	0.4929	3058.0
145.0	0.02018	862.0	143.0	-49.47	-49.34	0.6983	0.2343	0.4951	2905.0
150.0	0.02053	765.0	132.0	-46.99	-46.86	0.7152	0.2315	0.4982	2762.0
* 154.000	0.02083	695.0	124.0	-45.00	-44.87	0.7283	0.2296	0.5017	2653.0
* 154.000	1.552	49.7	0.265	25.54	35.60	1.251	0.1889	0.2863	590.5
155.0	1.565	50.2	0.263	25.75	35.89	1.253	0.1886	0.2852	593.1
160.0	1.629	52.7	0.251	26.75	37.31	1.262	0.1871	0.2807	605.4
165.0	1.691	55.2	0.240	27.74	38.70	1.271	0.1858	0.2769	617.3
170.0	1.753	57.5	0.230	28.72	40.08	1.279	0.1848	0.2737	628.8
175.0	1.814	60.0	0.221	29.68	41.44	1.287	0.1839	0.2711	640.0
180.0	1.874	62.3	0.213	30.64	42.79	1.294	0.1831	0.2688	650.8
185.0	1.934	64.6	0.206	31.59	44.13	1.302	0.1825	0.2668	661.4
190.0	1.994	66.8	0.199	32.53	45.46	1.309	0.1819	0.2651	671.7
200.0	2.112	71.2	0.187	34.41	48.10	1.322	0.1810	0.2624	691.7
205.0	2.170	73.4	0.182	35.34	49.40	1.329	0.1807	0.2612	701.4
210.0	2.229	75.6	0.177	36.26	50.71	1.335	0.1803	0.2602	710.8
215.0	2.287	77.7	0.172	37.19	52.01	1.341	0.1801	0.2593	720.2
220.0	2.344	79.8	0.168	38.11	53.30	1.347	0.1798	0.2586	729.3
225.0	2.402	82.0	0.163	39.02	54.59	1.353	0.1796	0.2578	738.4
230.0	2.459	84.1	0.159	39.94	55.88	1.359	0.1794	0.2572	747.2
235.0	2.517	86.2	0.156	40.85	57.16	1.364	0.1792	0.2566	756.0
240.0	2.574	88.2	0.152	41.77	58.45	1.370	0.1791	0.2561	764.6
245.0	2.631	90.3	0.148	42.68	59.73	1.375	0.1789	0.2556	773.1
250.0	2.687	92.4	0.145	43.58	61.00	1.380	0.1788	0.2552	781.5
255.0	2.744	94.4	0.142	44.49	62.28	1.385	0.1787	0.2548	789.7
260.0	2.801	96.5	0.139	45.40	63.55	1.390	0.1786	0.2544	797.9
265.0	2.857	98.5	0.136	46.30	64.82	1.395	0.1785	0.2541	806.0
270.0	2.914	101.0	0.134	47.21	66.09	1.400	0.1784	0.2538	814.0
275.0	2.970	103.0	0.131	48.11	67.36	1.404	0.1784	0.2535	821.8
280.0	3.026	105.0	0.128	49.01	68.63	1.409	0.1783	0.2532	829.6
285.0	3.083	107.0	0.126	49.91	69.89	1.413	0.1782	0.2530	837.3
290.0	3.139	109.0	0.124	50.81	71.16	1.418	0.1782	0.2527	845.0
295.0	3.195	111.0	0.122	51.71	72.42	1.422	0.1781	0.2525	852.5
300.0	3.251	113.0	0.119	52.61	73.68	1.426	0.1781	0.2523	860.0
310.0	3.363	117.0	0.115	54.41	76.20	1.435	0.1780	0.2520	874.7
320.0	3.474	121.0	0.112	56.20	78.72	1.443	0.1779	0.2517	889.2
330.0	3.586	125.0	0.108	57.99	81.24	1.450	0.1778	0.2514	903.4
340.0	3.697	129.0	0.105	59.79	83.75	1.458	0.1778	0.2512	917.4
350.0	3.809	133.0	0.102	61.57	86.26	1.465	0.1777	0.2509	931.1
360.0	3.920	136.0	0.0987	63.36	88.77	1.472	0.1777	0.2508	944.6
370.0	4.031	140.0	0.0959	65.15	91.27	1.479	0.1777	0.2506	957.9
380.0	4.142	144.0	0.0933	66.94	93.78	1.486	0.1776	0.2504	971.0
390.0	4.252	148.0	0.0908	68.72	96.28	1.492	0.1776	0.2503	983.9
400.0	4.363	152.0	0.0885	70.51	98.79	1.499	0.1776	0.2502	997.0
410.0	4.474	156.0	0.0863	72.29	101.3	1.505	0.1776	0.2500	1009.0
420.0	4.584	160.0	0.0842	74.07	103.8	1.511	0.1776	0.2499	1022.0
430.0	4.695	164.0	0.0822	75.86	105.3	1.517	0.1775	0.2498	1034.0
440.0	4.805	168.0	0.0803	77.64	108.8	1.522	0.1775	0.2498	1046.0
450.0	4.916	172.0	0.0784	79.42	111.3	1.528	0.1775	0.2497	1058.0
460.0	5.026	176.0	0.0767	81.20	113.8	1.533	0.1775	0.2496	1070.0
470.0	5.137	180.0	0.0750	82.98	116.3	1.539	0.1775	0.2495	1081.0
480.0	5.247	183.0	0.0735	84.76	118.8	1.544	0.1775	0.2495	1093.0
490.0	5.357	187.0	0.0719	86.54	121.3	1.549	0.1775	0.2494	1104.0
500.0	5.467	191.0	0.0705	88.32	123.8	1.554	0.1775	0.2494	1116.0
510.0	5.577	195.0	0.0691	90.10	126.2	1.559	0.1775	0.2493	1127.0
520.0	5.688	199.0	0.0677	91.88	128.7	1.564	0.1775	0.2493	1138.0
530.0	5.798	203.0	0.0664	93.66	131.2	1.569	0.1775	0.2493	1149.0
540.0	5.908	207.0	0.0652	95.44	133.7	1.573	0.1775	0.2493	1160.0
550.0	6.018	211.0	0.0640	97.22	136.2	1.578	0.1775	0.2492	1170.0
560.0	6.128	214.0	0.0628	99.00	138.7	1.583	0.1776	0.2492	1181.0
570.0	6.238	218.0	0.0617	100.8	141.2	1.587	0.1776	0.2492	1191.0
580.0	6.348	222.0	0.0606	102.6	143.7	1.591	0.1776	0.2492	1202.0
590.0	6.458	226.0	0.0596	104.3	146.2	1.596	0.1776	0.2492	1212.0
600.0	6.568	230.0	0.0586	106.1	148.7	1.600	0.1777	0.2492	1222.0
700.0	7.666	268.0	0.0502	123.9	173.6	1.638	0.1783	0.2496	1320.0
800.0	8.763	307.0	0.0438	141.8	198.6	1.672	0.1794	0.2507	1410.0
900.0	9.860	345.0	0.0390	159.9	223.8	1.701	0.1812	0.2524	1493.0
1000.0	10.96	384.0	0.0350	178.1	249.1	1.728	0.1835	0.2546	1571.0
1500.0	16.43	576.0	0.0233	273.6	380.1	1.834	0.1987	0.2697	1903.0
2000.0	21.91	767.0	0.0175	376.6	518.6	1.913	0.2125	0.2835	2178.0
2500.0	27.38	959.0	0.0140	485.5	662.9	1.978	0.2225	0.2934	2421.0
3000.0	32.85	1150.0	0.0117	598.5	811.4	2.032	0.2293	0.3002	2642.0
3500.0	38.32	1340.0	0.0100	714.4	962.8	2.079	0.2340	0.3050	2846.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

35 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DU)$_V$ PSIA-CU FT/BTU	-V(DP/DV)$_T$ PSIA	(DV/DT)/V$_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.02	195.0	19.9	104000.0	0.00241	0.0940	19.8	0.00370	1.46543	3.57
120.0	53.35	188.0	17.4	87700.0	0.00256	0.0909	16.8	0.00354	1.45903	3.20
125.0	52.65	179.0	15.9	75100.0	0.00271	0.0878	14.6	0.00343	1.45234	2.92
130.0	51.92	171.0	14.7	64800.0	0.00287	0.0846	13.1	0.00333	1.44537	2.72
135.0	51.16	163.0	13.8	56200.0	0.00302	0.0814	11.9	0.00324	1.43814	2.59
140.0	50.38	155.0	13.0	49000.0	0.00319	0.0783	10.9	0.00315	1.43065	2.47
145.0	49.56	147.0	12.4	42700.0	0.00336	0.0752	9.87	0.00306	1.42290	2.34
150.0	48.71	141.0	11.7	37300.0	0.00354	0.0721	9.10	0.00297	1.41490	2.26
* 154.000	48.02	135.0	11.2	33400.0	0.00370	0.0697	8.53	0.00289	1.40832	2.21
* 154.000	0.6444	34.5	2.13	32.0	0.00829	0.00499	0.405	0.0271	1.00486	0.837
155.0	0.6390	34.8	2.18	32.1	0.00813	0.00502	0.408	0.0275	1.00482	0.834
160.0	0.6140	36.3	2.18	32.4	0.00774	0.00516	0.419	0.0299	1.00463	0.821
165.0	0.5913	37.7	2.18	32.6	0.00735	0.00530	0.431	0.0324	1.00446	0.810
170.0	0.5705	39.1	2.18	32.9	0.00700	0.00545	0.443	0.0349	1.00430	0.801
175.0	0.5513	40.5	2.18	33.1	0.00670	0.00559	0.454	0.0374	1.00416	0.793
180.0	0.5335	41.8	2.18	33.2	0.00642	0.00573	0.466	0.0400	1.00402	0.787
185.0	0.5169	43.2	2.19	33.4	0.00618	0.00588	0.478	0.0426	1.00390	0.782
190.0	0.5015	44.6	2.19	33.5	0.00595	0.00602	0.490	0.0453	1.00378	0.777
200.0	0.4735	47.3	2.19	33.7	0.00555	0.00631	0.514	0.0508	1.00357	0.769
205.0	0.4607	48.6	2.19	33.8	0.00538	0.00645	0.526	0.0536	1.00347	0.766
210.0	0.4487	49.9	2.19	33.9	0.00521	0.00660	0.538	0.0565	1.00338	0.763
215.0	0.4373	51.2	2.18	34.0	0.00506	0.00674	0.549	0.0594	1.00330	0.761
220.0	0.4266	52.6	2.18	34.1	0.00492	0.00689	0.561	0.0624	1.00322	0.759
225.0	0.4163	53.9	2.18	34.1	0.00479	0.00703	0.573	0.0655	1.00314	0.757
230.0	0.4066	55.2	2.18	34.2	0.00466	0.00717	0.585	0.0686	1.00306	0.755
235.0	0.3974	56.5	2.18	34.2	0.00454	0.00732	0.596	0.0717	1.00300	0.753
240.0	0.3885	57.8	2.18	34.3	0.00443	0.00746	0.608	0.0750	1.00293	0.752
245.0	0.3801	59.1	2.18	34.3	0.00433	0.00760	0.620	0.0782	1.00287	0.750
250.0	0.3721	60.4	2.18	34.4	0.00423	0.00774	0.631	0.0815	1.00280	0.749
255.0	0.3644	61.7	2.18	34.4	0.00413	0.00788	0.643	0.0849	1.00275	0.748
260.0	0.3570	63.0	2.18	34.4	0.00404	0.00802	0.654	0.0883	1.00269	0.747
265.0	0.3500	64.3	2.18	34.5	0.00395	0.00816	0.665	0.0918	1.00264	0.746
270.0	0.3432	65.6	2.18	34.5	0.00387	0.00830	0.677	0.0953	1.00259	0.745
275.0	0.3367	66.8	2.18	34.5	0.00379	0.00844	0.688	0.0989	1.00254	0.744
280.0	0.3304	68.1	2.18	34.6	0.00372	0.00858	0.699	0.103	1.00249	0.743
285.0	0.3244	69.4	2.18	34.6	0.00364	0.00872	0.710	0.106	1.00244	0.742
290.0	0.3186	70.7	2.18	34.6	0.00358	0.00885	0.721	0.110	1.00240	0.741
295.0	0.3130	72.0	2.18	34.6	0.00351	0.00899	0.733	0.114	1.00236	0.741
300.0	0.3076	73.2	2.18	34.7	0.00344	0.00913	0.744	0.118	1.00232	0.740
310.0	0.2974	75.8	2.18	34.7	0.00332	0.00940	0.765	0.125	1.00224	0.739
320.0	0.2878	78.3	2.18	34.7	0.00321	0.00967	0.787	0.133	1.00217	0.737
330.0	0.2789	80.9	2.18	34.7	0.00311	0.00993	0.808	0.142	1.00210	0.736
340.0	0.2705	83.4	2.18	34.8	0.00301	0.0102	0.829	0.150	1.00204	0.735
350.0	0.2626	86.0	2.18	34.8	0.00292	0.0105	0.850	0.159	1.00198	0.734
360.0	0.2551	88.5	2.18	34.8	0.00283	0.0107	0.871	0.168	1.00192	0.733
370.0	0.2481	91.0	2.18	34.8	0.00275	0.0110	0.892	0.177	1.00187	0.733
380.0	0.2414	93.6	2.18	34.9	0.00268	0.0112	0.912	0.186	1.00182	0.732
390.0	0.2352	96.1	2.17	34.9	0.00261	0.0115	0.932	0.195	1.00177	0.731
400.0	0.2292	98.6	2.17	34.9	0.00254	0.0117	0.952	0.205	1.00173	0.730
410.0	0.2235	101.0	2.17	34.9	0.00247	0.0120	0.971	0.214	1.00168	0.730
420.0	0.2181	104.0	2.17	34.9	0.00241	0.0122	0.991	0.224	1.00164	0.729
430.0	0.2130	106.0	2.17	34.9	0.00235	0.0125	1.01	0.234	1.00160	0.729
440.0	0.2081	109.0	2.17	34.9	0.00230	0.0127	1.03	0.245	1.00157	0.728
450.0	0.2034	111.0	2.17	34.9	0.00225	0.0130	1.05	0.255	1.00153	0.727
460.0	0.1990	114.0	2.17	34.9	0.00220	0.0132	1.07	0.266	1.00150	0.727
470.0	0.1947	116.0	2.17	34.9	0.00215	0.0134	1.09	0.276	1.00147	0.726
480.0	0.1906	119.0	2.17	35.0	0.00210	0.0137	1.10	0.287	1.00144	0.726
490.0	0.1867	121.0	2.17	35.0	0.00206	0.0139	1.12	0.298	1.00141	0.726
500.0	0.1829	124.0	2.17	35.0	0.00202	0.0141	1.14	0.310	1.00138	0.725
510.0	0.1793	126.0	2.17	35.0	0.00197	0.0143	1.16	0.321	1.00135	0.725
520.0	0.1758	129.0	2.17	35.0	0.00194	0.0146	1.18	0.332	1.00132	0.724
530.0	0.1725	131.0	2.17	35.0	0.00190	0.0148	1.19	0.344	1.00130	0.724
540.0	0.1693	134.0	2.17	35.0	0.00186	0.0150	1.21	0.356	1.00128	0.723
550.0	0.1662	136.0	2.17	35.0	0.00183	0.0152	1.23	0.368	1.00125	0.723
560.0	0.1632	139.0	2.17	35.0	0.00180	0.0155	1.25	0.380	1.00123	0.723
570.0	0.1603	141.0	2.17	35.0	0.00176	0.0157	1.26	0.392	1.00121	0.722
580.0	0.1575	144.0	2.17	35.0	0.00173	0.0159	1.28	0.405	1.00119	0.722
590.0	0.1549	146.0	2.17	35.0	0.00170	0.0161	1.30	0.418	1.00117	0.722
600.0	0.1523	149.0	2.17	35.0	0.00167	0.0163	1.31	0.430	1.00115	0.721
700.0	0.1304	174.0	2.16	35.0	0.00143	0.0184	1.47	0.565	1.00098	0.718
800.0	0.1141	200.0	2.14	35.0	0.00125	0.0204	1.62	0.714	1.00086	0.716
900.0	0.1014	227.0	2.12	35.0	0.00111	0.0224	1.76	0.874	1.00076	0.715
1000.0	0.09127	255.0	2.09	35.0	0.00100	0.0243	1.89	1.05	1.00069	0.714
1500.0	0.06083	405.0	1.93	35.0	0.000666					
2000.0	0.04565	567.0	1.80	35.0	0.000500					
2500.0	0.03652	734.0	1.72	35.0	0.000400					
3000.0	0.03044	901.0	1.67	35.0	0.000333					
3500.0	0.02603	1070.0	1.64	35.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

40 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01851	1920.0	250.0	-64.09	-63.95	0.5854	0.2328	0.4703	4236.0
120.0	0.01874	1650.0	225.0	-61.71	-61.57	0.6056	0.2417	0.4810	3895.0
125.0	0.01893	1430.0	204.0	-59.29	-59.15	0.6254	0.2440	0.4866	3631.0
130.0	0.01925	1250.0	186.0	-56.85	-56.71	0.6445	0.2430	0.4895	3413.0
135.0	0.01954	1100.0	170.0	-54.40	-54.26	0.6630	0.2405	0.4912	3226.0
140.0	0.01985	973.0	156.0	-51.95	-51.80	0.6809	0.2374	0.4928	3059.0
145.0	0.02013	863.0	143.0	-49.48	-49.33	0.6983	0.2344	0.4949	2906.0
150.0	0.02053	766.0	132.0	-47.00	-46.85	0.7151	0.2316	0.4981	2763.0
155.0	0.02090	679.0	122.0	-44.50	-44.35	0.7315	0.2292	0.5025	2627.0
* 156.500	0.02103	654.0	119.0	-43.72	-43.57	0.7365	0.2286	0.5043	2586.0
* 156.500	1.369	49.6	0.303	25.81	35.95	1.245	0.1899	0.2904	592.7
160.0	1.408	51.4	0.293	26.51	36.94	1.251	0.1887	0.2867	601.5
165.0	1.464	54.0	0.280	27.52	38.36	1.260	0.1872	0.2820	613.8
170.0	1.519	56.5	0.268	28.51	39.77	1.268	0.1860	0.2782	625.6
175.0	1.574	58.9	0.257	29.49	41.15	1.276	0.1849	0.2750	637.0
180.0	1.628	61.3	0.247	30.46	42.52	1.284	0.1840	0.2723	648.1
185.0	1.681	63.6	0.239	31.42	43.87	1.291	0.1833	0.2699	658.9
190.0	1.734	65.9	0.231	32.37	45.22	1.299	0.1826	0.2679	669.4
200.0	1.838	70.4	0.216	34.26	47.88	1.312	0.1816	0.2647	689.7
205.0	1.890	72.7	0.210	35.20	49.20	1.319	0.1812	0.2633	699.5
210.0	1.941	74.9	0.204	36.13	50.51	1.325	0.1808	0.2621	709.2
215.0	1.992	77.0	0.198	37.06	51.82	1.331	0.1805	0.2611	718.6
220.0	2.043	79.2	0.193	37.99	53.12	1.337	0.1802	0.2602	727.9
225.0	2.094	81.3	0.188	38.91	54.42	1.343	0.1799	0.2593	737.0
230.0	2.145	83.5	0.183	39.83	55.72	1.349	0.1797	0.2586	746.0
235.0	2.195	85.6	0.179	40.75	57.01	1.354	0.1795	0.2579	754.8
240.0	2.245	87.7	0.175	41.66	58.29	1.360	0.1793	0.2573	763.5
245.0	2.295	89.8	0.171	42.58	59.58	1.365	0.1792	0.2567	772.1
250.0	2.345	91.9	0.167	43.49	60.86	1.370	0.1790	0.2562	780.5
255.0	2.395	94.0	0.163	44.40	62.14	1.375	0.1789	0.2558	788.8
260.0	2.445	96.0	0.160	45.31	63.42	1.380	0.1788	0.2553	797.1
265.0	2.495	98.1	0.156	46.22	64.70	1.385	0.1787	0.2549	805.2
270.0	2.544	100.0	0.153	47.12	65.97	1.390	0.1786	0.2546	813.2
275.0	2.594	102.0	0.150	48.03	67.24	1.395	0.1785	0.2543	821.2
280.0	2.643	104.0	0.147	48.93	68.51	1.399	0.1784	0.2540	829.0
285.0	2.693	106.0	0.145	49.84	69.78	1.404	0.1784	0.2537	836.8
290.0	2.742	108.0	0.142	50.74	71.05	1.408	0.1783	0.2534	844.4
295.0	2.791	110.0	0.139	51.64	72.31	1.412	0.1782	0.2532	852.0
300.0	2.840	112.0	0.137	52.54	73.58	1.417	0.1782	0.2529	859.5
310.0	2.939	116.0	0.132	54.34	76.11	1.425	0.1781	0.2525	874.3
320.0	3.037	120.0	0.128	56.14	78.63	1.433	0.1780	0.2522	888.8
330.0	3.135	124.0	0.124	57.93	81.15	1.441	0.1779	0.2519	903.1
340.0	3.232	128.0	0.120	59.73	83.67	1.448	0.1779	0.2516	917.1
350.0	3.330	132.0	0.116	61.52	86.18	1.455	0.1778	0.2513	930.9
360.0	3.427	136.0	0.113	63.31	88.70	1.463	0.1778	0.2511	944.4
370.0	3.525	140.0	0.110	65.10	91.21	1.469	0.1777	0.2509	957.8
380.0	3.622	144.0	0.107	66.89	93.71	1.476	0.1777	0.2507	970.9
390.0	3.719	148.0	0.104	68.67	96.22	1.483	0.1777	0.2506	983.8
400.0	3.816	152.0	0.101	70.46	98.73	1.489	0.1776	0.2504	997.0
410.0	3.913	156.0	0.0988	72.25	101.2	1.495	0.1776	0.2503	1009.0
420.0	4.010	160.0	0.0963	74.03	103.7	1.501	0.1776	0.2502	1022.0
430.0	4.107	164.0	0.0940	75.81	106.2	1.507	0.1776	0.2501	1034.0
440.0	4.204	168.0	0.0919	77.60	108.7	1.513	0.1776	0.2500	1046.0
450.0	4.300	172.0	0.0898	79.38	111.2	1.518	0.1775	0.2499	1058.0
460.0	4.397	176.0	0.0878	81.16	113.7	1.524	0.1775	0.2498	1070.0
470.0	4.494	179.0	0.0859	82.94	116.2	1.529	0.1775	0.2497	1081.0
480.0	4.590	183.0	0.0840	84.73	118.7	1.535	0.1775	0.2497	1093.0
490.0	4.687	187.0	0.0823	86.51	121.2	1.540	0.1775	0.2496	1104.0
500.0	4.783	191.0	0.0806	88.29	123.7	1.545	0.1775	0.2495	1116.0
510.0	4.880	195.0	0.0790	90.07	126.2	1.550	0.1775	0.2495	1127.0
520.0	4.976	199.0	0.0775	91.85	128.7	1.555	0.1775	0.2495	1138.0
530.0	5.073	203.0	0.0760	93.63	131.2	1.559	0.1775	0.2494	1149.0
540.0	5.169	207.0	0.0745	95.41	133.7	1.564	0.1775	0.2494	1160.0
550.0	5.265	211.0	0.0732	97.19	136.2	1.568	0.1776	0.2494	1170.0
560.0	5.362	214.0	0.0718	98.97	138.7	1.573	0.1776	0.2493	1181.0
570.0	5.458	218.0	0.0706	100.7	141.2	1.577	0.1776	0.2493	1192.0
580.0	5.554	222.0	0.0693	102.5	143.7	1.582	0.1776	0.2493	1202.0
590.0	5.651	226.0	0.0681	104.3	146.2	1.586	0.1777	0.2493	1212.0
600.0	5.747	230.0	0.0670	106.1	148.7	1.590	0.1777	0.2493	1223.0
700.0	6.708	269.0	0.0573	123.9	173.6	1.629	0.1783	0.2497	1320.0
800.0	7.669	307.0	0.0501	141.8	198.6	1.662	0.1795	0.2507	1410.0
900.0	8.629	346.0	0.0445	159.9	223.8	1.692	0.1812	0.2524	1493.0
1000.0	9.588	384.0	0.0401	178.1	249.1	1.718	0.1835	0.2547	1571.0
1500.0	14.38	576.0	0.0267	273.6	380.1	1.824	0.1987	0.2697	1903.0
2000.0	19.17	767.0	0.0200	376.6	518.6	1.904	0.2125	0.2835	2178.0
2500.0	23.96	959.0	0.0160	485.5	662.9	1.968	0.2225	0.2934	2421.0
3000.0	28.75	1150.0	0.0133	598.5	811.5	2.022	0.2293	0.3002	2642.0
3500.0	33.54	1340.0	0.0114	714.4	962.8	2.069	0.2340	0.3050	2847.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

40 PSIA 1508AR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.02	195.0	19.9	104000.0	0.00241	0.0941	19.8	0.00370	1.46546	3.57
120.0	53.35	188.0	17.4	87800.0	0.00256	0.0909	16.8	0.00354	1.45916	3.20
125.0	52.66	180.0	15.8	75100.0	0.00271	0.0878	14.6	0.00343	1.45237	2.92
130.0	51.93	171.0	14.7	64800.0	0.00286	0.0846	13.1	0.00333	1.44541	2.72
135.0	51.17	163.0	13.8	56200.0	0.00302	0.0815	11.9	0.00324	1.43818	2.59
140.0	50.38	155.0	13.0	49000.0	0.00318	0.0783	10.9	0.00315	1.43070	2.47
145.0	49.57	148.0	12.3	42800.0	0.00335	0.0752	9.87	0.00307	1.42296	2.34
150.0	48.72	141.0	11.7	37300.0	0.00354	0.0721	9.11	0.00297	1.41496	2.26
155.0	47.84	134.0	11.1	32500.0	0.00374	0.0691	8.39	0.00287	1.40668	2.20
* 156.500	47.56	132.0	10.9	31100.0	0.00381	0.0681	8.18	0.00284	1.40405	2.18
* 156.500	0.7304	34.7	2.18	36.2	0.00836	0.00511	0.414	0.0241	1.00551	0.847
160.0	0.7101	35.7	2.19	36.5	0.00802	0.00520	0.421	0.0256	1.00536	0.836
165.0	0.6829	37.2	2.19	36.9	0.00758	0.00534	0.433	0.0277	1.00515	0.823
170.0	0.6581	38.6	2.19	37.2	0.00720	0.00548	0.445	0.0299	1.00496	0.812
175.0	0.6354	40.0	2.19	37.4	0.00687	0.00563	0.456	0.0322	1.00479	0.803
180.0	0.6144	41.4	2.19	37.7	0.00657	0.00577	0.468	0.0345	1.00463	0.796
185.0	0.5949	42.8	2.19	37.9	0.00630	0.00591	0.480	0.0368	1.00449	0.789
190.0	0.5768	44.2	2.19	38.0	0.00606	0.00605	0.492	0.0392	1.00435	0.784
200.0	0.5441	46.9	2.19	38.3	0.00564	0.00634	0.516	0.0440	1.00410	0.775
205.0	0.5292	48.3	2.19	38.5	0.00545	0.00648	0.527	0.0465	1.00399	0.771
210.0	0.5152	49.6	2.19	38.6	0.00529	0.00663	0.539	0.0491	1.00388	0.768
215.0	0.5019	50.9	2.19	38.7	0.00513	0.00677	0.551	0.0517	1.00378	0.765
220.0	0.4894	52.3	2.19	38.8	0.00498	0.00691	0.563	0.0543	1.00369	0.762
225.0	0.4776	53.6	2.19	38.8	0.00484	0.00706	0.574	0.0570	1.00360	0.760
230.0	0.4663	54.9	2.19	38.9	0.00471	0.00720	0.586	0.0597	1.00352	0.758
235.0	0.4556	56.2	2.19	39.0	0.00459	0.00734	0.598	0.0625	1.00343	0.756
240.0	0.4454	57.5	2.19	39.1	0.00447	0.00748	0.609	0.0653	1.00336	0.754
245.0	0.4357	58.8	2.19	39.1	0.00436	0.00762	0.621	0.0682	1.00328	0.753
250.0	0.4264	60.2	2.19	39.2	0.00426	0.00776	0.632	0.0711	1.00321	0.751
255.0	0.4175	61.5	2.19	39.2	0.00416	0.00790	0.644	0.0740	1.00315	0.750
260.0	0.4090	62.8	2.19	39.3	0.00407	0.00804	0.655	0.0770	1.00308	0.749
265.0	0.4008	64.1	2.18	39.3	0.00398	0.00818	0.667	0.0801	1.00302	0.748
270.0	0.3930	65.3	2.18	39.4	0.00390	0.00832	0.678	0.0832	1.00296	0.747
275.0	0.3855	66.6	2.18	39.4	0.00382	0.00846	0.689	0.0863	1.00291	0.746
280.0	0.3783	67.9	2.18	39.4	0.00374	0.00860	0.700	0.0895	1.00285	0.745
285.0	0.3714	69.2	2.18	39.5	0.00366	0.00874	0.711	0.0927	1.00280	0.744
290.0	0.3647	70.5	2.18	39.5	0.00359	0.00887	0.723	0.0960	1.00275	0.743
295.0	0.3583	71.8	2.18	39.5	0.00353	0.00901	0.734	0.0993	1.00270	0.742
300.0	0.3521	73.1	2.18	39.5	0.00346	0.00915	0.745	0.103	1.00265	0.741
310.0	0.3403	75.6	2.18	39.6	0.00334	0.00942	0.766	0.110	1.00256	0.740
320.0	0.3293	78.2	2.18	39.6	0.00322	0.00969	0.788	0.117	1.00248	0.739
330.0	0.3190	80.7	2.18	39.7	0.00312	0.0100	0.809	0.124	1.00240	0.737
340.0	0.3094	83.3	2.18	39.7	0.00302	0.0102	0.830	0.131	1.00233	0.736
350.0	0.3003	85.8	2.18	39.7	0.00293	0.0105	0.851	0.139	1.00226	0.735
360.0	0.2918	88.4	2.18	39.8	0.00284	0.0107	0.872	0.147	1.00220	0.734
370.0	0.2837	90.9	2.18	39.8	0.00276	0.0110	0.892	0.154	1.00214	0.733
380.0	0.2761	93.4	2.18	39.8	0.00268	0.0112	0.913	0.162	1.00208	0.733
390.0	0.2689	96.0	2.18	39.8	0.00261	0.0115	0.933	0.171	1.00203	0.732
400.0	0.2621	98.5	2.18	39.8	0.00254	0.0117	0.953	0.179	1.00197	0.731
410.0	0.2556	101.0	2.18	39.9	0.00248	0.0120	0.972	0.189	1.00193	0.730
420.0	0.2494	104.0	2.18	39.9	0.00242	0.0122	0.992	0.196	1.00188	0.730
430.0	0.2435	106.0	2.18	39.9	0.00236	0.0125	1.01	0.205	1.00183	0.729
440.0	0.2379	109.0	2.17	39.9	0.00230	0.0127	1.03	0.214	1.00179	0.728
450.0	0.2325	111.0	2.17	39.9	0.00225	0.0130	1.05	0.223	1.00175	0.728
460.0	0.2274	114.0	2.17	39.9	0.00220	0.0132	1.07	0.232	1.00171	0.727
470.0	0.2225	116.0	2.17	39.9	0.00215	0.0134	1.09	0.242	1.00168	0.727
480.0	0.2179	119.0	2.17	39.9	0.00210	0.0137	1.10	0.251	1.00164	0.726
490.0	0.2134	121.0	2.17	40.0	0.00206	0.0139	1.12	0.261	1.00161	0.726
500.0	0.2091	124.0	2.17	40.0	0.00202	0.0141	1.14	0.271	1.00157	0.725
510.0	0.2049	126.0	2.17	40.0	0.00193	0.0144	1.16	0.281	1.00154	0.725
520.0	0.2010	129.0	2.17	40.0	0.00194	0.0146	1.18	0.291	1.00151	0.725
530.0	0.1971	131.0	2.17	40.0	0.00190	0.0148	1.19	0.301	1.00149	0.724
540.0	0.1935	134.0	2.17	40.0	0.00186	0.0150	1.21	0.312	1.00146	0.724
550.0	0.1899	136.0	2.17	40.0	0.00183	0.0153	1.23	0.322	1.00143	0.723
560.0	0.1865	139.0	2.17	40.0	0.00180	0.0155	1.25	0.333	1.00140	0.723
570.0	0.1832	141.0	2.17	40.0	0.00176	0.0157	1.26	0.343	1.00138	0.723
580.0	0.1800	144.0	2.17	40.0	0.00173	0.0159	1.28	0.354	1.00136	0.722
590.0	0.1770	146.0	2.17	40.0	0.00170	0.0161	1.30	0.365	1.00133	0.722
600.0	0.1740	149.0	2.17	40.0	0.00167	0.0163	1.31	0.377	1.00131	0.722
700.0	0.1491	174.0	2.16	40.0	0.00143	0.0184	1.47	0.495	1.00112	0.719
800.0	0.1304	200.0	2.14	40.0	0.00125	0.0204	1.62	0.625	1.00098	0.716
900.0	0.1159	227.0	2.12	40.0	0.00111	0.0224	1.76	0.765	1.00087	0.715
1000.0	0.1043	255.0	2.09	40.0	0.00100	0.0243	1.89	0.915	1.00079	0.714
1500.0	0.06954	405.0	1.93	40.0	0.000666					
2000.0	0.05216	567.0	1.80	40.0	0.000500					
2500.0	0.04174	734.0	1.72	40.0	0.000400					
3000.0	0.03479	901.0	1.67	40.0	0.000333					
3500.0	0.02982	1070.0	1.64	40.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

45 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01851	1920.0	250.0	-64.10	-63.94	0.5853	0.2330	0.4702	4235.0
120.0	0.01874	1650.0	225.0	-61.72	-61.56	0.6056	0.2418	0.4810	3895.0
125.0	0.01893	1430.0	204.0	-59.30	-59.14	0.6253	0.2441	0.4865	3631.0
130.0	0.01925	1250.0	186.0	-56.86	-56.70	0.6445	0.2431	0.4894	3413.0
135.0	0.01954	1100.0	170.0	-54.41	-54.25	0.6630	0.2406	0.4911	3226.0
140.0	0.01985	974.0	156.0	-51.95	-51.79	0.6809	0.2375	0.4927	3059.0
145.0	0.02017	864.0	143.0	-49.49	-49.32	0.6982	0.2344	0.4948	2907.0
150.0	0.02052	767.0	132.0	-47.01	-46.84	0.7150	0.2317	0.4979	2764.0
155.0	0.02090	680.0	122.0	-44.51	-44.34	0.7314	0.2293	0.5024	2628.0
* 158.900	0.02121	618.0	114.0	-42.55	-42.38	0.7439	0.2277	0.5070	2525.0
* 158.900	1.225	49.4	0.341	26.03	36.24	1.239	0.1908	0.2945	594.5
160.0	1.237	50.0	0.337	26.26	36.57	1.241	0.1904	0.2931	597.4
165.0	1.288	52.7	0.321	27.29	38.02	1.250	0.1886	0.2875	610.1
170.0	1.338	55.3	0.307	28.30	39.45	1.259	0.1872	0.2830	622.3
175.0	1.387	57.8	0.294	29.29	40.85	1.267	0.1860	0.2791	634.0
180.0	1.435	60.3	0.282	30.28	42.24	1.275	0.1850	0.2759	645.4
185.0	1.483	62.7	0.272	31.25	43.61	1.282	0.1841	0.2732	656.4
190.0	1.531	65.0	0.263	32.21	44.97	1.289	0.1834	0.2708	667.1
200.0	1.625	69.7	0.246	34.12	47.66	1.303	0.1822	0.2670	687.7
205.0	1.671	71.9	0.238	35.06	48.99	1.310	0.1817	0.2654	697.7
210.0	1.717	74.2	0.231	36.00	50.31	1.316	0.1813	0.2641	707.5
215.0	1.763	76.4	0.225	36.94	51.63	1.322	0.1809	0.2629	717.0
220.0	1.809	78.6	0.219	37.87	52.94	1.328	0.1806	0.2618	726.4
225.0	1.854	80.7	0.213	38.80	54.25	1.334	0.1803	0.2608	735.6
230.0	1.900	82.9	0.208	39.72	55.55	1.340	0.1800	0.2600	744.7
235.0	1.945	85.0	0.203	40.64	56.85	1.345	0.1798	0.2592	753.6
240.0	1.990	87.2	0.198	41.56	58.14	1.351	0.1796	0.2585	762.4
245.0	2.035	89.3	0.193	42.48	59.43	1.356	0.1794	0.2578	771.0
250.0	2.079	91.4	0.189	43.39	60.72	1.361	0.1793	0.2573	779.5
255.0	2.124	93.5	0.185	44.31	62.01	1.367	0.1791	0.2567	787.9
260.0	2.168	95.6	0.181	45.22	63.29	1.372	0.1790	0.2563	796.2
265.0	2.213	97.7	0.177	46.13	64.57	1.376	0.1789	0.2558	804.4
270.0	2.257	100.0	0.173	47.04	65.85	1.381	0.1788	0.2554	812.5
275.0	2.301	102.0	0.170	47.95	67.12	1.386	0.1787	0.2550	820.5
280.0	2.345	104.0	0.166	48.85	68.40	1.390	0.1786	0.2547	828.4
285.0	2.389	106.0	0.163	49.76	69.67	1.395	0.1785	0.2544	836.2
290.0	2.433	108.0	0.160	50.66	70.94	1.399	0.1784	0.2541	843.9
295.0	2.477	110.0	0.157	51.57	72.21	1.404	0.1784	0.2538	851.5
300.0	2.521	112.0	0.154	52.47	73.48	1.408	0.1783	0.2535	859.0
310.0	2.609	116.0	0.149	54.27	76.01	1.416	0.1782	0.2531	873.9
320.0	2.696	120.0	0.144	56.07	78.54	1.424	0.1781	0.2527	888.5
330.0	2.783	124.0	0.140	57.87	81.07	1.432	0.1780	0.2523	902.8
340.0	2.870	128.0	0.135	59.67	83.59	1.440	0.1779	0.2520	916.9
350.0	2.957	132.0	0.131	61.46	86.11	1.447	0.1779	0.2517	930.7
360.0	3.044	136.0	0.127	63.26	88.62	1.454	0.1778	0.2515	944.3
370.0	3.131	140.0	0.124	65.05	91.14	1.461	0.1778	0.2513	957.6
380.0	3.217	144.0	0.120	66.84	93.65	1.468	0.1777	0.2511	970.8
390.0	3.304	148.0	0.117	68.63	96.16	1.474	0.1777	0.2509	983.8
400.0	3.390	152.0	0.114	70.41	98.67	1.480	0.1777	0.2507	997.0
410.0	3.477	156.0	0.111	72.20	101.2	1.487	0.1777	0.2506	1009.0
420.0	3.563	160.0	0.109	73.99	103.7	1.493	0.1776	0.2504	1022.0
430.0	3.649	164.0	0.106	75.77	106.2	1.499	0.1776	0.2503	1034.0
440.0	3.735	168.0	0.103	77.56	108.7	1.504	0.1776	0.2502	1046.0
450.0	3.821	172.0	0.101	79.34	111.2	1.510	0.1776	0.2501	1058.0
460.0	3.907	175.0	0.0989	81.12	113.7	1.515	0.1776	0.2500	1070.0
470.0	3.993	179.0	0.0967	82.91	116.2	1.521	0.1776	0.2499	1082.0
480.0	4.079	183.0	0.0946	84.69	118.7	1.526	0.1775	0.2498	1093.0
490.0	4.165	187.0	0.0927	86.47	121.2	1.531	0.1775	0.2498	1105.0
500.0	4.251	191.0	0.0908	88.25	123.7	1.536	0.1775	0.2497	1116.0
510.0	4.337	195.0	0.0890	90.03	126.2	1.541	0.1775	0.2497	1127.0
520.0	4.423	199.0	0.0872	91.82	128.7	1.546	0.1775	0.2496	1138.0
530.0	4.509	203.0	0.0855	93.60	131.2	1.551	0.1776	0.2496	1149.0
540.0	4.594	207.0	0.0839	95.38	133.7	1.556	0.1776	0.2495	1160.0
550.0	4.680	211.0	0.0824	97.16	136.2	1.560	0.1776	0.2495	1171.0
560.0	4.766	214.0	0.0809	98.94	138.7	1.565	0.1776	0.2495	1181.0
570.0	4.851	218.0	0.0794	100.7	141.1	1.569	0.1776	0.2495	1192.0
580.0	4.937	222.0	0.0781	102.5	143.6	1.573	0.1776	0.2494	1202.0
590.0	5.023	226.0	0.0767	104.3	146.1	1.578	0.1777	0.2494	1213.0
600.0	5.108	230.0	0.0754	106.1	148.6	1.582	0.1777	0.2494	1223.0
700.0	5.964	269.0	0.0645	123.9	173.6	1.620	0.1783	0.2498	1320.0
800.0	6.818	307.0	0.0564	141.8	198.6	1.654	0.1795	0.2508	1410.0
900.0	7.671	346.0	0.0501	159.8	223.8	1.683	0.1812	0.2525	1494.0
1000.0	8.524	384.0	0.0451	178.1	249.1	1.710	0.1835	0.2547	1571.0
1500.0	12.78	576.0	0.0300	273.6	380.1	1.816	0.1987	0.2697	1903.0
2000.0	17.04	768.0	0.0225	376.6	518.5	1.896	0.2125	0.2835	2178.0
2500.0	21.30	959.0	0.0180	485.5	663.0	1.960	0.2225	0.2934	2421.0
3000.0	25.56	1150.0	0.0150	598.5	811.5	2.014	0.2293	0.3002	2642.0
3500.0	29.81	1340.0	0.0129	714.4	962.8	2.061	0.2340	0.3050	2847.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

45 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.02	195.0	19.8	104000.0	0.00241	0.0941	19.8	0.00370	1.46548	3.57
120.0	53.36	188.0	17.4	87800.0	0.00256	0.0910	16.8	0.00354	1.45909	3.21
125.0	52.66	180.0	15.8	75200.0	0.00271	0.0878	14.6	0.00343	1.45240	2.92
130.0	51.93	171.0	14.7	64900.0	0.00286	0.0846	13.1	0.00333	1.44545	2.72
135.0	51.17	163.0	13.8	56300.0	0.00302	0.0815	11.9	0.00324	1.43822	2.59
140.0	50.39	155.0	13.0	49100.0	0.00318	0.0783	10.9	0.00316	1.43074	2.47
145.0	49.57	148.0	12.3	42800.0	0.00335	0.0752	9.88	0.00307	1.42301	2.34
150.0	48.73	141.0	11.7	37400.0	0.00353	0.0721	9.11	0.00297	1.41502	2.26
155.0	47.85	134.0	11.1	32500.0	0.00374	0.0691	8.40	0.00287	1.40675	2.20
* 158.900	47.14	129.0	10.6	29100.0	0.00392	0.0667	7.87	0.00279	1.40010	2.15
* 158.900	0.8162	34.9	2.19	40.3	0.00844	0.00521	0.421	0.0217	1.00616	0.856
160.0	0.8087	35.2	2.19	40.5	0.00833	0.00524	0.424	0.0221	1.00610	0.852
165.0	0.7767	36.7	2.19	40.9	0.00784	0.00538	0.435	0.0241	1.00586	0.837
170.0	0.7476	38.2	2.19	41.3	0.00742	0.00552	0.447	0.0261	1.00564	0.824
175.0	0.7211	39.6	2.19	41.7	0.00705	0.00566	0.458	0.0281	1.00544	0.813
180.0	0.6967	41.0	2.19	42.0	0.00673	0.00580	0.470	0.0302	1.00526	0.805
185.0	0.6741	42.4	2.19	42.3	0.00644	0.00594	0.482	0.0323	1.00509	0.797
190.0	0.6532	43.8	2.19	42.5	0.00618	0.00609	0.494	0.0344	1.00493	0.791
200.0	0.6155	46.6	2.19	42.9	0.00573	0.00637	0.517	0.0388	1.00464	0.780
205.0	0.5984	47.9	2.19	43.0	0.00554	0.00651	0.529	0.0410	1.00451	0.776
210.0	0.5823	49.3	2.19	43.2	0.00536	0.00666	0.541	0.0433	1.00439	0.772
215.0	0.5671	50.6	2.19	43.3	0.00519	0.00680	0.553	0.0456	1.00428	0.769
220.0	0.5528	52.0	2.19	43.4	0.00504	0.00694	0.564	0.0480	1.00417	0.766
225.0	0.5393	53.3	2.19	43.5	0.00489	0.00708	0.576	0.0504	1.00407	0.763
230.0	0.5264	54.6	2.19	43.6	0.00476	0.00722	0.588	0.0528	1.00397	0.761
235.0	0.5142	56.0	2.19	43.7	0.00463	0.00737	0.599	0.0553	1.00388	0.759
240.0	0.5026	57.3	2.19	43.8	0.00451	0.00751	0.611	0.0578	1.00379	0.757
245.0	0.4915	58.6	2.19	43.9	0.00440	0.00765	0.622	0.0603	1.00371	0.755
250.0	0.4809	59.9	2.19	44.0	0.00429	0.00779	0.634	0.0629	1.00363	0.754
255.0	0.4708	61.2	2.19	44.0	0.00419	0.00793	0.645	0.0656	1.00355	0.752
260.0	0.4612	62.5	2.19	44.1	0.00410	0.00807	0.657	0.0683	1.00348	0.751
265.0	0.4519	63.8	2.19	44.1	0.00401	0.00821	0.668	0.0710	1.00341	0.750
270.0	0.4431	65.1	2.19	44.2	0.00392	0.00834	0.679	0.0737	1.00334	0.748
275.0	0.4346	66.4	2.19	44.2	0.00384	0.00848	0.690	0.0765	1.00328	0.747
280.0	0.4264	67.7	2.19	44.3	0.00376	0.00862	0.702	0.0794	1.00321	0.746
285.0	0.4185	69.0	2.19	44.3	0.00368	0.00876	0.713	0.0823	1.00315	0.745
290.0	0.4109	70.3	2.19	44.4	0.00361	0.00889	0.724	0.0852	1.00310	0.744
295.0	0.4037	71.6	2.19	44.4	0.00354	0.00903	0.735	0.0881	1.00304	0.743
300.0	0.3966	72.9	2.18	44.4	0.00348	0.00917	0.746	0.0911	1.00299	0.743
310.0	0.3833	75.5	2.18	44.5	0.00335	0.00944	0.767	0.0973	1.00289	0.741
320.0	0.3709	78.0	2.18	44.5	0.00324	0.00970	0.789	0.104	1.00280	0.740
330.0	0.3593	80.6	2.18	44.6	0.00313	0.0100	0.810	0.110	1.00271	0.738
340.0	0.3484	83.2	2.18	44.6	0.00303	0.0102	0.831	0.117	1.00263	0.737
350.0	0.3381	85.7	2.18	44.7	0.00294	0.0105	0.852	0.123	1.00255	0.736
360.0	0.3285	88.3	2.18	44.7	0.00285	0.0108	0.873	0.130	1.00248	0.735
370.0	0.3194	90.8	2.18	44.7	0.00277	0.0110	0.893	0.137	1.00241	0.734
380.0	0.3108	93.3	2.18	44.8	0.00269	0.0113	0.913	0.144	1.00234	0.733
390.0	0.3027	95.9	2.18	44.8	0.00262	0.0115	0.934	0.152	1.00228	0.732
400.0	0.2950	98.4	2.18	44.8	0.00255	0.0118	0.953	0.159	1.00222	0.732
410.0	0.2876	101.0	2.18	44.8	0.00248	0.0120	0.973	0.167	1.00217	0.731
420.0	0.2807	103.0	2.18	44.8	0.00242	0.0123	0.992	0.174	1.00211	0.730
430.0	0.2740	106.0	2.18	44.9	0.00236	0.0125	1.01	0.182	1.00206	0.730
440.0	0.2677	109.0	2.18	44.9	0.00231	0.0127	1.03	0.190	1.00202	0.729
450.0	0.2617	111.0	2.18	44.9	0.00225	0.0130	1.05	0.198	1.00197	0.728
460.0	0.2559	114.0	2.18	44.9	0.00220	0.0132	1.07	0.207	1.00193	0.728
470.0	0.2504	116.0	2.17	44.9	0.00215	0.0134	1.09	0.215	1.00189	0.727
480.0	0.2451	119.0	2.17	44.9	0.00211	0.0137	1.11	0.223	1.00185	0.727
490.0	0.2401	121.0	2.17	44.9	0.00206	0.0139	1.12	0.232	1.00181	0.726
500.0	0.2352	124.0	2.17	44.9	0.00202	0.0141	1.14	0.241	1.00177	0.726
510.0	0.2306	126.0	2.17	45.0	0.00198	0.0144	1.16	0.250	1.00174	0.725
520.0	0.2261	129.0	2.17	45.0	0.00194	0.0146	1.18	0.259	1.00170	0.725
530.0	0.2218	131.0	2.17	45.0	0.00190	0.0148	1.19	0.268	1.00167	0.724
540.0	0.2177	134.0	2.17	45.0	0.00187	0.0150	1.21	0.277	1.00164	0.724
550.0	0.2137	136.0	2.17	45.0	0.00183	0.0153	1.23	0.286	1.00161	0.724
560.0	0.2098	139.0	2.17	45.0	0.00180	0.0155	1.25	0.296	1.00158	0.723
570.0	0.2061	141.0	2.17	45.0	0.00177	0.0157	1.26	0.305	1.00155	0.723
580.0	0.2025	144.0	2.17	45.0	0.00173	0.0159	1.28	0.315	1.00153	0.722
590.0	0.1931	146.0	2.17	45.0	0.00170	0.0161	1.30	0.325	1.00150	0.722
600.0	0.1958	149.0	2.17	45.0	0.00168	0.0163	1.31	0.335	1.00147	0.722
700.0	0.1677	174.0	2.16	45.0	0.00143	0.0184	1.47	0.440	1.00126	0.719
800.0	0.1467	200.0	2.14	45.1	0.00125	0.0204	1.62	0.555	1.00110	0.716
900.0	0.1304	227.0	2.12	45.1	0.00111	0.0224	1.76	0.680	1.00098	0.715
1000.0	0.1173	255.0	2.09	45.1	0.00100	0.0243	1.89	0.814	1.00088	0.714
1500.0	0.07822	405.0	1.93	45.1	0.000666					
2000.0	0.05868	567.0	1.80	45.0	0.000500					
2500.0	0.04695	734.0	1.72	45.0	0.000400					
3000.0	0.03913	901.0	1.67	45.0	0.000333					
3500.0	0.03354	1070.0	1.64	45.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

50 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01851	1920.0	250.0	-64.10	-63.93	0.5853	0.2331	0.4701	4235.0
120.0	0.01874	1650.0	225.0	-61.72	-61.55	0.6055	0.2419	0.4809	3895.0
125.0	0.01893	1430.0	204.0	-59.30	-59.13	0.6253	0.2443	0.4864	3631.0
130.0	0.01925	1250.0	186.0	-56.87	-56.69	0.6444	0.2432	0.4893	3413.0
135.0	0.01954	1100.0	170.0	-54.42	-54.24	0.6629	0.2407	0.4910	3226.0
140.0	0.01984	975.0	156.0	-51.96	-51.78	0.6808	0.2376	0.4926	3060.0
145.0	0.02017	865.0	144.0	-49.50	-49.31	0.6981	0.2345	0.4947	2907.0
150.0	0.02052	768.0	132.0	-47.02	-46.83	0.7150	0.2318	0.4978	2765.0
155.0	0.02090	681.0	122.0	-44.52	-44.33	0.7314	0.2294	0.5022	2629.0
160.0	0.02130	602.0	112.0	-42.00	-41.81	0.7474	0.2274	0.5083	2497.0
* 161.000	0.02139	586.0	110.0	-41.47	-41.27	0.7507	0.2270	0.5098	2470.0
* 161.000	1.109	49.2	0.379	26.23	36.50	1.234	0.1917	0.2986	596.0
165.0	1.146	51.4	0.364	27.06	37.67	1.241	0.1901	0.2934	606.3
170.0	1.192	54.1	0.347	28.08	39.12	1.250	0.1885	0.2880	618.9
175.0	1.237	56.7	0.332	29.09	40.55	1.258	0.1871	0.2835	630.9
180.0	1.281	59.2	0.319	30.09	41.96	1.266	0.1860	0.2797	642.5
185.0	1.325	61.7	0.306	31.07	43.35	1.274	0.1850	0.2765	653.8
190.0	1.369	64.1	0.295	32.05	44.72	1.281	0.1841	0.2738	664.7
200.0	1.454	68.8	0.276	33.97	47.44	1.295	0.1828	0.2694	685.7
205.0	1.496	71.2	0.267	34.92	48.78	1.302	0.1822	0.2676	695.8
210.0	1.538	73.4	0.259	35.87	50.11	1.308	0.1817	0.2661	705.7
215.0	1.580	75.7	0.252	36.81	51.44	1.314	0.1813	0.2647	715.4
220.0	1.621	77.9	0.245	37.75	52.76	1.320	0.1810	0.2635	724.9
225.0	1.663	80.1	0.238	38.68	54.07	1.326	0.1806	0.2624	734.2
230.0	1.704	82.3	0.232	39.61	55.38	1.332	0.1804	0.2614	743.4
235.0	1.745	84.5	0.226	40.53	56.69	1.338	0.1801	0.2605	752.4
240.0	1.785	86.6	0.221	41.46	57.99	1.343	0.1799	0.2597	761.3
245.0	1.826	88.8	0.216	42.38	59.29	1.348	0.1797	0.2590	770.0
250.0	1.866	90.9	0.211	43.30	60.58	1.354	0.1795	0.2583	778.6
255.0	1.907	93.0	0.206	44.21	61.87	1.359	0.1793	0.2578	787.0
260.0	1.947	95.1	0.202	45.13	63.16	1.364	0.1792	0.2572	795.4
265.0	1.987	97.2	0.197	46.04	64.44	1.369	0.1791	0.2567	803.6
270.0	2.027	99.3	0.193	46.95	65.72	1.373	0.1789	0.2563	811.8
275.0	2.067	101.0	0.189	47.86	67.00	1.378	0.1788	0.2558	819.8
280.0	2.107	103.0	0.186	48.77	68.28	1.383	0.1787	0.2554	827.7
285.0	2.147	106.0	0.182	49.68	69.56	1.387	0.1786	0.2551	835.6
290.0	2.187	108.0	0.179	50.59	70.83	1.392	0.1785	0.2548	843.3
295.0	2.226	110.0	0.175	51.49	72.11	1.396	0.1785	0.2544	851.0
300.0	2.266	112.0	0.172	52.40	73.38	1.400	0.1784	0.2542	858.6
310.0	2.345	116.0	0.166	54.21	75.92	1.409	0.1783	0.2536	873.5
320.0	2.424	120.0	0.161	56.01	78.45	1.417	0.1782	0.2532	888.1
330.0	2.502	124.0	0.155	57.81	80.98	1.424	0.1781	0.2528	902.5
340.0	2.581	128.0	0.151	59.61	83.51	1.432	0.1780	0.2524	916.6
350.0	2.659	132.0	0.146	61.41	86.03	1.439	0.1779	0.2521	930.5
360.0	2.738	136.0	0.142	63.20	88.55	1.446	0.1779	0.2519	944.1
370.0	2.816	140.0	0.138	64.99	91.07	1.453	0.1778	0.2516	957.5
380.0	2.894	144.0	0.134	66.79	93.58	1.460	0.1778	0.2514	970.7
390.0	2.972	148.0	0.130	68.58	96.09	1.467	0.1778	0.2512	983.7
400.0	3.050	152.0	0.127	70.37	98.61	1.473	0.1777	0.2510	997.0
410.0	3.128	156.0	0.124	72.16	101.1	1.479	0.1777	0.2508	1009.0
420.0	3.205	160.0	0.121	73.94	103.6	1.485	0.1777	0.2507	1022.0
430.0	3.283	164.0	0.118	75.73	106.1	1.491	0.1776	0.2505	1034.0
440.0	3.361	168.0	0.115	77.52	108.6	1.497	0.1776	0.2504	1046.0
450.0	3.438	171.0	0.112	79.30	111.1	1.502	0.1776	0.2503	1058.0
460.0	3.516	175.0	0.110	81.09	113.6	1.508	0.1776	0.2502	1070.0
470.0	3.593	179.0	0.108	82.87	116.1	1.513	0.1776	0.2501	1082.0
480.0	3.671	183.0	0.105	84.65	118.6	1.519	0.1776	0.2500	1093.0
490.0	3.748	187.0	0.103	86.44	121.1	1.524	0.1776	0.2499	1105.0
500.0	3.826	191.0	0.101	88.22	123.6	1.529	0.1776	0.2499	1116.0
510.0	3.903	195.0	0.0989	90.00	126.1	1.534	0.1776	0.2498	1127.0
520.0	3.980	199.0	0.0970	91.78	128.6	1.539	0.1776	0.2498	1138.0
530.0	4.057	203.0	0.0951	93.57	131.1	1.543	0.1776	0.2497	1149.0
540.0	4.135	207.0	0.0933	95.35	133.6	1.548	0.1776	0.2497	1160.0
550.0	4.212	211.0	0.0916	97.13	136.1	1.553	0.1776	0.2496	1171.0
560.0	4.289	214.0	0.0899	98.91	138.6	1.557	0.1776	0.2496	1181.0
570.0	4.366	218.0	0.0883	100.7	141.1	1.561	0.1776	0.2496	1192.0
580.0	4.443	222.0	0.0868	102.5	143.6	1.566	0.1777	0.2496	1202.0
590.0	4.521	226.0	0.0853	104.3	146.1	1.570	0.1777	0.2495	1213.0
600.0	4.598	230.0	0.0839	106.0	148.6	1.574	0.1777	0.2495	1223.0
700.0	5.368	269.0	0.0717	123.9	173.6	1.613	0.1783	0.2499	1321.0
800.0	6.137	307.0	0.0627	141.8	198.6	1.646	0.1795	0.2509	1410.0
900.0	6.905	346.0	0.0557	159.8	223.8	1.676	0.1812	0.2525	1494.0
1000.0	7.673	384.0	0.0501	178.1	249.1	1.703	0.1835	0.2547	1572.0
1500.0	11.51	576.0	0.0334	273.6	380.1	1.809	0.1987	0.2697	1904.0
2000.0	15.34	768.0	0.0250	376.6	518.6	1.888	0.2125	0.2835	2178.0
2500.0	19.17	959.0	0.0200	485.5	663.0	1.953	0.2225	0.2934	2421.0
3000.0	23.00	1150.0	0.0167	598.5	811.5	2.007	0.2293	0.3002	2642.0
3500.0	26.83	1340.0	0.0143	714.4	962.9	2.053	0.2340	0.3050	2847.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

50 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(DH/DV)_P$	$V(DP/DV)_V$	$-V(DP/DV)_T$	$(DV/DT)_P/V$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	1/DEG. R	BTU/FT-HR-R	LB/FT-SEC X 10^5	SQ FT/HR		
115.0	54.03	195.0	19.8	104000.0	0.00241	0.0941	19.8	0.00370	1.46551	3.57
120.0	53.36	188.0	17.4	87900.0	0.00255	0.0910	16.8	0.00355	1.45912	3.21
125.0	52.66	180.0	15.8	75200.0	0.00271	0.0878	14.6	0.00343	1.45244	2.92
130.0	51.93	171.0	14.7	64900.0	0.00286	0.0847	13.1	0.00333	1.44548	2.72
135.0	51.18	163.0	13.3	56400.0	0.00302	0.0815	11.9	0.00324	1.43827	2.59
140.0	50.39	155.0	13.0	43100.0	0.00318	0.0784	10.9	0.00316	1.43079	2.47
145.0	49.58	148.0	12.3	42900.0	0.00335	0.0753	9.88	0.00307	1.42307	2.34
150.0	48.73	141.0	11.7	37400.0	0.00353	0.0722	9.12	0.00298	1.41508	2.26
155.0	47.85	134.0	11.1	32600.0	0.00374	0.0691	8.41	0.00288	1.40682	2.20
160.0	46.94	128.0	10.5	28300.0	0.00397	0.0661	7.74	0.00277	1.39825	2.14
* 161.000	46.75	127.0	10.4	27400.0	0.00402	0.0655	7.60	0.00275	1.39641	2.13
* 161.000	0.3018	35.0	2.19	44.4	0.00853	0.00532	0.428	0.0197	1.00681	0.866
165.0	0.8727	36.2	2.19	44.9	0.00811	0.00542	0.437	0.0212	1.00659	0.852
170.0	0.3390	37.7	2.19	45.4	0.00764	0.00556	0.449	0.0230	1.00633	0.837
175.0	0.8084	39.1	2.19	45.8	0.00724	0.00570	0.460	0.0243	1.00610	0.824
180.0	0.7804	40.6	2.20	46.2	0.00689	0.00584	0.472	0.0268	1.00589	0.814
185.0	0.7545	42.0	2.20	46.6	0.00653	0.00598	0.484	0.0287	1.00569	0.805
190.0	0.7306	43.4	2.20	46.9	0.00630	0.00612	0.495	0.0306	1.00551	0.798
200.0	0.6877	46.2	2.20	47.3	0.00583	0.00640	0.519	0.0346	1.00519	0.786
205.0	0.6663	47.6	2.20	47.6	0.00562	0.00654	0.531	0.0366	1.00504	0.781
210.0	0.6500	49.0	2.20	47.7	0.00543	0.00669	0.542	0.0387	1.00490	0.777
215.0	0.6329	50.3	2.20	47.9	0.00526	0.00683	0.554	0.0408	1.00477	0.773
220.0	0.6167	51.7	2.19	48.0	0.00510	0.00697	0.566	0.0429	1.00465	0.770
225.0	0.6014	53.0	2.19	48.2	0.00495	0.00711	0.577	0.0451	1.00454	0.767
230.0	0.5869	54.4	2.19	48.3	0.00481	0.00725	0.589	0.0473	1.00443	0.764
235.0	0.5732	55.7	2.19	48.4	0.00468	0.00739	0.601	0.0495	1.00432	0.762
240.0	0.5601	57.0	2.19	48.5	0.00455	0.00753	0.612	0.0518	1.00422	0.760
245.0	0.5477	58.4	2.19	48.6	0.00444	0.00767	0.624	0.0541	1.00413	0.758
250.0	0.5358	59.7	2.19	48.7	0.00433	0.00781	0.635	0.0564	1.00404	0.756
255.0	0.5245	61.0	2.19	48.8	0.00423	0.00795	0.646	0.0588	1.00395	0.754
260.0	0.5136	62.3	2.19	48.9	0.00413	0.00809	0.658	0.0612	1.00387	0.753
265.0	0.5032	63.6	2.19	48.9	0.00403	0.00823	0.669	0.0637	1.00379	0.751
270.0	0.4933	64.9	2.19	49.0	0.00395	0.00837	0.680	0.0662	1.00372	0.750
275.0	0.4838	66.2	2.19	49.0	0.00386	0.00850	0.691	0.0687	1.00365	0.749
280.0	0.4746	67.5	2.19	49.1	0.00378	0.00864	0.703	0.0713	1.00358	0.748
285.0	0.4658	68.8	2.19	49.2	0.00371	0.00878	0.714	0.0739	1.00351	0.747
290.0	0.4573	70.1	2.19	49.2	0.00363	0.00891	0.725	0.0765	1.00345	0.746
295.0	0.4492	71.4	2.19	49.2	0.00356	0.00905	0.736	0.0792	1.00339	0.745
300.0	0.4413	72.7	2.19	49.3	0.00349	0.00918	0.747	0.0819	1.00333	0.744
310.0	0.4265	75.3	2.19	49.4	0.00337	0.00945	0.768	0.0874	1.00321	0.742
320.0	0.4126	77.9	2.19	49.4	0.00325	0.00972	0.790	0.0931	1.00311	0.741
330.0	0.3996	80.5	2.18	49.5	0.00314	0.0100	0.811	0.0988	1.00301	0.739
340.0	0.3874	83.0	2.18	49.5	0.00304	0.0102	0.832	0.105	1.00292	0.738
350.0	0.3760	85.6	2.18	49.6	0.00295	0.0105	0.853	0.111	1.00283	0.737
360.0	0.3653	88.1	2.18	49.6	0.00286	0.0108	0.874	0.117	1.00275	0.736
370.0	0.3551	90.7	2.18	49.7	0.00277	0.0110	0.894	0.123	1.00268	0.735
380.0	0.3455	93.2	2.18	49.7	0.00270	0.0113	0.914	0.130	1.00260	0.734
390.0	0.3365	95.8	2.18	49.7	0.00262	0.0115	0.934	0.136	1.00254	0.733
400.0	0.3279	98.3	2.18	49.8	0.00255	0.0118	0.954	0.143	1.00247	0.732
410.0	0.3197	101.0	2.18	49.8	0.00249	0.0120	0.974	0.150	1.00241	0.731
420.0	0.3120	103.0	2.18	49.8	0.00242	0.0123	0.993	0.157	1.00235	0.731
430.0	0.3046	106.0	2.18	49.8	0.00237	0.0125	1.01	0.164	1.00230	0.730
440.0	0.2976	108.0	2.18	49.8	0.00231	0.0128	1.03	0.171	1.00224	0.729
450.0	0.2910	111.0	2.18	49.9	0.00226	0.0130	1.05	0.178	1.00219	0.729
460.0	0.2844	113.0	2.18	49.9	0.00220	0.0132	1.07	0.186	1.00214	0.728
470.0	0.2783	116.0	2.18	49.9	0.00216	0.0135	1.09	0.193	1.00210	0.728
480.0	0.2724	119.0	2.18	49.9	0.00211	0.0137	1.11	0.201	1.00205	0.727
490.0	0.2668	121.0	2.18	49.9	0.00206	0.0139	1.12	0.209	1.00201	0.727
500.0	0.2614	124.0	2.18	49.9	0.00202	0.0142	1.14	0.217	1.00197	0.726
510.0	0.2562	126.0	2.17	49.9	0.00198	0.0144	1.16	0.225	1.00193	0.726
520.0	0.2512	129.0	2.17	50.0	0.00194	0.0146	1.18	0.233	1.00189	0.725
530.0	0.2465	131.0	2.17	50.0	0.00190	0.0148	1.20	0.241	1.00186	0.725
540.0	0.2419	134.0	2.17	50.0	0.00187	0.0151	1.21	0.249	1.00182	0.724
550.0	0.2374	136.0	2.17	50.0	0.00183	0.0153	1.23	0.258	1.00179	0.724
560.0	0.2331	139.0	2.17	50.0	0.00180	0.0155	1.25	0.266	1.00176	0.723
570.0	0.2290	141.0	2.17	50.0	0.00177	0.0157	1.26	0.275	1.00173	0.723
580.0	0.2251	144.0	2.17	50.0	0.00174	0.0159	1.28	0.284	1.00170	0.723
590.0	0.2212	146.0	2.17	50.0	0.00171	0.0161	1.30	0.292	1.00167	0.722
600.0	0.2175	149.0	2.17	50.0	0.00163	0.0164	1.31	0.301	1.00164	0.722
700.0	0.1863	174.0	2.16	50.0	0.00143	0.0184	1.47	0.396	1.00140	0.719
800.0	0.1630	200.0	2.14	50.1	0.00125	0.0204	1.62	0.500	1.00123	0.716
900.0	0.1448	227.0	2.12	50.1	0.00111	0.0224	1.76	0.612	1.00109	0.715
1000.0	0.1303	255.0	2.09	50.1	0.00100	0.0243	1.89	0.732	1.00098	0.714
1500.0	0.08690	405.0	1.93	50.1	0.000666					
2000.0	0.06513	568.0	1.80	50.1	0.000500					
2500.0	0.05216	734.0	1.72	50.0	0.000400					
3000.0	0.04347	901.0	1.67	50.0	0.000333					
3500.0	0.03727	1070.0	1.64	50.0	0.000286					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

100 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01850	1930.0	249.0	-64.15	-63.81	0.5849	0.2345	0.4695	4230.0
120.0	0.01873	1660.0	224.0	-61.78	-61.43	0.6051	0.2432	0.4801	3893.0
125.0	0.01898	1440.0	204.0	-59.36	-59.01	0.6248	0.2455	0.4856	3630.0
130.0	0.01924	1260.0	186.0	-56.93	-56.58	0.6439	0.2444	0.4884	3414.0
135.0	0.01952	1110.0	170.0	-54.49	-54.13	0.6624	0.2417	0.4900	3229.0
140.0	0.01982	984.0	156.0	-52.04	-51.68	0.6802	0.2386	0.4915	3064.0
145.0	0.02015	874.0	144.0	-49.59	-49.21	0.6975	0.2354	0.4934	2913.0
150.0	0.02049	777.0	133.0	-47.12	-46.74	0.7143	0.2326	0.4963	2772.0
155.0	0.02085	691.0	122.0	-44.64	-44.25	0.7306	0.2301	0.5005	2638.0
160.0	0.02127	612.0	113.0	-42.13	-41.73	0.7466	0.2281	0.5063	2508.0
165.0	0.02170	539.0	104.0	-39.59	-39.18	0.7623	0.2264	0.5140	2381.0
170.0	0.02217	472.0	95.5	-37.00	-36.59	0.7778	0.2251	0.5240	2257.0
175.0	0.02270	410.0	87.6	-34.36	-33.94	0.7932	0.2241	0.5369	2132.0
* 176.900	0.02291	387.0	84.7	-33.35	-32.92	0.7989	0.2238	0.5427	2085.0
* 176.900	0.5667	45.8	0.784	27.26	37.76	1.199	0.1994	0.3405	601.9
180.0	0.5836	48.0	0.754	28.00	38.80	1.205	0.1975	0.3320	611.3
185.0	0.6098	51.3	0.712	29.14	40.43	1.214	0.1949	0.3209	625.7
190.0	0.6353	54.5	0.677	30.25	42.02	1.222	0.1927	0.3120	639.2
200.0	0.6842	60.4	0.617	32.40	45.07	1.238	0.1894	0.2988	664.5
205.0	0.7079	63.2	0.593	33.44	46.55	1.245	0.1881	0.2937	676.4
210.0	0.7312	66.0	0.570	34.46	48.00	1.252	0.1869	0.2894	687.8
215.0	0.7541	68.6	0.550	35.48	49.44	1.259	0.1860	0.2857	698.9
220.0	0.7767	71.2	0.531	36.48	50.86	1.265	0.1851	0.2825	709.7
225.0	0.7991	73.8	0.514	37.47	52.27	1.272	0.1844	0.2797	720.1
230.0	0.8213	76.3	0.498	38.45	53.66	1.278	0.1838	0.2773	730.3
235.0	0.8432	78.8	0.484	39.43	55.04	1.284	0.1832	0.2751	740.3
240.0	0.8649	81.2	0.470	40.40	56.41	1.289	0.1827	0.2732	750.0
245.0	0.8865	83.6	0.457	41.36	57.77	1.295	0.1822	0.2715	759.5
250.0	0.9080	85.9	0.445	42.31	59.13	1.300	0.1819	0.2700	768.8
255.0	0.9293	88.3	0.434	43.27	60.47	1.306	0.1815	0.2686	778.0
260.0	0.9504	90.6	0.424	44.21	61.81	1.311	0.1812	0.2673	787.0
265.0	0.9715	92.9	0.414	45.16	63.15	1.316	0.1809	0.2662	795.8
270.0	0.9925	95.2	0.404	46.10	64.48	1.321	0.1806	0.2652	804.5
275.0	1.013	97.4	0.395	47.03	65.80	1.326	0.1804	0.2642	813.0
280.0	1.034	100.0	0.387	47.97	67.12	1.331	0.1802	0.2633	821.4
285.0	1.055	102.0	0.378	48.90	68.43	1.335	0.1800	0.2625	829.7
290.0	1.075	104.0	0.371	49.83	69.74	1.340	0.1798	0.2618	837.9
295.0	1.096	106.0	0.363	50.76	71.05	1.344	0.1797	0.2611	845.9
300.0	1.116	108.0	0.356	51.68	72.36	1.349	0.1795	0.2605	853.9
310.0	1.157	113.0	0.343	53.52	74.95	1.357	0.1793	0.2594	869.5
320.0	1.198	117.0	0.331	55.36	77.54	1.365	0.1791	0.2584	884.7
330.0	1.238	121.0	0.319	57.19	80.12	1.373	0.1789	0.2576	899.6
340.0	1.279	126.0	0.309	59.02	82.70	1.381	0.1787	0.2568	914.2
350.0	1.319	130.0	0.299	60.84	85.26	1.389	0.1786	0.2562	928.5
360.0	1.359	134.0	0.290	62.66	87.82	1.396	0.1785	0.2556	942.5
370.0	1.399	138.0	0.281	64.47	90.37	1.403	0.1784	0.2551	956.3
380.0	1.438	142.0	0.273	66.29	92.92	1.410	0.1783	0.2546	969.8
390.0	1.478	146.0	0.265	68.09	95.47	1.416	0.1782	0.2542	983.1
400.0	1.518	150.0	0.258	69.90	98.01	1.423	0.1782	0.2538	996.0
410.0	1.557	154.0	0.251	71.71	100.5	1.429	0.1781	0.2535	1009.0
420.0	1.597	158.0	0.245	73.51	103.1	1.435	0.1780	0.2532	1022.0
430.0	1.636	163.0	0.239	75.31	105.6	1.441	0.1780	0.2529	1034.0
440.0	1.675	167.0	0.233	77.11	108.1	1.447	0.1780	0.2526	1047.0
450.0	1.715	171.0	0.228	78.91	110.7	1.452	0.1779	0.2524	1059.0
460.0	1.754	175.0	0.222	80.70	113.2	1.458	0.1779	0.2522	1071.0
470.0	1.793	179.0	0.218	82.50	115.7	1.463	0.1779	0.2520	1083.0
480.0	1.832	183.0	0.213	84.29	118.2	1.469	0.1778	0.2518	1094.0
490.0	1.871	187.0	0.208	86.09	120.7	1.474	0.1778	0.2516	1106.0
500.0	1.910	191.0	0.204	87.88	123.3	1.479	0.1778	0.2515	1117.0
510.0	1.949	195.0	0.200	89.67	125.8	1.484	0.1778	0.2513	1129.0
520.0	1.988	198.0	0.196	91.46	128.3	1.489	0.1778	0.2512	1140.0
530.0	2.027	202.0	0.192	93.25	130.8	1.494	0.1778	0.2511	1151.0
540.0	2.066	206.0	0.188	95.04	133.3	1.498	0.1778	0.2510	1162.0
550.0	2.105	210.0	0.185	96.83	135.8	1.503	0.1778	0.2509	1173.0
560.0	2.144	214.0	0.181	98.62	138.3	1.507	0.1778	0.2508	1184.0
570.0	2.183	218.0	0.178	100.4	140.8	1.512	0.1778	0.2508	1194.0
580.0	2.222	222.0	0.175	102.2	143.3	1.516	0.1778	0.2507	1205.0
590.0	2.261	226.0	0.172	104.0	145.8	1.520	0.1779	0.2506	1215.0
600.0	2.299	230.0	0.169	105.8	148.3	1.525	0.1779	0.2506	1225.0
700.0	2.686	269.0	0.144	123.7	173.4	1.563	0.1784	0.2506	1323.0
800.0	3.072	308.0	0.126	141.6	198.5	1.597	0.1796	0.2514	1413.0
900.0	3.457	347.0	0.112	159.7	223.7	1.626	0.1813	0.2529	1497.0
1000.0	3.842	385.0	0.100	178.0	249.1	1.653	0.1836	0.2550	1575.0
1500.0	5.761	578.0	0.0667	273.5	380.2	1.759	0.1988	0.2699	1906.0
2000.0	7.679	769.0	0.0500	376.5	518.7	1.839	0.2126	0.2836	2181.0
2500.0	9.594	961.0	0.0400	485.4	663.1	1.903	0.2225	0.2934	2424.0
3000.0	11.51	1150.0	0.0333	598.5	811.6	1.957	0.2293	0.3002	2645.0
3500.0	13.43	1340.0	0.0286	714.4	963.0	2.004	0.2341	0.3050	2849.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

100 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial V)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.05	196.0	19.7	104000.0	0.00233	0.0942	20.0	0.00371	1.46576	3.59
120.0	53.39	189.0	17.3	88400.0	0.00254	0.0911	17.0	0.00355	1.45941	3.22
125.0	52.70	181.0	15.7	75800.0	0.00269	0.0880	14.7	0.00344	1.45277	2.93
130.0	51.97	172.0	14.6	65400.0	0.00284	0.0848	13.2	0.00334	1.44586	2.73
135.0	51.22	164.0	13.7	56900.0	0.00299	0.0817	12.0	0.00325	1.43870	2.59
140.0	50.44	156.0	13.0	49600.0	0.00315	0.0786	11.0	0.00317	1.43128	2.47
145.0	49.63	149.0	12.3	43400.0	0.00332	0.0755	9.94	0.00308	1.42361	2.34
150.0	48.80	142.0	11.7	37900.0	0.00350	0.0724	9.18	0.00299	1.41569	2.26
155.0	47.93	136.0	11.1	33100.0	0.00369	0.0694	8.46	0.00289	1.40750	2.20
160.0	47.03	129.0	10.5	28800.0	0.00392	0.0664	7.79	0.00279	1.39902	2.14
165.0	46.08	123.0	9.95	24900.0	0.00418	0.0634	7.17	0.00268	1.39020	2.09
170.0	45.10	117.0	9.41	21300.0	0.00448	0.0604	6.58	0.00256	1.38100	2.05
175.0	44.06	111.0	8.87	18000.0	0.00486	0.0575	6.02	0.00243	1.37134	2.03
* 176.900	43.65	108.0	8.67	16900.0	0.00502	0.0564	5.82	0.00238	1.36756	2.02
* 176.900	1.765	35.1	2.23	80.8	0.00970	0.00618	0.486	0.0103	1.01335	0.964
180.0	1.714	36.2	2.23	82.2	0.00917	0.00625	0.492	0.0110	1.01296	0.941
185.0	1.640	37.9	2.23	84.1	0.00847	0.00637	0.503	0.0121	1.01240	0.912
190.0	1.574	39.5	2.23	85.7	0.00783	0.00649	0.514	0.0132	1.01190	0.889
200.0	1.462	42.7	2.23	88.3	0.00699	0.00675	0.536	0.0154	1.01105	0.855
205.0	1.413	44.3	2.23	89.3	0.00663	0.00687	0.547	0.0166	1.01068	0.842
210.0	1.368	45.8	2.23	90.2	0.00632	0.00700	0.558	0.0177	1.01034	0.831
215.0	1.326	47.3	2.23	91.0	0.00604	0.00714	0.570	0.0188	1.01002	0.821
220.0	1.287	48.8	2.23	91.7	0.00579	0.00727	0.581	0.0200	1.00973	0.813
225.0	1.251	50.2	2.23	92.3	0.00557	0.00740	0.592	0.0211	1.00945	0.806
230.0	1.218	51.7	2.23	92.9	0.00537	0.00753	0.603	0.0223	1.00920	0.800
235.0	1.186	53.1	2.23	93.4	0.00518	0.00766	0.614	0.0235	1.00896	0.794
240.0	1.156	54.5	2.23	93.9	0.00501	0.00779	0.626	0.0247	1.00873	0.789
245.0	1.128	56.0	2.22	94.3	0.00485	0.00793	0.637	0.0259	1.00852	0.785
250.0	1.101	57.4	2.22	94.7	0.00471	0.00806	0.648	0.0271	1.00832	0.781
255.0	1.076	58.8	2.22	95.0	0.00457	0.00819	0.659	0.0283	1.00813	0.778
260.0	1.052	60.2	2.22	95.3	0.00444	0.00832	0.670	0.0296	1.00795	0.775
265.0	1.029	61.5	2.22	95.6	0.00433	0.00846	0.681	0.0309	1.00777	0.772
270.0	1.008	62.9	2.22	95.9	0.00421	0.00859	0.692	0.0321	1.00761	0.769
275.0	0.9868	64.3	2.22	96.1	0.00411	0.00872	0.703	0.0334	1.00745	0.767
280.0	0.9670	65.7	2.22	96.4	0.00401	0.00885	0.714	0.0348	1.00730	0.765
285.0	0.9480	67.0	2.22	96.6	0.00392	0.00898	0.725	0.0361	1.00716	0.763
290.0	0.9299	68.4	2.22	96.8	0.00383	0.00912	0.736	0.0374	1.00702	0.761
295.0	0.9124	69.7	2.22	97.0	0.00375	0.00925	0.746	0.0388	1.00689	0.759
300.0	0.8957	71.1	2.21	97.1	0.00367	0.00938	0.757	0.0402	1.00676	0.757
310.0	0.8641	73.7	2.21	97.4	0.00352	0.00964	0.778	0.0430	1.00652	0.754
320.0	0.8348	76.4	2.21	97.7	0.00338	0.00990	0.800	0.0459	1.00630	0.751
330.0	0.8075	79.1	2.21	98.0	0.00326	0.0102	0.821	0.0488	1.00609	0.749
340.0	0.7821	81.7	2.21	98.2	0.00314	0.0104	0.841	0.0518	1.00590	0.747
350.0	0.7583	84.3	2.21	98.4	0.00304	0.0107	0.862	0.0549	1.00572	0.745
360.0	0.7360	87.0	2.20	98.5	0.00294	0.0109	0.882	0.0581	1.00555	0.743
370.0	0.7150	89.6	2.20	98.7	0.00285	0.0112	0.902	0.0613	1.00539	0.742
380.0	0.6952	92.2	2.20	98.8	0.00276	0.0114	0.922	0.0645	1.00524	0.740
390.0	0.6765	94.8	2.20	99.0	0.00268	0.0117	0.942	0.0679	1.00510	0.739
400.0	0.6589	97.4	2.20	99.1	0.00261	0.0119	0.962	0.0712	1.00497	0.738
410.0	0.6422	100.0	2.20	99.2	0.00254	0.0122	0.981	0.0747	1.00484	0.737
420.0	0.6263	103.0	2.20	99.3	0.00247	0.0124	1.00	0.0782	1.00472	0.735
430.0	0.6112	105.0	2.20	99.3	0.00241	0.0126	1.02	0.0818	1.00461	0.734
440.0	0.5969	108.0	2.20	99.4	0.00235	0.0129	1.04	0.0854	1.00450	0.734
450.0	0.5832	110.0	2.19	99.5	0.00229	0.0131	1.06	0.0891	1.00440	0.733
460.0	0.5702	113.0	2.19	100.0	0.00224	0.0133	1.08	0.0928	1.00430	0.732
470.0	0.5577	115.0	2.19	100.0	0.00218	0.0136	1.09	0.0966	1.00421	0.731
480.0	0.5458	118.0	2.19	100.0	0.00213	0.0138	1.11	0.100	1.00412	0.730
490.0	0.5344	121.0	2.19	100.0	0.00209	0.0140	1.13	0.104	1.00403	0.730
500.0	0.5235	123.0	2.19	100.0	0.00204	0.0143	1.15	0.108	1.00395	0.729
510.0	0.5130	126.0	2.19	100.0	0.00200	0.0145	1.17	0.112	1.00387	0.728
520.0	0.5029	128.0	2.19	100.0	0.00196	0.0147	1.18	0.116	1.00379	0.728
530.0	0.4933	131.0	2.19	100.0	0.00192	0.0149	1.20	0.121	1.00372	0.727
540.0	0.4840	133.0	2.19	100.0	0.00188	0.0152	1.22	0.125	1.00365	0.727
550.0	0.4750	136.0	2.19	100.0	0.00185	0.0154	1.24	0.129	1.00358	0.726
560.0	0.4664	138.0	2.18	100.0	0.00181	0.0156	1.25	0.133	1.00352	0.726
570.0	0.4581	141.0	2.18	100.0	0.00178	0.0158	1.27	0.138	1.00345	0.725
580.0	0.4501	143.0	2.18	100.0	0.00175	0.0160	1.29	0.142	1.00339	0.725
590.0	0.4424	146.0	2.18	100.0	0.00172	0.0162	1.30	0.146	1.00333	0.724
600.0	0.4349	149.0	2.18	100.0	0.00169	0.0164	1.32	0.151	1.00328	0.724
700.0	0.3723	174.0	2.17	100.0	0.00144	0.0185	1.48	0.198	1.00281	0.720
800.0	0.3255	200.0	2.15	100.0	0.00125	0.0205	1.63	0.251	1.00245	0.717
900.0	0.2892	227.0	2.13	100.0	0.00111	0.0224	1.76	0.307	1.00218	0.715
1000.0	0.2603	255.0	2.10	100.0	0.00100	0.0244	1.90	0.367	1.00196	0.714
1500.0	0.1736	405.0	1.93	100.0	0.000666					
2000.0	0.1302	568.0	1.81	100.0	0.000499					
2500.0	0.1042	735.0	1.73	100.0	0.000399					
3000.0	0.08688	902.0	1.67	100.0	0.000333					
3500.0	0.07449	1070.0	1.64	100.0	0.000285					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

150 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01343	1940.0	249.0	-64.19	-63.68	0.5845	0.2359	0.4688	4225.0
120.0	0.01872	1670.0	224.0	-61.83	-61.31	0.6047	0.2445	0.4794	3830.0
125.0	0.01896	1450.0	203.0	-59.42	-58.90	0.6244	0.2467	0.4848	3630.0
130.0	0.01923	1270.0	186.0	-57.00	-56.46	0.6434	0.2455	0.4875	3416.0
135.0	0.01951	1120.0	170.0	-54.56	-54.02	0.6613	0.2428	0.4891	3232.0
140.0	0.01980	993.0	156.0	-52.12	-51.57	0.6797	0.2395	0.4904	3069.0
145.0	0.02012	883.0	144.0	-49.68	-43.12	0.6969	0.2363	0.4922	2919.0
150.0	0.02047	786.0	133.0	-47.22	-46.65	0.7136	0.2334	0.4949	2780.0
155.0	0.02083	700.0	123.0	-44.74	-44.17	0.7299	0.2309	0.4989	2647.0
160.0	0.02123	621.0	113.0	-42.25	-41.66	0.7458	0.2288	0.5043	2519.0
165.0	0.02165	549.0	104.0	-39.72	-39.12	0.7615	0.2271	0.5116	2394.0
170.0	0.02212	482.0	96.1	-37.15	-36.54	0.7769	0.2257	0.5210	2271.0
175.0	0.02264	420.0	88.3	-34.53	-33.91	0.7921	0.2246	0.5331	2148.0
180.0	0.02320	361.0	80.9	-31.85	-31.20	0.8074	0.2238	0.5487	2025.0
185.0	0.02385	306.0	73.7	-29.07	-28.41	0.8227	0.2233	0.5690	1900.0
* 187.700	0.02423	277.0	69.9	-27.55	-26.88	0.8309	0.2231	0.5825	1832.0
* 187.700	0.3750	41.2	1.24	27.44	37.85	1.176	0.2062	0.3896	600.6
190.0	0.3848	43.2	1.20	28.06	38.75	1.181	0.2042	0.3780	608.8
200.0	0.4238	51.0	1.06	30.57	42.34	1.199	0.1976	0.3431	640.5
205.0	0.4420	54.5	1.00	31.75	44.02	1.207	0.1952	0.3312	654.8
210.0	0.4597	57.9	0.952	32.89	45.66	1.215	0.1931	0.3217	668.3
215.0	0.4768	61.1	0.909	34.00	47.24	1.223	0.1914	0.3138	681.2
220.0	0.4935	64.2	0.871	35.09	48.80	1.230	0.1899	0.3073	693.5
225.0	0.5099	67.1	0.837	36.16	50.32	1.237	0.1887	0.3018	705.3
230.0	0.5259	70.0	0.806	37.21	51.82	1.243	0.1876	0.2970	716.7
235.0	0.5418	72.8	0.779	38.24	53.29	1.250	0.1866	0.2929	727.7
240.0	0.5573	75.6	0.753	39.26	54.75	1.256	0.1858	0.2894	738.5
245.0	0.5727	78.2	0.729	40.28	56.18	1.262	0.1851	0.2862	748.9
250.0	0.5879	80.9	0.708	41.28	57.61	1.267	0.1844	0.2835	759.0
255.0	0.6030	83.5	0.687	42.27	59.02	1.273	0.1838	0.2810	768.9
260.0	0.6179	86.0	0.669	43.26	60.42	1.279	0.1833	0.2788	778.5
265.0	0.6326	88.5	0.651	44.24	61.81	1.284	0.1829	0.2769	788.0
270.0	0.6473	91.0	0.634	45.21	63.19	1.289	0.1825	0.2751	797.2
275.0	0.6618	93.4	0.619	46.18	64.56	1.294	0.1821	0.2735	806.3
280.0	0.6763	95.8	0.604	47.14	65.92	1.299	0.1818	0.2720	815.2
285.0	0.6907	98.2	0.590	48.10	67.28	1.304	0.1815	0.2707	824.0
290.0	0.7050	101.0	0.577	49.05	68.63	1.308	0.1812	0.2695	832.6
295.0	0.7192	103.0	0.564	50.00	69.97	1.313	0.1809	0.2684	841.0
300.0	0.7333	105.0	0.552	50.94	71.31	1.317	0.1807	0.2673	849.3
310.0	0.7614	110.0	0.530	52.83	73.98	1.326	0.1803	0.2655	865.6
320.0	0.7893	114.0	0.510	54.70	76.63	1.335	0.1800	0.2640	881.5
330.0	0.8170	119.0	0.491	56.56	79.26	1.343	0.1797	0.2626	896.9
340.0	0.8445	123.0	0.474	58.42	81.88	1.351	0.1795	0.2614	912.0
350.0	0.8719	128.0	0.458	60.27	84.49	1.358	0.1793	0.2604	926.7
360.0	0.8992	132.0	0.444	62.11	87.09	1.365	0.1791	0.2595	941.1
370.0	0.9263	136.0	0.430	63.95	89.68	1.373	0.1789	0.2587	955.3
380.0	0.9533	141.0	0.417	65.78	92.26	1.379	0.1788	0.2579	969.1
390.0	0.9802	145.0	0.405	67.61	94.84	1.386	0.1787	0.2573	982.7
400.0	1.007	149.0	0.394	69.43	97.41	1.393	0.1786	0.2567	996.0
410.0	1.034	153.0	0.383	71.25	100.0	1.399	0.1785	0.2562	1009.0
420.0	1.060	157.0	0.373	73.07	102.5	1.405	0.1784	0.2557	1022.0
430.0	1.087	161.0	0.363	74.89	105.1	1.411	0.1783	0.2553	1035.0
440.0	1.114	166.0	0.354	76.70	107.6	1.417	0.1783	0.2549	1047.0
450.0	1.140	170.0	0.346	78.51	110.2	1.423	0.1782	0.2545	1060.0
460.0	1.167	174.0	0.338	80.32	112.7	1.428	0.1782	0.2542	1072.0
470.0	1.193	178.0	0.330	82.13	115.3	1.434	0.1781	0.2539	1084.0
480.0	1.219	182.0	0.322	83.93	117.8	1.439	0.1781	0.2536	1096.0
490.0	1.246	186.0	0.315	85.74	120.3	1.444	0.1781	0.2533	1107.0
500.0	1.272	190.0	0.309	87.54	122.9	1.449	0.1780	0.2531	1119.0
510.0	1.298	194.0	0.302	89.34	125.4	1.454	0.1780	0.2529	1130.0
520.0	1.324	198.0	0.296	91.14	127.9	1.459	0.1780	0.2527	1142.0
530.0	1.351	202.0	0.290	92.94	130.5	1.464	0.1780	0.2525	1153.0
540.0	1.377	206.0	0.284	94.74	133.0	1.469	0.1780	0.2523	1164.0
550.0	1.403	210.0	0.279	96.53	135.5	1.474	0.1780	0.2522	1175.0
560.0	1.429	214.0	0.274	98.33	138.0	1.478	0.1780	0.2521	1186.0
570.0	1.455	218.0	0.269	100.1	140.5	1.483	0.1780	0.2519	1196.0
580.0	1.481	222.0	0.264	101.9	143.1	1.487	0.1780	0.2518	1207.0
590.0	1.507	226.0	0.259	103.7	145.6	1.491	0.1780	0.2517	1217.0
600.0	1.533	230.0	0.255	105.5	148.1	1.495	0.1780	0.2516	1228.0
700.0	1.793	270.0	0.217	123.4	173.2	1.534	0.1786	0.2513	1326.0
800.0	2.051	309.0	0.189	141.4	198.4	1.568	0.1797	0.2519	1416.0
900.0	2.308	348.0	0.168	159.5	223.6	1.598	0.1814	0.2533	1500.0
1000.0	2.565	386.0	0.151	177.8	249.1	1.624	0.1837	0.2554	1578.0
1500.0	3.846	579.0	0.100	273.4	380.3	1.731	0.1948	0.2700	1903.0
2000.0	5.124	771.0	0.0751	376.5	514.8	1.810	0.2126	0.2836	2183.0
2500.0	6.402	963.0	0.0600	485.4	663.3	1.875	0.2225	0.2935	2426.0
3000.0	7.679	1150.0	0.0500	598.5	811.8	1.929	0.2293	0.3003	2647.0
3500.0	8.956	1350.0	0.0429	714.4	963.2	1.975	0.2341	0.3050	2851.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

150 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DV)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.08	197.0	19.5	105000.0	0.00233	0.0943	20.1	0.00372	1.46691	3.60
120.0	53.42	190.0	17.2	83000.0	0.00252	0.0913	17.1	0.00356	1.45969	3.23
125.0	52.73	182.0	15.6	76300.0	0.00267	0.0881	14.8	0.00345	1.45310	2.94
130.0	52.01	173.0	14.5	66000.0	0.00282	0.0850	13.2	0.00335	1.44624	2.73
135.0	51.27	165.0	13.7	57400.0	0.00297	0.0819	12.1	0.00327	1.43912	2.59
140.0	50.49	157.0	12.9	50100.0	0.00312	0.0788	11.0	0.00318	1.43176	2.48
145.0	49.69	150.0	12.3	43900.0	0.00323	0.0757	10.0	0.00310	1.42415	2.34
150.0	48.86	143.0	11.7	38400.0	0.00343	0.0727	9.23	0.00300	1.41630	2.26
155.0	48.00	137.0	11.1	33600.0	0.00365	0.0696	8.52	0.00291	1.40818	2.20
160.0	47.11	130.0	10.5	29300.0	0.00387	0.0667	7.85	0.00281	1.39978	2.14
165.0	46.18	124.0	10.0	25400.0	0.00412	0.0637	7.23	0.00270	1.39106	2.09
170.0	45.20	118.0	9.42	21800.0	0.00441	0.0608	6.64	0.00258	1.38198	2.05
175.0	44.18	112.0	8.90	18500.0	0.00476	0.0578	6.09	0.00246	1.37246	2.02
180.0	43.09	105.0	8.38	15600.0	0.00519	0.0549	5.56	0.00232	1.36241	2.00
185.0	41.93	99.1	7.87	12800.0	0.00574	0.0520	5.06	0.00218	1.35172	1.99
* 187.700	41.28	95.4	7.59	11500.0	0.00611	0.0504	4.80	0.00209	1.34569	2.00
* 187.700	2.666	34.4	2.26	110.0	0.0113	0.00694	0.531	0.00668	1.02023	1.07
190.0	2.599	35.4	2.26	112.0	0.0107	0.00698	0.535	0.00710	1.01971	1.04
200.0	2.360	39.1	2.26	120.0	0.00877	0.00717	0.555	0.00886	1.01788	0.956
205.0	2.262	40.9	2.26	123.0	0.00811	0.00727	0.565	0.00971	1.01714	0.926
210.0	2.176	42.6	2.26	126.0	0.00756	0.00738	0.575	0.0106	1.01648	0.902
215.0	2.097	44.2	2.26	128.0	0.00710	0.00750	0.586	0.0114	1.01588	0.883
220.0	2.026	45.9	2.26	130.0	0.00670	0.00761	0.596	0.0122	1.01534	0.867
225.0	1.961	47.5	2.26	132.0	0.00636	0.00773	0.607	0.0131	1.01485	0.853
230.0	1.901	49.0	2.26	133.0	0.00606	0.00785	0.618	0.0139	1.01439	0.842
235.0	1.846	50.6	2.26	134.0	0.00579	0.00797	0.629	0.0147	1.01397	0.832
240.0	1.794	52.1	2.26	136.0	0.00555	0.00809	0.639	0.0156	1.01358	0.823
245.0	1.746	53.6	2.26	137.0	0.00534	0.00821	0.650	0.0164	1.01321	0.816
250.0	1.701	55.1	2.26	138.0	0.00514	0.00833	0.661	0.0173	1.01287	0.809
255.0	1.658	56.6	2.25	138.0	0.00497	0.00845	0.672	0.0181	1.01254	0.804
260.0	1.618	58.1	2.25	139.0	0.00480	0.00858	0.682	0.0190	1.01224	0.798
265.0	1.581	59.5	2.25	140.0	0.00465	0.00870	0.693	0.0199	1.01195	0.794
270.0	1.545	61.0	2.25	141.0	0.00451	0.00883	0.704	0.0208	1.01168	0.790
275.0	1.511	62.4	2.25	141.0	0.00438	0.00895	0.714	0.0217	1.01142	0.786
280.0	1.479	63.8	2.25	142.0	0.00426	0.00908	0.725	0.0226	1.01118	0.782
285.0	1.448	65.2	2.25	142.0	0.00415	0.00920	0.736	0.0235	1.01095	0.779
290.0	1.419	66.7	2.24	143.0	0.00404	0.00933	0.746	0.0244	1.01072	0.776
295.0	1.391	68.1	2.24	143.0	0.00394	0.00945	0.757	0.0253	1.01051	0.773
300.0	1.364	69.5	2.24	144.0	0.00385	0.00958	0.767	0.0263	1.01031	0.771
310.0	1.313	72.2	2.24	144.0	0.00368	0.00983	0.788	0.0282	1.00992	0.766
320.0	1.267	75.0	2.24	145.0	0.00352	0.0101	0.809	0.0302	1.00957	0.762
330.0	1.224	77.7	2.23	145.0	0.00338	0.0103	0.830	0.0322	1.00925	0.759
340.0	1.184	80.4	2.23	146.0	0.00325	0.0106	0.850	0.0342	1.00894	0.756
350.0	1.147	83.1	2.23	146.0	0.00313	0.0108	0.871	0.0363	1.00866	0.753
360.0	1.112	85.8	2.23	147.0	0.00302	0.0111	0.891	0.0384	1.00840	0.751
370.0	1.080	88.5	2.23	147.0	0.00292	0.0113	0.911	0.0406	1.00815	0.748
380.0	1.049	91.2	2.22	147.0	0.00283	0.0116	0.930	0.0428	1.00792	0.746
390.0	1.020	93.8	2.22	148.0	0.00274	0.0118	0.950	0.0450	1.00770	0.745
400.0	0.9930	96.5	2.22	148.0	0.00266	0.0121	0.969	0.0473	1.00750	0.743
410.0	0.9673	99.1	2.22	148.0	0.00258	0.0123	0.989	0.0496	1.00730	0.742
420.0	0.9430	102.0	2.22	148.0	0.00251	0.0125	1.01	0.0520	1.00712	0.740
430.0	0.9199	104.0	2.21	149.0	0.00245	0.0128	1.03	0.0544	1.00694	0.739
440.0	0.8979	107.0	2.21	149.0	0.00239	0.0130	1.05	0.0568	1.00678	0.738
450.0	0.8771	110.0	2.21	149.0	0.00232	0.0132	1.06	0.0593	1.00662	0.736
460.0	0.8572	112.0	2.21	149.0	0.00227	0.0135	1.08	0.0618	1.00647	0.735
470.0	0.8382	115.0	2.21	149.0	0.00221	0.0137	1.10	0.0644	1.00633	0.734
480.0	0.8201	117.0	2.21	149.0	0.00216	0.0139	1.12	0.0670	1.00619	0.734
490.0	0.8027	120.0	2.21	149.0	0.00211	0.0142	1.14	0.0696	1.00606	0.733
500.0	0.7862	123.0	2.21	149.0	0.00206	0.0144	1.15	0.0722	1.00593	0.732
510.0	0.7703	125.0	2.20	150.0	0.00202	0.0146	1.17	0.0749	1.00581	0.731
520.0	0.7550	128.0	2.20	150.0	0.00198	0.0148	1.19	0.0777	1.00570	0.730
530.0	0.7404	130.0	2.20	150.0	0.00194	0.0150	1.21	0.0804	1.00559	0.730
540.0	0.7263	133.0	2.20	150.0	0.00190	0.0153	1.22	0.0832	1.00548	0.729
550.0	0.7128	135.0	2.20	150.0	0.00186	0.0155	1.24	0.0861	1.00538	0.728
560.0	0.6998	138.0	2.20	150.0	0.00183	0.0157	1.26	0.0890	1.00528	0.728
570.0	0.6872	141.0	2.20	150.0	0.00179	0.0159	1.27	0.0919	1.00518	0.727
580.0	0.6751	143.0	2.20	150.0	0.00176	0.0161	1.29	0.0948	1.00509	0.727
590.0	0.6635	146.0	2.19	150.0	0.00173	0.0163	1.31	0.0978	1.00500	0.726
600.0	0.6522	148.0	2.19	150.0	0.00170	0.0165	1.32	0.101	1.00492	0.725
700.0	0.5579	174.0	2.18	150.0	0.00144	0.0186	1.48	0.133	1.00421	0.721
800.0	0.4876	200.0	2.16	151.0	0.00125	0.0206	1.63	0.167	1.00368	0.718
900.0	0.4333	227.0	2.14	151.0	0.00111	0.0225	1.77	0.205	1.00327	0.716
1000.0	0.3899	255.0	2.11	151.0	0.00100	0.0244	1.90	0.245	1.00294	0.715
1500.0	0.2600	406.0	1.94	151.0	0.000665					
2000.0	0.1951	569.0	1.81	150.0	0.000499					
2500.0	0.1562	735.0	1.73	150.0	0.000399					
3000.0	0.1302	903.0	1.67	150.0	0.000333					
3500.0	0.1117	1070.0	1.64	150.0	0.000285					

* TWO-PHASE BOUNDARY

200 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01848	1950.0	249.0	-64.24	-63.56	0.5841	0.2372	0.4681	4221.0
120.0	0.01871	1680.0	224.0	-61.88	-61.19	0.6042	0.2458	0.4786	3888.0
125.0	0.01895	1460.0	203.0	-59.48	-58.78	0.6239	0.2478	0.4840	3630.0
130.0	0.01921	1280.0	186.0	-57.06	-56.35	0.6429	0.2466	0.4666	3417.0
135.0	0.01949	1130.0	170.0	-54.64	-53.91	0.6613	0.2438	0.4881	3235.0
140.0	0.01973	1000.0	157.0	-52.20	-51.47	0.6791	0.2405	0.4894	3073.0
145.0	0.02010	892.0	144.0	-49.76	-49.02	0.6963	0.2372	0.4910	2925.0
150.0	0.02044	796.0	133.0	-47.32	-46.56	0.7130	0.2342	0.4936	2787.0
155.0	0.02080	709.0	123.0	-44.85	-44.08	0.7292	0.2317	0.4973	2656.0
160.0	0.02119	631.0	114.0	-42.37	-41.59	0.7451	0.2295	0.5024	2529.0
165.0	0.02161	559.0	105.0	-39.86	-39.05	0.7607	0.2277	0.5093	2406.0
170.0	0.02207	492.0	96.8	-37.30	-36.49	0.7760	0.2263	0.5182	2285.0
175.0	0.02258	430.0	89.0	-34.70	-33.87	0.7912	0.2252	0.5295	2164.0
180.0	0.02313	372.0	81.6	-32.04	-31.19	0.8063	0.2243	0.5440	2044.0
185.0	0.02375	317.0	74.5	-29.30	-28.42	0.8214	0.2237	0.5628	1921.0
190.0	0.02447	264.0	67.6	-26.45	-25.55	0.8367	0.2234	0.5877	1795.0
* 196.100	0.02550	203.0	59.3	-22.79	-21.84	0.8559	0.2234	0.6325	1633.0
* 196.100	0.2751	36.1	1.77	27.15	37.34	1.158	0.2127	0.4526	596.4
200.0	0.2891	40.1	1.66	28.33	39.04	1.166	0.2085	0.4205	612.0
205.0	0.3057	44.7	1.54	29.74	41.06	1.176	0.2042	0.3912	630.0
210.0	0.3213	49.0	1.44	31.06	42.96	1.186	0.2008	0.3699	646.5
215.0	0.3361	52.9	1.35	32.32	44.77	1.194	0.1980	0.3538	661.7
220.0	0.3503	56.6	1.26	33.54	46.51	1.202	0.1956	0.3410	676.0
225.0	0.3639	60.1	1.22	34.71	48.19	1.210	0.1936	0.3307	689.6
230.0	0.3772	63.4	1.17	35.85	49.82	1.217	0.1919	0.3222	702.4
235.0	0.3902	66.7	1.12	36.96	51.41	1.224	0.1905	0.3151	714.8
240.0	0.4028	69.8	1.08	38.05	52.97	1.230	0.1892	0.3091	726.6
245.0	0.4152	72.8	1.04	39.13	54.50	1.236	0.1881	0.3039	738.0
250.0	0.4274	75.7	1.00	40.18	56.01	1.243	0.1872	0.2994	749.0
255.0	0.4394	78.6	0.970	41.22	57.50	1.248	0.1863	0.2955	759.7
260.0	0.4512	81.4	0.940	42.25	58.97	1.254	0.1856	0.2920	770.1
265.0	0.4629	84.1	0.912	43.27	60.42	1.260	0.1849	0.2890	780.2
270.0	0.4745	86.8	0.886	44.28	61.86	1.265	0.1844	0.2862	790.1
275.0	0.4859	89.4	0.862	45.28	63.28	1.270	0.1838	0.2838	799.7
280.0	0.4973	92.0	0.840	46.28	64.70	1.275	0.1834	0.2816	809.2
285.0	0.5085	94.6	0.819	47.27	66.10	1.280	0.1829	0.2796	818.4
290.0	0.5196	97.1	0.799	48.25	67.49	1.285	0.1826	0.2778	827.4
295.0	0.5307	100.0	0.780	49.22	68.88	1.290	0.1822	0.2762	836.3
300.0	0.5417	102.0	0.762	50.19	70.25	1.295	0.1819	0.2747	845.0
310.0	0.5635	107.0	0.729	52.12	72.99	1.304	0.1814	0.2720	862.0
320.0	0.5850	112.0	0.700	54.03	75.70	1.312	0.1809	0.2698	878.5
330.0	0.6064	116.0	0.673	55.93	78.38	1.320	0.1805	0.2679	894.4
340.0	0.6275	121.0	0.648	57.81	81.05	1.328	0.1802	0.2662	910.0
350.0	0.6485	126.0	0.625	59.69	83.71	1.336	0.1799	0.2648	925.2
360.0	0.6694	130.0	0.604	61.56	86.35	1.344	0.1797	0.2635	940.0
370.0	0.6902	135.0	0.584	63.42	88.98	1.351	0.1795	0.2624	954.4
380.0	0.7108	139.0	0.566	65.27	91.60	1.358	0.1793	0.2613	968.6
390.0	0.7313	143.0	0.549	67.12	94.21	1.364	0.1792	0.2605	982.5
400.0	0.7518	146.0	0.533	68.96	96.81	1.371	0.1790	0.2597	996.0
410.0	0.7722	152.0	0.518	70.80	99.40	1.377	0.1789	0.2589	1009.0
420.0	0.7925	156.0	0.504	72.64	102.0	1.384	0.1788	0.2583	1023.0
430.0	0.8127	160.0	0.491	74.47	104.6	1.390	0.1787	0.2577	1036.0
440.0	0.8329	165.0	0.478	76.29	107.1	1.396	0.1786	0.2571	1048.0
450.0	0.8530	169.0	0.467	78.12	109.7	1.401	0.1785	0.2566	1061.0
460.0	0.8731	173.0	0.455	79.94	112.3	1.407	0.1785	0.2562	1073.0
470.0	0.8931	177.0	0.445	81.76	114.8	1.413	0.1784	0.2558	1085.0
480.0	0.9131	181.0	0.434	83.57	117.4	1.418	0.1784	0.2554	1097.0
490.0	0.9330	186.0	0.425	85.39	119.9	1.423	0.1783	0.2551	1109.0
500.0	0.9529	190.0	0.415	87.20	122.5	1.428	0.1783	0.2547	1121.0
510.0	0.9728	194.0	0.407	89.01	125.0	1.433	0.1783	0.2544	1132.0
520.0	0.9926	198.0	0.398	90.82	127.6	1.438	0.1782	0.2542	1144.0
530.0	1.012	202.0	0.390	92.62	130.1	1.443	0.1782	0.2539	1155.0
540.0	1.032	206.0	0.382	94.43	132.7	1.448	0.1782	0.2537	1166.0
550.0	1.052	210.0	0.375	96.23	135.2	1.453	0.1782	0.2535	1177.0
560.0	1.072	214.0	0.368	98.04	137.7	1.457	0.1782	0.2533	1188.0
570.0	1.091	218.0	0.361	99.8	140.3	1.462	0.1782	0.2531	1199.0
580.0	1.111	222.0	0.354	101.6	142.8	1.466	0.1782	0.2530	1209.0
590.0	1.131	226.0	0.348	103.4	145.3	1.470	0.1782	0.2528	1220.0
600.0	1.150	230.0	0.342	105.2	147.3	1.475	0.1782	0.2527	1230.0
700.0	1.346	270.0	0.291	123.2	173.1	1.514	0.1787	0.2520	1329.0
800.0	1.540	310.0	0.253	141.3	198.3	1.547	0.1798	0.2525	1419.0
900.0	1.734	349.0	0.224	159.4	223.6	1.577	0.1815	0.2537	1503.0
1000.0	1.927	388.0	0.201	177.7	249.1	1.604	0.1837	0.2557	1581.0
1500.0	2.888	581.0	0.134	273.4	380.3	1.710	0.1988	0.2701	1912.0
2000.0	3.847	773.0	0.100	376.5	513.9	1.790	0.2126	0.2837	2186.0
2500.0	4.806	965.0	0.0800	485.4	663.4	1.854	0.2225	0.2935	2428.0
3000.0	5.764	1160.0	0.0667	598.5	811.9	1.908	0.2293	0.3003	2649.0
3500.0	6.721	1350.0	0.0571	714.4	963.3	1.955	0.2341	0.3050	2853.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

200 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.10	198.0	19.4	105000.0	0.00236	0.0945	20.3	0.00373	1.46626	3.62
120.0	53.45	191.0	17.0	89500.0	0.00250	0.0914	17.2	0.00357	1.45998	3.24
125.0	52.77	183.0	15.6	76800.0	0.00265	0.0883	14.9	0.00346	1.45343	2.95
130.0	52.05	174.0	14.5	66500.0	0.00279	0.0852	13.3	0.00336	1.44662	2.74
135.0	51.31	166.0	13.6	57900.0	0.00294	0.0821	12.1	0.00328	1.43955	2.60
140.0	50.54	158.0	12.9	50600.0	0.00310	0.0790	11.1	0.00319	1.43224	2.48
145.0	49.75	151.0	12.2	44400.0	0.00326	0.0759	10.1	0.00311	1.42468	2.34
150.0	48.92	144.0	11.6	38900.0	0.00343	0.0729	9.29	0.00302	1.41689	2.26
155.0	48.07	138.0	11.1	34100.0	0.00361	0.0699	8.58	0.00292	1.40885	2.20
160.0	47.19	131.0	10.5	29800.0	0.00382	0.0669	7.91	0.00282	1.40053	2.14
165.0	46.27	125.0	10.0	25800.0	0.00406	0.0640	7.29	0.00272	1.39191	2.09
170.0	45.31	119.0	9.44	22300.0	0.00434	0.0611	6.70	0.00260	1.38294	2.05
175.0	44.30	113.0	8.93	19000.0	0.00467	0.0582	6.15	0.00248	1.37355	2.01
180.0	43.23	107.0	8.42	16100.0	0.00508	0.0553	5.62	0.00235	1.36368	1.99
185.0	42.10	101.0	7.91	13300.0	0.00559	0.0524	5.12	0.00221	1.35319	1.98
190.0	40.87	93.9	7.41	10800.0	0.00626	0.0494	4.64	0.00206	1.34194	1.99
* 196.100	39.21	85.0	6.77	7970.0	0.00745	0.0457	4.07	0.00184	1.32678	2.03
* 196.100	3.635	33.4	2.30	131.0	0.0135	0.00772	0.571	0.00469	1.02765	1.21
200.0	3.459	35.2	2.30	139.0	0.0119	0.00774	0.577	0.00532	1.02629	1.13
205.0	3.271	37.3	2.30	146.0	0.0105	0.00779	0.586	0.00609	1.02485	1.06
210.0	3.112	39.2	2.30	152.0	0.00943	0.00786	0.594	0.00683	1.02364	1.01
215.0	2.975	41.1	2.30	157.0	0.00860	0.00794	0.604	0.00754	1.02259	0.968
220.0	2.855	42.9	2.30	162.0	0.00794	0.00803	0.613	0.00825	1.02167	0.938
225.0	2.748	44.7	2.30	165.0	0.00740	0.00812	0.623	0.00894	1.02085	0.914
230.0	2.651	46.4	2.30	168.0	0.00694	0.00822	0.633	0.00962	1.02011	0.894
235.0	2.563	48.1	2.29	171.0	0.00655	0.00832	0.643	0.0103	1.01944	0.877
240.0	2.483	49.7	2.29	173.0	0.00622	0.00842	0.654	0.0110	1.01882	0.863
245.0	2.408	51.3	2.29	175.0	0.00592	0.00853	0.664	0.0117	1.01825	0.852
250.0	2.340	52.9	2.29	177.0	0.00566	0.00863	0.674	0.0123	1.01773	0.841
255.0	2.276	54.5	2.29	179.0	0.00542	0.00874	0.684	0.0130	1.01724	0.833
260.0	2.216	56.0	2.28	180.0	0.00521	0.00886	0.695	0.0137	1.01679	0.825
265.0	2.160	57.6	2.28	182.0	0.00502	0.00897	0.705	0.0144	1.01636	0.818
270.0	2.108	59.1	2.28	183.0	0.00485	0.00908	0.716	0.0151	1.01596	0.812
275.0	2.059	60.6	2.28	184.0	0.00469	0.00920	0.726	0.0158	1.01558	0.806
280.0	2.011	62.1	2.28	185.0	0.00454	0.00932	0.736	0.0165	1.01523	0.801
285.0	1.967	63.5	2.28	186.0	0.00440	0.00944	0.747	0.0172	1.01489	0.797
290.0	1.924	65.0	2.27	187.0	0.00427	0.00955	0.757	0.0179	1.01457	0.793
295.0	1.884	66.5	2.27	188.0	0.00416	0.00967	0.767	0.0186	1.01426	0.789
300.0	1.846	67.9	2.27	188.0	0.00404	0.00979	0.778	0.0193	1.01397	0.785
310.0	1.775	70.8	2.27	190.0	0.00384	0.0100	0.798	0.0208	1.01343	0.779
320.0	1.709	73.6	2.26	191.0	0.00366	0.0103	0.819	0.0223	1.01293	0.774
330.0	1.649	76.4	2.26	192.0	0.00350	0.0105	0.839	0.0238	1.01247	0.769
340.0	1.594	79.2	2.26	193.0	0.00336	0.0108	0.859	0.0254	1.01205	0.765
350.0	1.542	82.0	2.25	194.0	0.00323	0.0110	0.879	0.0270	1.01166	0.761
360.0	1.494	84.8	2.25	194.0	0.00311	0.0112	0.899	0.0286	1.01129	0.758
370.0	1.449	87.5	2.25	195.0	0.00300	0.0115	0.919	0.0302	1.01095	0.755
380.0	1.407	90.2	2.24	195.0	0.00290	0.0117	0.938	0.0319	1.01063	0.753
390.0	1.367	92.9	2.24	196.0	0.00280	0.0120	0.958	0.0336	1.01033	0.750
400.0	1.330	95.6	2.24	196.0	0.00272	0.0122	0.977	0.0353	1.01005	0.748
410.0	1.295	98.3	2.24	197.0	0.00263	0.0124	1.00	0.0371	1.00979	0.746
420.0	1.262	101.0	2.23	197.0	0.00256	0.0127	1.01	0.0389	1.00953	0.745
430.0	1.230	104.0	2.23	197.0	0.00249	0.0129	1.03	0.0407	1.00930	0.743
440.0	1.201	106.0	2.23	198.0	0.00242	0.0131	1.05	0.0425	1.00907	0.742
450.0	1.172	109.0	2.23	198.0	0.00236	0.0134	1.07	0.0444	1.00886	0.740
460.0	1.145	112.0	2.23	198.0	0.00230	0.0136	1.09	0.0463	1.00865	0.739
470.0	1.120	114.0	2.23	199.0	0.00224	0.0138	1.11	0.0482	1.00846	0.738
480.0	1.095	117.0	2.22	199.0	0.00219	0.0140	1.12	0.0502	1.00827	0.737
490.0	1.072	119.0	2.22	199.0	0.00213	0.0143	1.14	0.0522	1.00809	0.736
500.0	1.049	122.0	2.22	199.0	0.00209	0.0145	1.16	0.0542	1.00792	0.735
510.0	1.028	125.0	2.22	199.0	0.00204	0.0147	1.18	0.0562	1.00776	0.734
520.0	1.007	127.0	2.22	199.0	0.00200	0.0149	1.20	0.0583	1.00761	0.733
530.0	0.9878	130.0	2.22	200.0	0.00195	0.0151	1.21	0.0604	1.00746	0.732
540.0	0.9688	133.0	2.21	200.0	0.00191	0.0154	1.23	0.0625	1.00731	0.731
550.0	0.9507	135.0	2.21	200.0	0.00183	0.0156	1.25	0.0646	1.00718	0.730
560.0	0.9332	138.0	2.21	200.0	0.00184	0.0158	1.26	0.0668	1.00704	0.730
570.0	0.9163	140.0	2.21	200.0	0.00180	0.0160	1.28	0.0690	1.00692	0.729
580.0	0.9001	143.0	2.21	200.0	0.00177	0.0162	1.30	0.0712	1.00679	0.728
590.0	0.8845	146.0	2.21	200.0	0.00174	0.0164	1.31	0.0734	1.00668	0.728
600.0	0.8694	148.0	2.20	200.0	0.00171	0.0166	1.33	0.0757	1.00656	0.727
700.0	0.7431	174.0	2.19	201.0	0.00145	0.0187	1.49	0.100	1.00561	0.722
800.0	0.6494	201.0	2.17	201.0	0.00126	0.0206	1.63	0.126	1.00490	0.719
900.0	0.5769	228.0	2.14	201.0	0.00111	0.0226	1.77	0.154	1.00435	0.717
1000.0	0.5190	255.0	2.11	201.0	0.00100	0.0245	1.90	0.184	1.00391	0.715
1500.0	0.3462	406.0	1.94	201.0	0.000665					
2000.0	0.2599	569.0	1.81	201.0	0.000498					
2500.0	0.2081	736.0	1.73	201.0	0.000399					
3000.0	0.1735	903.0	1.68	201.0	0.000332					
3500.0	0.1488	1070.0	1.64	201.0	0.000285					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

250 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01847	1960.0	249.0	-64.29	-63.43	0.5837	0.2385	0.4675	4216.0
120.0	0.01870	1680.0	224.0	-61.93	-61.07	0.6038	0.2470	0.4779	3886.0
125.0	0.01894	1470.0	203.0	-59.54	-58.66	0.6234	0.2490	0.4832	3630.0
130.0	0.01920	1290.0	186.0	-57.13	-56.24	0.6424	0.2477	0.4858	3419.0
135.0	0.01947	1140.0	171.0	-54.71	-53.80	0.6608	0.2448	0.4872	3238.0
140.0	0.01977	1010.0	157.0	-52.28	-51.37	0.6785	0.2414	0.4883	3077.0
145.0	0.02008	901.0	145.0	-49.85	-48.92	0.6957	0.2381	0.4899	2931.0
150.0	0.02041	805.0	134.0	-47.41	-46.47	0.7123	0.2350	0.4922	2794.0
155.0	0.02077	718.0	124.0	-44.96	-44.00	0.7285	0.2324	0.4957	2665.0
160.0	0.02115	640.0	114.0	-42.49	-41.51	0.7443	0.2302	0.5006	2540.0
165.0	0.02157	568.0	106.0	-39.99	-38.99	0.7598	0.2283	0.5071	2418.0
170.0	0.02202	502.0	97.4	-37.45	-36.43	0.7751	0.2269	0.5155	2299.0
175.0	0.02252	440.0	89.7	-34.87	-33.83	0.7902	0.2257	0.5262	2180.0
180.0	0.02305	382.0	82.4	-32.23	-31.17	0.8052	0.2248	0.5397	2062.0
185.0	0.02367	327.0	75.4	-29.52	-28.43	0.8202	0.2241	0.5570	1942.0
190.0	0.02435	276.0	68.6	-26.71	-25.59	0.8354	0.2237	0.5798	1819.0
200.0	0.02611	178.0	55.2	-20.66	-19.45	0.8668	0.2239	0.6572	1554.0
* 203.100	0.02682	148.0	50.9	-18.59	-17.35	0.8773	0.2243	0.6999	1461.0
* 203.100	0.2128	30.6	2.40	26.50	36.35	1.142	0.2192	0.5395	590.9
205.0	0.2193	33.0	2.30	27.19	37.34	1.146	0.2165	0.5090	599.8
210.0	0.2351	38.7	2.09	28.85	39.73	1.158	0.2106	0.4526	621.1
215.0	0.2493	43.8	1.93	30.36	41.90	1.168	0.2060	0.4160	639.9
220.0	0.2625	48.3	1.80	31.76	43.91	1.177	0.2024	0.3901	657.0
225.0	0.2750	52.5	1.69	33.08	45.81	1.186	0.1994	0.3707	672.7
230.0	0.2869	56.5	1.60	34.34	47.63	1.194	0.1969	0.3556	687.4
235.0	0.2984	60.2	1.52	35.56	49.37	1.201	0.1948	0.3435	701.3
240.0	0.3094	63.7	1.45	36.74	51.07	1.209	0.1931	0.3336	714.4
245.0	0.3202	67.1	1.39	37.89	52.71	1.215	0.1915	0.3254	727.0
250.0	0.3307	70.4	1.34	39.01	54.32	1.222	0.1902	0.3184	739.0
255.0	0.3409	73.6	1.29	40.12	55.90	1.228	0.1891	0.3125	750.6
260.0	0.3510	76.6	1.24	41.20	57.45	1.234	0.1881	0.3073	761.8
265.0	0.3609	79.6	1.20	42.27	58.97	1.240	0.1872	0.3028	772.6
270.0	0.3706	82.6	1.16	43.32	60.48	1.246	0.1864	0.2988	783.1
275.0	0.3802	85.4	1.13	44.36	61.96	1.251	0.1857	0.2953	793.3
280.0	0.3897	88.2	1.10	45.39	63.43	1.256	0.1851	0.2922	803.3
285.0	0.3991	90.9	1.07	46.41	64.89	1.261	0.1845	0.2894	813.0
290.0	0.4084	93.6	1.04	47.42	66.33	1.267	0.1840	0.2869	822.5
295.0	0.4176	96.3	1.01	48.42	67.76	1.271	0.1836	0.2846	831.8
300.0	0.4267	98.9	0.986	49.42	69.17	1.276	0.1831	0.2826	840.9
310.0	0.4447	104.0	0.941	51.39	71.98	1.285	0.1824	0.2790	858.6
320.0	0.4625	109.0	0.900	53.35	74.75	1.294	0.1819	0.2760	875.7
330.0	0.4800	114.0	0.863	55.28	77.50	1.303	0.1814	0.2734	892.2
340.0	0.4974	119.0	0.830	57.20	80.22	1.311	0.1810	0.2712	908.2
350.0	0.5146	124.0	0.799	59.10	82.93	1.319	0.1806	0.2693	923.8
360.0	0.5316	128.0	0.771	61.00	85.61	1.326	0.1803	0.2676	939.0
370.0	0.5485	133.0	0.745	62.88	88.28	1.333	0.1800	0.2661	953.8
380.0	0.5654	137.0	0.721	64.76	90.93	1.341	0.1798	0.2648	968.2
390.0	0.5821	142.0	0.698	66.63	93.58	1.347	0.1796	0.2637	982.4
400.0	0.5987	146.0	0.677	68.49	96.21	1.354	0.1794	0.2626	996.0
410.0	0.6153	151.0	0.658	70.35	98.83	1.361	0.1793	0.2617	1010.0
420.0	0.6317	155.0	0.639	72.20	101.4	1.367	0.1792	0.2609	1023.0
430.0	0.6481	160.0	0.622	74.04	104.0	1.373	0.1790	0.2601	1036.0
440.0	0.6645	164.0	0.606	75.88	106.6	1.379	0.1789	0.2594	1049.0
450.0	0.6808	168.0	0.590	77.72	109.2	1.385	0.1788	0.2588	1062.0
460.0	0.6970	172.0	0.575	79.55	111.8	1.390	0.1788	0.2582	1074.0
470.0	0.7132	177.0	0.562	81.38	114.4	1.396	0.1787	0.2577	1087.0
480.0	0.7293	181.0	0.548	83.21	117.0	1.401	0.1786	0.2572	1099.0
490.0	0.7454	185.0	0.536	85.04	119.5	1.407	0.1786	0.2568	1111.0
500.0	0.7615	189.0	0.524	86.86	122.1	1.412	0.1785	0.2564	1122.0
510.0	0.7775	194.0	0.513	88.68	124.7	1.417	0.1785	0.2560	1134.0
520.0	0.7935	198.0	0.502	90.49	127.2	1.422	0.1784	0.2556	1146.0
530.0	0.8095	202.0	0.491	92.31	129.8	1.427	0.1784	0.2553	1157.0
540.0	0.8254	206.0	0.481	94.12	132.3	1.432	0.1784	0.2550	1168.0
550.0	0.8413	210.0	0.472	95.94	134.9	1.436	0.1784	0.2548	1179.0
560.0	0.8572	214.0	0.463	97.75	137.4	1.441	0.1784	0.2545	1190.0
570.0	0.8731	218.0	0.454	99.6	140.0	1.445	0.1783	0.2543	1201.0
580.0	0.8889	222.0	0.445	101.4	142.5	1.450	0.1783	0.2541	1212.0
590.0	0.9047	226.0	0.437	103.2	145.1	1.454	0.1784	0.2539	1222.0
600.0	0.9205	231.0	0.430	105.0	147.6	1.458	0.1784	0.2537	1233.0
700.0	1.078	271.0	0.365	123.0	172.9	1.497	0.1788	0.2528	1332.0
800.0	1.234	310.0	0.317	141.1	198.2	1.531	0.1799	0.2530	1422.0
900.0	1.389	350.0	0.281	159.2	223.5	1.561	0.1816	0.2541	1506.0
1000.0	1.544	389.0	0.252	177.6	249.0	1.588	0.1838	0.2560	1584.0
1500.0	2.314	582.0	0.167	273.3	380.4	1.694	0.1989	0.2702	1915.0
2000.0	3.081	775.0	0.125	376.4	513.1	1.774	0.2126	0.2838	2188.0
2500.0	3.848	966.0	0.100	485.4	663.5	1.838	0.2225	0.2935	2430.0
3000.0	4.615	1160.0	0.0833	598.5	812.1	1.892	0.2293	0.3003	2651.0
3500.0	5.381	1350.0	0.0714	714.4	963.5	1.939	0.2341	0.3050	2855.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

250 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DU)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.13	199.0	19.2	106000.0	0.00234	0.0946	20.4	0.00374	1.46650	3.63
120.0	53.48	192.0	16.9	90100.0	0.00245	0.0915	17.3	0.00358	1.46027	3.26
125.0	52.80	184.0	15.5	77400.0	0.00263	0.0885	15.0	0.00347	1.45376	2.95
130.0	52.09	175.0	14.4	67000.0	0.00277	0.0854	13.4	0.00337	1.44699	2.74
135.0	51.36	167.0	13.6	58400.0	0.00292	0.0823	12.2	0.00329	1.43997	2.60
140.0	50.59	159.0	12.9	51100.0	0.00307	0.0792	11.2	0.00321	1.43271	2.48
145.0	49.80	152.0	12.2	44900.0	0.00323	0.0761	10.1	0.00312	1.42521	2.34
150.0	48.99	145.0	11.6	39400.0	0.00334	0.0731	9.35	0.00303	1.41748	2.26
155.0	48.14	139.0	11.0	34600.0	0.00357	0.0701	8.63	0.00294	1.40951	2.20
160.0	47.26	133.0	10.5	30300.0	0.00378	0.0672	7.97	0.00284	1.40127	2.14
165.0	46.35	127.0	10.0	26300.0	0.00401	0.0643	7.35	0.00273	1.39274	2.09
170.0	45.41	121.0	9.46	22800.0	0.00427	0.0614	6.76	0.00262	1.38387	2.04
175.0	44.41	115.0	8.95	19500.0	0.00453	8.0585	6.21	0.00250	1.37462	2.01
180.0	43.36	105.0	8.45	16600.0	0.00497	0.0557	5.69	0.00238	1.36490	1.99
185.0	42.25	102.0	7.96	13800.0	0.00545	0.0528	5.19	0.00224	1.35462	1.97
190.0	41.06	95.7	7.47	11300.0	0.00606	0.0499	4.71	0.00210	1.34364	1.97
200.0	38.30	81.0	6.44	6800.0	0.00812	0.0439	3.80	0.00174	1.31847	2.05
* 203.100	37.28	75.6	6.09	5510.0	0.00925	0.0419	3.51	0.00161	1.30927	2.11
* 203.100	4.699	32.4	2.33	144.0	0.0167	0.00862	0.610	0.00340	1.03584	1.37
205.0	4.560	33.3	2.33	151.0	0.0153	0.00858	0.611	0.00370	1.03477	1.31
210.0	4.254	35.7	2.33	165.0	0.0127	0.00854	0.617	0.00443	1.03241	1.18
215.0	4.011	37.9	2.33	176.0	0.0110	0.00854	0.625	0.00512	1.03054	1.10
220.0	3.809	40.0	2.33	184.0	0.00976	0.00856	0.633	0.00576	1.02838	1.04
225.0	3.636	41.9	2.33	191.0	0.00885	0.00861	0.641	0.00639	1.02765	0.994
230.0	3.485	43.8	2.33	197.0	0.00812	0.00867	0.650	0.00699	1.02650	0.960
235.0	3.352	45.6	2.33	202.0	0.00753	0.00874	0.659	0.00759	1.02547	0.933
240.0	3.232	47.4	2.33	206.0	0.00704	0.00881	0.669	0.00817	1.02455	0.912
245.0	3.123	49.1	2.32	210.0	0.00663	0.00889	0.678	0.00875	1.02372	0.894
250.0	3.024	50.8	2.32	213.0	0.00627	0.00898	0.688	0.00932	1.02296	0.878
255.0	2.933	52.4	2.32	216.0	0.00596	0.00907	0.698	0.00990	1.02227	0.865
260.0	2.849	54.1	2.32	218.0	0.00568	0.00917	0.708	0.0105	1.02162	0.854
265.0	2.771	55.7	2.31	221.0	0.00544	0.00926	0.718	0.0110	1.02102	0.845
270.0	2.698	57.3	2.31	223.0	0.00522	0.00936	0.728	0.0116	1.02047	0.836
275.0	2.630	58.8	2.31	225.0	0.00502	0.00947	0.738	0.0122	1.01995	0.829
280.0	2.566	60.4	2.31	226.0	0.00484	0.00957	0.748	0.0128	1.01946	0.822
285.0	2.506	61.9	2.30	228.0	0.00468	0.00968	0.758	0.0134	1.01900	0.816
290.0	2.449	63.4	2.30	229.0	0.00452	0.00979	0.768	0.0139	1.01856	0.810
295.0	2.395	64.9	2.30	231.0	0.00439	0.00990	0.778	0.0145	1.01815	0.805
300.0	2.344	66.4	2.30	232.0	0.00425	0.0100	0.788	0.0151	1.01776	0.800
310.0	2.249	69.4	2.29	234.0	0.00402	0.0102	0.808	0.0163	1.01704	0.792
320.0	2.162	72.3	2.29	236.0	0.00382	0.0105	0.828	0.0176	1.01638	0.785
330.0	2.083	75.2	2.28	237.0	0.00363	0.0107	0.848	0.0188	1.01578	0.779
340.0	2.011	78.1	2.28	239.0	0.00347	0.0109	0.868	0.0201	1.01522	0.774
350.0	1.943	80.9	2.28	240.0	0.00333	0.0112	0.888	0.0214	1.01471	0.769
360.0	1.881	83.7	2.27	241.0	0.00320	0.0114	0.907	0.0227	1.01424	0.765
370.0	1.823	86.5	2.27	242.0	0.00308	0.0117	0.927	0.0240	1.01380	0.762
380.0	1.769	89.3	2.27	243.0	0.00297	0.0119	0.946	0.0254	1.01338	0.759
390.0	1.718	92.1	2.26	244.0	0.00286	0.0121	0.965	0.0268	1.01300	0.756
400.0	1.670	94.8	2.26	244.0	0.00277	0.0124	0.984	0.0282	1.01263	0.753
410.0	1.625	97.5	2.26	245.0	0.00268	0.0126	1.00	0.0296	1.01229	0.751
420.0	1.583	100.0	2.25	246.0	0.00260	0.0128	1.02	0.0310	1.01197	0.743
430.0	1.543	103.0	2.25	246.0	0.00253	0.0130	1.04	0.0325	1.01167	0.747
440.0	1.505	106.0	2.25	247.0	0.00246	0.0133	1.06	0.0340	1.01138	0.745
450.0	1.469	108.0	2.25	247.0	0.00239	0.0135	1.08	0.0355	1.01111	0.744
460.0	1.435	111.0	2.24	247.0	0.00233	0.0137	1.10	0.0370	1.01085	0.742
470.0	1.402	114.0	2.24	248.0	0.00227	0.0139	1.11	0.0386	1.01060	0.741
480.0	1.371	116.0	2.24	248.0	0.00221	0.0142	1.13	0.0402	1.01036	0.740
490.0	1.342	119.0	2.24	248.0	0.00216	0.0144	1.15	0.0418	1.01014	0.738
500.0	1.313	122.0	2.24	249.0	0.00211	0.0146	1.17	0.0434	1.00992	0.737
510.0	1.286	124.0	2.23	249.0	0.00205	0.0148	1.18	0.0450	1.00972	0.736
520.0	1.260	127.0	2.23	249.0	0.00201	0.0150	1.20	0.0467	1.00952	0.735
530.0	1.235	130.0	2.23	249.0	0.00197	0.0153	1.22	0.0483	1.00933	0.734
540.0	1.212	132.0	2.23	250.0	0.00193	0.0155	1.24	0.0501	1.00915	0.733
550.0	1.189	135.0	2.23	250.0	0.00189	0.0157	1.25	0.0518	1.00898	0.732
560.0	1.167	137.0	2.22	250.0	0.00185	0.0159	1.27	0.0535	1.00881	0.732
570.0	1.145	140.0	2.22	250.0	0.00182	0.0161	1.29	0.0553	1.00865	0.731
580.0	1.125	143.0	2.22	250.0	0.00178	0.0163	1.30	0.0571	1.00850	0.730
590.0	1.105	145.0	2.22	250.0	0.00175	0.0165	1.32	0.0589	1.00835	0.729
600.0	1.086	148.0	2.22	250.0	0.00172	0.0167	1.33	0.0607	1.00820	0.729
700.0	0.9230	174.0	2.20	251.0	0.00145	0.0187	1.49	0.0799	1.00700	0.723
800.0	0.8106	201.0	2.18	252.0	0.00126	0.0207	1.64	0.101	1.00612	0.720
900.0	0.7200	228.0	2.15	252.0	0.00112	0.0226	1.77	0.124	1.00543	0.717
1000.0	0.6478	256.0	2.12	252.0	0.00100	0.0245	1.90	0.148	1.00489	0.715
1500.0	0.4322	407.0	1.94	252.0	0.000664					
2000.0	0.3245	570.0	1.81	251.0	0.000498					
2500.0	0.2599	737.0	1.73	251.0	0.000398					
3000.0	0.2167	904.0	1.68	251.0	0.000332					
3500.0	0.1858	1070.0	1.64	251.0	0.000285					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

300 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01847	1970.0	248.0	-64.33	-63.31	0.5833	0.2399	0.4668	4212.0
120.0	0.01869	1690.0	224.0	-61.98	-60.94	0.6034	0.2482	0.4772	3884.0
125.0	0.01893	1470.0	203.0	-59.59	-58.54	0.6230	0.2502	0.4824	3630.0
130.0	0.01918	1300.0	186.0	-57.19	-56.12	0.6419	0.2487	0.4849	3420.0
135.0	0.01945	1150.0	171.0	-54.78	-53.70	0.6603	0.2458	0.4863	3241.0
140.0	0.01975	1020.0	157.0	-52.36	-51.26	0.6780	0.2423	0.4873	3082.0
145.0	0.02006	910.0	145.0	-49.94	-48.82	0.6951	0.2389	0.4888	2937.0
150.0	0.02039	814.0	134.0	-47.51	-46.37	0.7117	0.2358	0.4910	2802.0
155.0	0.02074	728.0	124.0	-45.06	-43.91	0.7279	0.2331	0.4942	2673.0
160.0	0.02112	649.0	115.0	-42.60	-41.43	0.7436	0.2308	0.4988	2550.0
165.0	0.02153	578.0	106.0	-40.12	-38.92	0.7590	0.2289	0.5050	2430.0
170.0	0.02198	512.0	98.0	-37.60	-36.38	0.7742	0.2274	0.5129	2312.0
175.0	0.02246	450.0	90.4	-35.03	-33.79	0.7892	0.2262	0.5230	2195.0
180.0	0.02299	392.0	83.1	-32.42	-31.14	0.8041	0.2252	0.5356	2079.0
185.0	0.02358	338.0	76.2	-29.74	-28.43	0.8190	0.2245	0.5517	1962.0
190.0	0.02425	287.0	69.5	-26.96	-25.62	0.8340	0.2240	0.5725	1842.0
200.0	0.02593	190.0	56.4	-21.03	-19.59	0.8649	0.2239	0.6406	1587.0
205.0	0.02705	143.0	49.7	-17.75	-16.24	0.8814	0.2246	0.7043	1442.0
* 209.200	0.02827	104.0	43.8	-14.70	-13.13	0.8965	0.2259	0.7993	1304.0
* 209.200	0.1695	24.9	3.15	25.51	34.92	1.126	0.2261	0.6701	584.6
210.0	0.1724	26.2	3.08	25.89	35.47	1.129	0.2245	0.6420	589.3
215.0	0.1832	33.2	2.72	27.91	38.37	1.142	0.2167	0.5312	614.4
220.0	0.2019	39.1	2.47	29.64	40.86	1.154	0.2109	0.4700	635.6
225.0	0.2142	44.3	2.28	31.20	43.10	1.164	0.2064	0.4304	654.4
230.0	0.2255	49.0	2.13	32.65	45.18	1.173	0.2028	0.4024	671.4
235.0	0.2363	53.4	2.00	34.01	47.14	1.182	0.1999	0.3815	687.2
240.0	0.2465	57.5	1.89	35.31	49.00	1.189	0.1974	0.3652	701.9
245.0	0.2563	61.3	1.80	36.56	50.79	1.197	0.1953	0.3522	715.8
250.0	0.2657	65.0	1.72	37.77	52.53	1.204	0.1935	0.3416	728.9
255.0	0.2749	68.5	1.64	38.94	54.21	1.210	0.1920	0.3327	741.5
260.0	0.2839	71.9	1.58	40.09	55.86	1.217	0.1907	0.3252	753.5
265.0	0.2926	75.1	1.52	41.21	57.47	1.223	0.1895	0.3187	765.1
270.0	0.3012	78.3	1.47	42.31	59.05	1.229	0.1885	0.3132	776.3
275.0	0.3096	81.4	1.42	43.40	60.60	1.235	0.1876	0.3083	787.2
280.0	0.3179	84.4	1.37	44.47	62.13	1.240	0.1868	0.3040	797.7
285.0	0.3261	87.3	1.33	45.52	63.64	1.245	0.1861	0.3002	807.9
290.0	0.3342	90.2	1.29	46.57	65.13	1.251	0.1855	0.2969	817.9
295.0	0.3421	93.0	1.26	47.60	66.61	1.256	0.1849	0.2938	827.6
300.0	0.3500	95.8	1.23	48.63	68.07	1.261	0.1844	0.2911	837.1
310.0	0.3655	101.0	1.17	50.65	70.96	1.270	0.1835	0.2864	855.5
320.0	0.3808	106.0	1.11	52.65	73.80	1.279	0.1828	0.2825	873.2
330.0	0.3958	112.0	1.06	54.62	76.61	1.288	0.1822	0.2792	890.2
340.0	0.4106	117.0	1.02	56.58	79.39	1.296	0.1817	0.2764	906.7
350.0	0.4253	122.0	0.980	58.51	82.14	1.304	0.1813	0.2740	922.7
360.0	0.4398	126.0	0.944	60.44	84.87	1.312	0.1809	0.2719	938.2
370.0	0.4542	131.0	0.911	62.35	87.58	1.319	0.1806	0.2700	953.3
380.0	0.4684	136.0	0.880	64.24	90.27	1.326	0.1803	0.2684	968.1
390.0	0.4826	141.0	0.852	66.13	92.95	1.333	0.1801	0.2670	982.5
400.0	0.4967	145.0	0.826	68.02	95.61	1.340	0.1799	0.2657	997.0
410.0	0.5107	150.0	0.801	69.89	98.26	1.347	0.1797	0.2645	1010.0
420.0	0.5246	154.0	0.778	71.76	100.9	1.353	0.1795	0.2635	1024.0
430.0	0.5384	159.0	0.756	73.62	103.5	1.359	0.1794	0.2626	1037.0
440.0	0.5522	163.0	0.736	75.47	106.2	1.365	0.1793	0.2617	1050.0
450.0	0.5660	167.0	0.716	77.32	108.8	1.371	0.1791	0.2610	1063.0
460.0	0.5796	172.0	0.698	79.17	111.4	1.377	0.1790	0.2603	1076.0
470.0	0.5933	176.0	0.681	81.01	114.0	1.382	0.1790	0.2596	1088.0
480.0	0.6069	180.0	0.665	82.85	116.6	1.388	0.1789	0.2590	1100.0
490.0	0.6204	185.0	0.649	84.69	119.2	1.393	0.1788	0.2585	1112.0
500.0	0.6339	189.0	0.635	86.52	121.7	1.398	0.1787	0.2580	1124.0
510.0	0.6474	193.0	0.621	88.35	124.3	1.403	0.1787	0.2575	1136.0
520.0	0.6608	198.0	0.607	90.17	126.9	1.408	0.1786	0.2571	1148.0
530.0	0.6742	202.0	0.594	92.00	129.5	1.413	0.1786	0.2567	1159.0
540.0	0.6876	206.0	0.582	93.82	132.0	1.418	0.1786	0.2564	1170.0
550.0	0.7010	210.0	0.570	95.64	134.6	1.423	0.1786	0.2560	1181.0
560.0	0.7143	214.0	0.559	97.46	137.1	1.427	0.1785	0.2557	1192.0
570.0	0.7276	218.0	0.548	99.28	139.7	1.432	0.1785	0.2555	1203.0
580.0	0.7409	223.0	0.538	101.1	142.2	1.436	0.1785	0.2552	1214.0
590.0	0.7541	227.0	0.528	102.9	144.8	1.441	0.1785	0.2550	1225.0
600.0	0.7674	231.0	0.518	104.7	147.3	1.445	0.1785	0.2547	1235.0
700.0	0.8989	271.0	0.439	122.8	172.7	1.484	0.1789	0.2535	1335.0
800.0	1.029	311.0	0.382	140.9	198.1	1.518	0.1799	0.2535	1425.0
900.0	1.159	351.0	0.338	159.1	223.5	1.548	0.1816	0.2545	1509.0
1000.0	1.288	390.0	0.303	177.4	248.8	1.575	0.1839	0.2563	1587.0
1500.0	1.931	584.0	0.201	273.2	380.5	1.681	0.1989	0.2703	1917.0
2000.0	2.571	776.0	0.150	376.4	513.2	1.761	0.2127	0.2836	2191.0
2500.0	3.210	968.0	0.120	485.4	663.7	1.825	0.2225	0.2936	2433.0
3000.0	3.846	1160.0	0.100	598.5	812.3	1.880	0.2294	0.3003	2653.0
3500.0	4.487	1350.0	0.0857	714.4	963.7	1.926	0.2341	0.3050	2856.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

300 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.15	201.0	19.1	107000.0	0.00233	0.0947	20.6	0.00375	1.45675	3.65
120.0	53.51	193.0	16.8	90600.0	0.00247	0.0917	17.4	0.00359	1.46055	3.27
125.0	52.83	185.0	15.4	77900.0	0.00261	0.0886	15.1	0.00348	1.45409	2.96
130.0	52.13	176.0	14.3	67500.0	0.00275	0.0855	13.5	0.00338	1.44736	2.75
135.0	51.40	168.0	13.5	58900.0	0.00290	0.0825	12.3	0.00330	1.44039	2.60
140.0	50.64	160.0	12.8	51600.0	0.00304	0.0794	11.2	0.00322	1.43318	2.48
145.0	49.86	153.0	12.2	45400.0	0.00320	0.0764	10.2	0.00313	1.42574	2.34
150.0	49.05	146.0	11.6	39903.0	0.00336	0.0734	9.40	0.00305	1.41807	2.27
155.0	48.21	140.0	11.0	35100.0	0.00354	0.0704	8.69	0.00295	1.41016	2.20
160.0	47.34	134.0	10.5	30700.0	0.00373	0.0675	8.03	0.00286	1.40200	2.14
165.0	46.44	128.0	10.0	26800.0	0.00395	0.0646	7.40	0.00275	1.39356	2.08
170.0	45.50	122.0	9.47	23300.0	0.00421	0.0617	6.82	0.00264	1.38479	2.04
175.0	44.52	116.0	8.97	20000.0	0.00451	0.0589	6.27	0.00253	1.37566	2.01
180.0	43.49	110.0	8.49	17100.0	0.00487	0.0560	5.75	0.00240	1.36610	1.98
185.0	42.40	104.0	8.00	14300.0	0.00532	0.0532	5.26	0.00227	1.35601	1.96
190.0	41.23	97.4	7.52	11800.0	0.00588	0.0503	4.78	0.00213	1.34527	1.96
200.0	38.57	83.2	6.53	7330.0	0.00770	0.0444	3.88	0.00180	1.32094	2.01
205.0	36.97	75.0	5.99	5290.0	0.00939	0.0414	3.43	0.00159	1.30647	2.10
* 209.200	35.38	66.9	5.48	3670.0	0.0119	0.0387	3.04	0.00137	1.29216	2.26
* 209.200	5.900	31.2	2.36	147.0	0.0215	0.00977	0.649	0.00247	1.04515	1.60
210.0	5.800	31.7	2.36	152.0	0.0202	0.00970	0.649	0.00261	1.04437	1.55
215.0	5.313	34.5	2.36	177.0	0.0154	0.00944	0.651	0.00335	1.04059	1.32
220.0	4.954	36.9	2.37	194.0	0.0127	0.00932	0.656	0.00400	1.03782	1.19
225.0	4.670	39.1	2.37	207.0	0.0110	0.00926	0.662	0.00461	1.03562	1.11
230.0	4.434	41.2	2.36	217.0	0.00973	0.00925	0.669	0.00518	1.03380	1.05
235.0	4.233	43.1	2.36	226.0	0.00884	0.00926	0.677	0.00573	1.03224	1.00
240.0	4.057	45.1	2.36	233.0	0.00811	0.00928	0.685	0.00627	1.03089	0.971
245.0	3.902	46.9	2.36	239.0	0.00751	0.00933	0.694	0.00679	1.02970	0.943
250.0	3.763	48.7	2.36	245.0	0.00701	0.00938	0.703	0.00730	1.02863	0.921
255.0	3.637	50.4	2.35	249.0	0.00659	0.00944	0.712	0.00780	1.02766	0.903
260.0	3.523	52.2	2.35	253.0	0.00623	0.00951	0.721	0.00830	1.02678	0.888
265.0	3.417	53.8	2.35	257.0	0.00592	0.00959	0.731	0.00880	1.02597	0.874
270.0	3.320	55.5	2.34	260.0	0.00564	0.00967	0.740	0.00930	1.02523	0.863
275.0	3.230	57.1	2.34	263.0	0.00540	0.00976	0.750	0.00980	1.02454	0.853
280.0	3.145	58.7	2.34	265.0	0.00518	0.00985	0.760	0.0103	1.02389	0.844
285.0	3.067	60.3	2.33	268.0	0.00498	0.00995	0.769	0.0108	1.02329	0.836
290.0	2.993	61.9	2.33	270.0	0.00479	0.0100	0.779	0.0113	1.02272	0.829
295.0	2.923	63.5	2.33	272.0	0.00463	0.0101	0.789	0.0118	1.02219	0.822
300.0	2.857	65.0	2.33	274.0	0.00448	0.0103	0.799	0.0123	1.02168	0.816
310.0	2.736	68.1	2.32	277.0	0.00421	0.0105	0.818	0.0134	1.02076	0.806
320.0	2.626	71.1	2.32	280.0	0.00397	0.0107	0.838	0.0144	1.01992	0.797
330.0	2.527	74.0	2.31	282.0	0.00377	0.0109	0.857	0.0155	1.01916	0.790
340.0	2.435	77.0	2.30	284.0	0.00359	0.0111	0.877	0.0165	1.01846	0.783
350.0	2.351	79.9	2.30	286.0	0.00343	0.0114	0.896	0.0176	1.01782	0.778
360.0	2.274	82.8	2.30	287.0	0.00328	0.0116	0.915	0.0188	1.01723	0.773
370.0	2.202	85.6	2.29	289.0	0.00315	0.0118	0.935	0.0199	1.01668	0.769
380.0	2.135	88.4	2.29	290.0	0.00303	0.0120	0.954	0.0210	1.01617	0.765
390.0	2.072	91.2	2.28	291.0	0.00293	0.0123	0.973	0.0222	1.01569	0.761
400.0	2.013	94.0	2.28	292.0	0.00283	0.0125	0.991	0.0234	1.01524	0.758
410.0	1.956	96.8	2.28	293.0	0.00273	0.0127	1.01	0.0246	1.01482	0.756
420.0	1.906	100.0	2.27	294.0	0.00265	0.0130	1.03	0.0258	1.01443	0.753
430.0	1.857	102.0	2.27	295.0	0.00257	0.0132	1.05	0.0270	1.01406	0.751
440.0	1.811	105.0	2.27	295.0	0.00249	0.0134	1.07	0.0283	1.01370	0.749
450.0	1.767	108.0	2.26	296.0	0.00242	0.0136	1.08	0.0295	1.01337	0.747
460.0	1.725	110.0	2.26	296.0	0.00236	0.0138	1.10	0.0308	1.01305	0.745
470.0	1.686	113.0	2.26	297.0	0.00229	0.0141	1.12	0.0321	1.01275	0.744
480.0	1.648	116.0	2.26	297.0	0.00224	0.0143	1.14	0.0335	1.01246	0.742
490.0	1.612	119.0	2.25	298.0	0.00218	0.0145	1.15	0.0348	1.01219	0.741
500.0	1.578	121.0	2.25	298.0	0.00213	0.0147	1.17	0.0362	1.01193	0.740
510.0	1.545	124.0	2.25	299.0	0.00208	0.0149	1.19	0.0375	1.01168	0.738
520.0	1.513	127.0	2.25	299.0	0.00203	0.0151	1.21	0.0389	1.01144	0.737
530.0	1.483	129.0	2.24	299.0	0.00199	0.0154	1.22	0.0403	1.01121	0.736
540.0	1.454	132.0	2.24	299.0	0.00194	0.0156	1.24	0.0418	1.01099	0.735
550.0	1.427	135.0	2.24	300.0	0.00190	0.0158	1.26	0.0432	1.01078	0.734
560.0	1.400	137.0	2.24	300.0	0.00186	0.0160	1.27	0.0447	1.01058	0.733
570.0	1.374	140.0	2.23	300.0	0.00183	0.0162	1.29	0.0461	1.01039	0.733
580.0	1.350	142.0	2.23	300.0	0.00179	0.0164	1.31	0.0476	1.01020	0.732
590.0	1.326	145.0	2.23	301.0	0.00176	0.0166	1.32	0.0491	1.01002	0.731
600.0	1.303	148.0	2.23	301.0	0.00172	0.0168	1.34	0.0507	1.00985	0.730
700.0	1.112	174.0	2.21	302.0	0.00146	0.0188	1.49	0.0668	1.00840	0.724
800.0	0.9715	201.0	2.18	302.0	0.00126	0.0208	1.64	0.0844	1.00733	0.720
900.0	0.8628	228.0	2.16	303.0	0.00112	0.0227	1.78	0.103	1.00651	0.718
1000.0	0.7763	256.0	2.12	303.0	0.00100	0.0246	1.91	0.124	1.00586	0.716
1500.0	0.5180	407.0	1.95	302.0	0.000664					
2000.0	0.3890	571.0	1.82	302.0	0.000497					
2500.0	0.3116	737.0	1.73	302.0	0.000398					
3000.0	0.2598	905.0	1.68	301.0	0.000332					
3500.0	0.2229	1070.0	1.64	301.0	0.000285					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

350 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01846	1960.0	248.0	-64.38	-63.18	0.5829	0.2412	0.4662	4208.0
120.0	0.01868	1700.0	223.0	-62.03	-60.82	0.6029	0.2495	0.4765	3882.0
125.0	0.01891	1480.0	203.0	-59.65	-58.42	0.6225	0.2513	0.4816	3630.0
130.0	0.01917	1300.0	186.0	-57.25	-56.01	0.6415	0.2498	0.4841	3422.0
135.0	0.01944	1150.0	171.0	-54.85	-53.59	0.6598	0.2468	0.4854	3244.0
140.0	0.01973	1030.0	157.0	-52.44	-51.16	0.6774	0.2432	0.4863	3086.0
145.0	0.02003	919.0	145.0	-50.02	-48.72	0.6945	0.2398	0.4877	2943.0
150.0	0.02036	823.0	134.0	-47.60	-46.28	0.7111	0.2366	0.4897	2809.0
155.0	0.02071	737.0	124.0	-45.17	-43.82	0.7272	0.2338	0.4928	2682.0
160.0	0.02103	659.0	115.0	-42.72	-41.35	0.7429	0.2315	0.4971	2560.0
165.0	0.02143	587.0	107.0	-40.24	-38.85	0.7583	0.2296	0.5029	2442.0
170.0	0.02193	521.0	98.6	-37.74	-36.32	0.7734	0.2280	0.5104	2325.0
175.0	0.02240	460.0	91.0	-35.19	-33.74	0.7883	0.2267	0.5199	2211.0
180.0	0.02293	402.0	83.9	-32.60	-31.11	0.8031	0.2257	0.5318	2096.0
185.0	0.02350	348.0	77.0	-29.94	-28.42	0.8179	0.2249	0.5467	1981.0
190.0	0.02415	297.0	70.3	-27.20	-25.64	0.8327	0.2243	0.5658	1864.0
200.0	0.02575	202.0	57.5	-21.38	-19.71	0.8631	0.2240	0.6263	1618.0
205.0	0.02681	156.0	51.1	-18.20	-16.46	0.8792	0.2245	0.6796	1481.0
210.0	0.02815	111.0	44.3	-14.68	-12.85	0.8965	0.2257	0.7731	1325.0
* 214.500	0.02394	67.7	37.4	-10.91	-8.981	0.9148	0.2283	0.9659	1152.0
* 214.500	0.1369	18.9	4.09	24.11	32.98	1.110	0.2337	0.8914	578.1
215.0	0.1387	19.8	4.01	24.39	33.38	1.112	0.2324	0.8543	581.3
220.0	0.1553	26.4	3.43	26.93	37.00	1.129	0.2221	0.6295	610.5
225.0	0.1686	35.2	3.06	28.94	39.87	1.142	0.2151	0.5307	634.0
230.0	0.1803	41.0	2.79	30.68	42.37	1.153	0.2098	0.4731	654.3
235.0	0.1909	46.2	2.58	32.26	44.63	1.162	0.2057	0.4348	672.4
240.0	0.2008	50.9	2.41	33.72	46.73	1.171	0.2023	0.4073	689.0
245.0	0.2101	55.3	2.27	35.10	48.72	1.180	0.1996	0.3865	704.4
250.0	0.2189	59.4	2.15	36.42	50.61	1.187	0.1972	0.3702	718.9
255.0	0.2275	63.3	2.05	37.66	52.42	1.194	0.1952	0.3571	732.5
260.0	0.2357	67.0	1.96	38.91	54.18	1.201	0.1935	0.3463	745.5
265.0	0.2437	70.6	1.88	40.10	55.89	1.208	0.1921	0.3372	757.9
270.0	0.2515	74.1	1.80	41.26	57.56	1.214	0.1908	0.3295	769.8
275.0	0.2591	77.4	1.74	42.39	59.19	1.220	0.1897	0.3229	781.3
280.0	0.2666	80.6	1.68	43.51	60.79	1.226	0.1887	0.3172	792.4
285.0	0.2739	83.8	1.62	44.61	62.36	1.231	0.1878	0.3122	803.1
290.0	0.2811	86.8	1.57	45.69	63.91	1.237	0.1870	0.3078	813.5
295.0	0.2882	89.8	1.52	46.76	65.44	1.242	0.1863	0.3038	823.7
300.0	0.2952	92.7	1.48	47.82	66.95	1.247	0.1857	0.3003	833.6
310.0	0.3090	98.5	1.40	49.90	69.92	1.257	0.1847	0.2943	852.7
320.0	0.3224	104.0	1.33	51.94	72.84	1.266	0.1838	0.2894	870.9
330.0	0.3357	109.0	1.27	53.96	75.71	1.275	0.1831	0.2853	888.5
340.0	0.3487	115.0	1.22	55.95	78.55	1.283	0.1825	0.2818	905.4
350.0	0.3615	120.0	1.17	57.92	81.35	1.291	0.1819	0.2788	921.8
360.0	0.3742	125.0	1.12	59.87	84.12	1.299	0.1815	0.2762	937.7
370.0	0.3868	130.0	1.08	61.80	86.87	1.307	0.1811	0.2740	953.1
380.0	0.3993	134.0	1.05	63.73	89.60	1.314	0.1808	0.2720	968.2
390.0	0.4116	139.0	1.01	65.64	92.32	1.321	0.1805	0.2703	982.8
400.0	0.4239	144.0	0.978	67.54	95.01	1.328	0.1803	0.2688	997.0
410.0	0.4360	149.0	0.948	69.43	97.69	1.334	0.1801	0.2674	1011.0
420.0	0.4481	153.0	0.920	71.31	100.4	1.341	0.1799	0.2662	1025.0
430.0	0.4602	158.0	0.894	73.19	103.0	1.347	0.1797	0.2651	1038.0
440.0	0.4721	162.0	0.869	75.06	105.7	1.353	0.1796	0.2641	1052.0
450.0	0.4840	167.0	0.846	76.93	108.3	1.359	0.1794	0.2631	1065.0
460.0	0.4959	171.0	0.824	78.79	110.9	1.365	0.1793	0.2623	1077.0
470.0	0.5077	176.0	0.803	80.64	113.5	1.371	0.1792	0.2616	1090.0
480.0	0.5194	180.0	0.783	82.49	116.2	1.376	0.1791	0.2609	1102.0
490.0	0.5311	184.0	0.765	84.34	118.8	1.381	0.1790	0.2602	1114.0
500.0	0.5428	189.0	0.747	86.18	121.4	1.387	0.1790	0.2596	1126.0
510.0	0.5545	193.0	0.730	88.02	124.0	1.392	0.1789	0.2591	1138.0
520.0	0.5661	197.0	0.714	89.85	126.5	1.397	0.1789	0.2586	1150.0
530.0	0.5777	202.0	0.699	91.69	129.1	1.402	0.1788	0.2581	1161.0
540.0	0.5892	206.0	0.684	93.52	131.7	1.407	0.1788	0.2577	1173.0
550.0	0.6007	210.0	0.670	95.34	134.3	1.411	0.1787	0.2573	1184.0
560.0	0.6122	214.0	0.657	97.17	136.9	1.416	0.1787	0.2570	1195.0
570.0	0.6237	218.0	0.644	98.99	139.4	1.420	0.1787	0.2566	1206.0
580.0	0.6352	223.0	0.632	100.8	142.0	1.425	0.1787	0.2563	1217.0
590.0	0.6466	227.0	0.620	102.6	144.5	1.429	0.1787	0.2560	1227.0
600.0	0.6580	231.0	0.608	104.5	147.1	1.434	0.1787	0.2558	1238.0
700.0	0.7713	272.0	0.515	122.6	172.6	1.473	0.1790	0.2542	1337.0
800.0	0.8835	312.0	0.447	140.7	198.0	1.507	0.1800	0.2540	1428.0
900.0	0.9949	352.0	0.395	158.9	223.4	1.537	0.1817	0.2549	1512.0
1000.0	1.105	391.0	0.354	177.3	249.0	1.564	0.1839	0.2566	1590.0
1500.0	1.657	585.0	0.234	273.2	380.6	1.670	0.1989	0.2705	1920.0
2000.0	2.206	778.0	0.175	376.3	519.3	1.750	0.2127	0.2839	2193.0
2500.0	2.754	970.0	0.140	485.4	663.8	1.814	0.2226	0.2936	2435.0
3000.0	3.301	1160.0	0.117	598.5	812.4	1.869	0.2294	0.3003	2655.0
3500.0	3.848	1350.0	0.100	714.4	963.8	1.915	0.2341	0.3050	2858.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

350 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DU)_V - V(DP/DV)_T$ PSIA-CU FT/BTU PSIA		$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.18	202.0	19.0	107000.0	0.00231	0.0943	20.7	0.00376	1.46699	3.66
120.0	53.54	195.0	16.7	91200.0	0.00245	0.0918	17.6	0.00360	1.46083	3.28
125.0	52.87	186.0	15.3	79400.0	0.00259	0.0888	15.2	0.00349	1.45441	2.97
130.0	52.17	177.0	14.3	68000.0	0.00273	0.0857	13.5	0.00339	1.44773	2.75
135.0	51.44	169.0	13.5	59400.0	0.00287	0.0827	12.3	0.00331	1.44080	2.60
140.0	50.69	161.0	12.8	52100.0	0.00302	0.0796	11.3	0.00323	1.43364	2.49
145.0	49.91	154.0	12.1	45900.0	0.00317	0.0766	10.2	0.00315	1.42625	2.34
150.0	49.11	147.0	11.6	40400.0	0.00333	0.0736	9.46	0.00306	1.41864	2.27
155.0	48.28	141.0	11.0	35600.0	0.00350	0.0706	8.75	0.00297	1.41080	2.20
160.0	47.42	135.0	10.5	31200.0	0.00369	0.0677	8.08	0.00287	1.40272	2.14
165.0	46.53	129.0	10.0	27300.0	0.00390	0.0649	7.46	0.00277	1.39436	2.08
170.0	45.60	123.0	9.49	23800.0	0.00415	0.0620	6.88	0.00266	1.38570	2.04
175.0	44.63	117.0	9.00	20500.0	0.00444	0.0592	6.33	0.00255	1.37669	2.00
180.0	43.62	111.0	8.52	17600.0	0.00479	0.0564	5.81	0.00243	1.36726	1.97
185.0	42.55	105.0	8.05	14800.0	0.00519	0.0536	5.32	0.00230	1.35735	1.96
190.0	41.40	99.0	7.57	12300.0	0.00571	0.0507	4.85	0.00217	1.34684	1.95
200.0	38.82	85.4	6.61	7840.0	0.00733	0.0450	3.96	0.00185	1.32326	1.98
205.0	37.30	77.6	6.10	5830.0	0.00875	0.0420	3.52	0.00166	1.30949	2.05
210.0	35.51	68.6	5.53	3930.0	0.0113	0.0390	3.07	0.00142	1.29331	2.19
* 214.500	33.40	58.3	4.91	2260.0	0.0166	0.0362	2.62	0.00112	1.27447	2.52
* 214.500	7.307	30.1	2.39	138.0	0.0296	0.0114	0.692	0.00175	1.05614	1.95
215.0	7.212	30.4	2.40	143.0	0.0281	0.0113	0.691	0.00183	1.05539	1.88
220.0	6.440	33.5	2.40	183.0	0.0188	0.0106	0.686	0.00261	1.04936	1.47
225.0	5.930	36.2	2.40	209.0	0.0147	0.0102	0.688	0.00325	1.04539	1.28
230.0	5.546	38.5	2.40	227.0	0.0123	0.0100	0.692	0.00383	1.04240	1.17
235.0	5.238	40.7	2.40	242.0	0.0107	0.00994	0.697	0.00436	1.04001	1.10
240.0	4.981	42.8	2.39	254.0	0.00952	0.00988	0.704	0.00487	1.03802	1.04
245.0	4.760	44.8	2.39	263.0	0.00863	0.00986	0.711	0.00536	1.03632	1.00
250.0	4.567	46.7	2.39	271.0	0.00793	0.00986	0.719	0.00583	1.03483	0.972
255.0	4.396	48.5	2.39	278.0	0.00736	0.00988	0.727	0.00629	1.03351	0.947
260.0	4.243	50.3	2.38	284.0	0.00684	0.00991	0.736	0.00675	1.03232	0.926
265.0	4.104	52.1	2.38	290.0	0.00647	0.0100	0.745	0.00720	1.03125	0.908
270.0	3.976	53.8	2.38	294.0	0.00612	0.0100	0.753	0.00764	1.03027	0.893
275.0	3.860	55.5	2.37	299.0	0.00582	0.0101	0.763	0.00809	1.02937	0.879
280.0	3.752	57.2	2.37	302.0	0.00555	0.0102	0.772	0.00853	1.02854	0.868
285.0	3.651	58.9	2.37	306.0	0.00530	0.0102	0.781	0.00898	1.02777	0.858
290.0	3.558	60.5	2.36	309.0	0.00508	0.0103	0.790	0.00942	1.02705	0.849
295.0	3.470	62.1	2.36	312.0	0.00489	0.0104	0.800	0.00987	1.02638	0.840
300.0	3.388	63.7	2.36	314.0	0.00472	0.0105	0.809	0.0103	1.02575	0.833
310.0	3.237	66.8	2.35	319.0	0.00440	0.0107	0.828	0.0112	1.02459	0.820
320.0	3.101	69.9	2.34	322.0	0.00414	0.0109	0.847	0.0122	1.02355	0.809
330.0	2.979	72.9	2.34	326.0	0.00391	0.0111	0.866	0.0131	1.02262	0.800
340.0	2.868	75.9	2.33	329.0	0.00371	0.0113	0.886	0.0140	1.02177	0.793
350.0	2.766	78.9	2.32	331.0	0.00353	0.0116	0.905	0.0150	1.02099	0.786
360.0	2.672	81.8	2.32	333.0	0.00338	0.0118	0.924	0.0159	1.02027	0.780
370.0	2.585	84.7	2.31	335.0	0.00323	0.0120	0.942	0.0169	1.01960	0.775
380.0	2.505	87.6	2.31	337.0	0.00310	0.0122	0.961	0.0179	1.01899	0.771
390.0	2.429	90.5	2.30	338.0	0.00299	0.0124	0.980	0.0189	1.01842	0.767
400.0	2.359	93.3	2.30	340.0	0.00288	0.0127	1.00	0.0200	1.01788	0.763
410.0	2.293	96.1	2.30	341.0	0.00279	0.0129	1.02	0.0210	1.01738	0.760
420.0	2.232	98.9	2.29	342.0	0.00269	0.0131	1.04	0.0221	1.01691	0.757
430.0	2.173	102.0	2.29	343.0	0.00261	0.0133	1.05	0.0231	1.01646	0.755
440.0	2.118	104.0	2.28	344.0	0.00253	0.0135	1.07	0.0242	1.01604	0.753
450.0	2.066	107.0	2.28	345.0	0.00245	0.0138	1.09	0.0253	1.01565	0.750
460.0	2.017	110.0	2.28	345.0	0.00239	0.0140	1.11	0.0264	1.01527	0.749
470.0	1.970	113.0	2.27	346.0	0.00232	0.0142	1.13	0.0275	1.01491	0.747
480.0	1.925	115.0	2.27	347.0	0.00226	0.0144	1.14	0.0287	1.01457	0.745
490.0	1.883	118.0	2.27	347.0	0.00220	0.0146	1.16	0.0298	1.01425	0.744
500.0	1.842	121.0	2.27	348.0	0.00215	0.0148	1.18	0.0310	1.01394	0.742
510.0	1.804	124.0	2.26	348.0	0.00210	0.0150	1.19	0.0322	1.01365	0.741
520.0	1.767	126.0	2.26	349.0	0.00205	0.0153	1.21	0.0334	1.01337	0.739
530.0	1.731	129.0	2.26	349.0	0.00201	0.0155	1.23	0.0346	1.01310	0.738
540.0	1.697	132.0	2.26	349.0	0.00196	0.0157	1.25	0.0358	1.01284	0.737
550.0	1.665	134.0	2.25	350.0	0.00192	0.0159	1.26	0.0371	1.01259	0.736
560.0	1.633	137.0	2.25	350.0	0.00188	0.0161	1.28	0.0383	1.01235	0.735
570.0	1.603	140.0	2.25	350.0	0.00184	0.0163	1.30	0.0396	1.01213	0.734
580.0	1.574	142.0	2.25	351.0	0.00180	0.0165	1.31	0.0409	1.01191	0.733
590.0	1.547	145.0	2.24	351.0	0.00177	0.0167	1.33	0.0422	1.01169	0.732
600.0	1.520	148.0	2.24	351.0	0.00173	0.0169	1.34	0.0435	1.01149	0.732
700.0	1.297	174.0	2.22	353.0	0.00145	0.0183	1.50	0.0574	1.00980	0.725
800.0	1.132	201.0	2.19	353.0	0.00126	0.0208	1.64	0.0725	1.00855	0.721
900.0	1.005	228.0	2.16	354.0	0.00112	0.0227	1.78	0.0888	1.00759	0.718
1000.0	0.9043	256.0	2.13	354.0	0.00100	0.0246	1.91	0.106	1.00683	0.716
1500.0	0.6035	406.0	1.95	353.0	0.000663					
2000.0	0.4534	571.0	1.82	353.0	0.000497					
2500.0	0.3632	738.0	1.73	352.0	0.000398					
3000.0	0.3029	906.0	1.68	352.0	0.000332					
3500.0	0.2598	1070.0	1.64	352.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

400 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01845	1990.0	247.0	-64.42	-63.06	0.5825	0.2425	0.4656	4204.0
120.0	0.01867	1710.0	223.0	-62.08	-60.70	0.6025	0.2507	0.4758	3881.0
125.0	0.01890	1490.0	203.0	-59.71	-58.31	0.6221	0.2524	0.4809	3630.0
130.0	0.01913	1310.0	186.0	-57.31	-55.89	0.6410	0.2508	0.4833	3424.0
135.0	0.01942	1160.0	171.0	-54.91	-53.48	0.6592	0.2477	0.4845	3247.0
140.0	0.01971	1040.0	158.0	-52.51	-51.05	0.6769	0.2441	0.4854	3091.0
145.0	0.02001	928.0	146.0	-50.10	-48.62	0.6939	0.2406	0.4866	2949.0
150.0	0.02034	832.0	135.0	-47.69	-46.18	0.7104	0.2373	0.4885	2816.0
155.0	0.02068	746.0	125.0	-45.27	-43.73	0.7265	0.2345	0.4914	2691.0
160.0	0.02105	668.0	116.0	-42.83	-41.27	0.7422	0.2321	0.4955	2570.0
165.0	0.02145	597.0	107.0	-40.37	-38.78	0.7575	0.2301	0.5010	2453.0
170.0	0.02189	531.0	99.2	-37.88	-36.26	0.7726	0.2285	0.5081	2338.0
175.0	0.02235	470.0	91.7	-35.35	-33.69	0.7874	0.2272	0.5170	2225.0
180.0	0.02286	412.0	84.6	-32.78	-31.08	0.8021	0.2261	0.5282	2113.0
185.0	0.02343	359.0	77.8	-30.14	-28.41	0.8168	0.2253	0.5421	2000.0
190.0	0.02405	308.0	71.2	-27.44	-25.66	0.8315	0.2246	0.5597	1886.0
200.0	0.02560	214.0	58.6	-21.71	-19.82	0.8614	0.2241	0.6138	1647.0
205.0	0.02653	169.0	52.3	-18.61	-16.64	0.8771	0.2244	0.6592	1516.0
210.0	0.02783	125.0	45.9	-15.24	-13.18	0.8938	0.2253	0.7334	1372.0
215.0	0.02955	79.9	38.9	-11.38	-9.196	0.9125	0.2274	0.8843	1200.0
* 219.400	0.03210	37.9	31.3	-7.002	-4.624	0.9336	0.2320	1.313	997.0
* 219.400	0.1104	12.6	5.33	22.14	30.31	1.093	0.2421	1.353	571.9
220.0	0.1134	14.3	5.13	22.71	31.11	1.096	0.2397	1.204	577.3
225.0	0.1313	24.5	4.20	25.97	35.70	1.117	0.2267	0.7442	610.4
230.0	0.1445	32.1	3.68	28.29	39.00	1.132	0.2185	0.5942	635.6
235.0	0.1557	38.4	3.32	30.22	41.75	1.143	0.2126	0.5156	657.0
240.0	0.1657	44.0	3.05	31.93	44.20	1.154	0.2080	0.4662	675.9
245.0	0.1748	49.0	2.84	33.49	46.44	1.163	0.2043	0.4319	693.0
250.0	0.1834	53.7	2.66	34.95	48.53	1.171	0.2013	0.4066	708.9
255.0	0.1915	58.1	2.51	36.33	50.52	1.179	0.1988	0.3871	723.7
260.0	0.1993	62.2	2.38	37.65	52.41	1.187	0.1966	0.3715	737.7
265.0	0.2068	66.1	2.27	38.92	54.24	1.194	0.1948	0.3589	750.9
270.0	0.2140	69.8	2.17	40.15	56.00	1.200	0.1932	0.3484	763.6
275.0	0.2211	73.4	2.09	41.35	57.72	1.207	0.1918	0.3395	775.7
280.0	0.2280	76.8	2.01	42.52	59.40	1.213	0.1906	0.3320	787.4
285.0	0.2347	80.2	1.94	43.66	61.04	1.218	0.1896	0.3254	798.7
290.0	0.2413	83.5	1.87	44.79	62.66	1.224	0.1886	0.3197	809.5
295.0	0.2477	86.6	1.81	45.89	64.24	1.229	0.1878	0.3147	820.1
300.0	0.2541	89.7	1.76	46.98	65.80	1.235	0.1871	0.3102	830.4
310.0	0.2665	95.7	1.66	49.12	68.87	1.245	0.1858	0.3027	850.1
320.0	0.2787	102.0	1.57	51.22	71.86	1.254	0.1848	0.2966	869.0
330.0	0.2906	107.0	1.50	53.28	74.80	1.263	0.1839	0.2916	887.0
340.0	0.3023	113.0	1.43	55.31	77.70	1.272	0.1832	0.2874	904.4
350.0	0.3138	118.0	1.37	57.31	80.55	1.280	0.1826	0.2838	921.2
360.0	0.3251	123.0	1.31	59.29	83.38	1.288	0.1821	0.2807	937.4
370.0	0.3363	128.0	1.26	61.26	86.17	1.296	0.1817	0.2781	953.1
380.0	0.3474	133.0	1.22	63.20	88.94	1.303	0.1813	0.2758	968.5
390.0	0.3584	138.0	1.17	65.14	91.69	1.310	0.1810	0.2737	983.4
400.0	0.3693	143.0	1.14	67.06	94.41	1.317	0.1807	0.2719	998.0
410.0	0.3801	148.0	1.10	68.97	97.12	1.324	0.1805	0.2703	1012.0
420.0	0.3908	152.0	1.07	70.87	99.8	1.330	0.1802	0.2689	1026.0
430.0	0.4015	157.0	1.03	72.77	102.5	1.337	0.1801	0.2676	1040.0
440.0	0.4121	162.0	1.01	74.65	105.2	1.343	0.1799	0.2664	1053.0
450.0	0.4226	166.0	0.978	76.53	107.8	1.349	0.1797	0.2653	1066.0
460.0	0.4331	171.0	0.952	78.40	110.5	1.355	0.1796	0.2644	1079.0
470.0	0.4435	175.0	0.927	80.27	113.1	1.360	0.1795	0.2635	1092.0
480.0	0.4539	180.0	0.904	82.13	115.7	1.366	0.1794	0.2627	1104.0
490.0	0.4642	184.0	0.882	83.99	118.4	1.371	0.1793	0.2619	1116.0
500.0	0.4745	189.0	0.861	85.84	121.0	1.377	0.1792	0.2613	1128.0
510.0	0.4848	193.0	0.842	87.69	123.6	1.382	0.1791	0.2606	1140.0
520.0	0.4951	197.0	0.823	89.53	126.2	1.387	0.1791	0.2601	1152.0
530.0	0.5053	202.0	0.805	91.37	128.8	1.392	0.1790	0.2595	1164.0
540.0	0.5154	206.0	0.788	93.21	131.4	1.397	0.1790	0.2590	1175.0
550.0	0.5256	210.0	0.771	95.05	134.0	1.401	0.1789	0.2586	1186.0
560.0	0.5357	214.0	0.756	96.88	136.6	1.406	0.1789	0.2582	1197.0
570.0	0.5458	219.0	0.741	98.71	139.1	1.411	0.1789	0.2578	1208.0
580.0	0.5559	223.0	0.726	100.5	141.7	1.415	0.1788	0.2574	1219.0
590.0	0.5660	227.0	0.713	102.4	144.3	1.419	0.1788	0.2571	1230.0
600.0	0.5760	231.0	0.699	104.2	146.9	1.424	0.1788	0.2568	1240.0
700.0	0.6756	273.0	0.591	122.4	172.4	1.463	0.1791	0.2549	1340.0
800.0	0.7741	313.0	0.512	140.6	197.9	1.497	0.1801	0.2545	1431.0
900.0	0.8718	353.0	0.453	158.8	223.4	1.527	0.1818	0.2553	1515.0
1000.0	0.9691	392.0	0.406	177.2	249.0	1.554	0.1840	0.2569	1593.0
1500.0	1.452	587.0	0.268	273.1	380.7	1.661	0.1990	0.2706	1923.0
2000.0	1.932	780.0	0.200	376.3	513.4	1.740	0.2127	0.2839	2196.0
2500.0	2.412	972.0	0.160	485.3	664.0	1.805	0.2226	0.2936	2437.0
3000.0	2.891	1160.0	0.133	598.5	812.6	1.859	0.2294	0.3004	2657.0
3500.0	3.370	1350.0	0.114	714.4	964.0	1.906	0.2341	0.3051	2860.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

400 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.20	203.0	18.8	108000.0	0.00230	0.0950	20.8	0.00376	1.46723	3.68
120.0	53.57	196.0	16.6	91700.0	0.00243	0.0920	17.7	0.00361	1.46111	3.29
125.0	52.30	187.0	15.2	79000.0	0.00257	0.0889	15.3	0.00350	1.45473	2.98
130.0	52.21	178.0	14.2	68600.0	0.00271	0.0859	13.6	0.00340	1.44809	2.76
135.0	51.49	170.0	13.4	59900.0	0.00285	0.0828	12.4	0.00332	1.44121	2.61
140.0	50.74	162.0	12.7	52600.0	0.00300	0.0798	11.4	0.00324	1.43410	2.49
145.0	49.97	155.0	12.1	46400.0	0.00314	0.0768	10.3	0.00316	1.42677	2.35
150.0	49.17	149.0	11.6	40900.0	0.00330	0.0738	9.51	0.00307	1.41922	2.27
155.0	48.35	142.0	11.0	36100.0	0.00346	0.0709	8.80	0.00298	1.41144	2.20
160.0	47.49	136.0	10.5	31700.0	0.00365	0.0680	8.14	0.00289	1.40342	2.14
165.0	46.61	130.0	10.0	27800.0	0.00385	0.0651	7.52	0.00279	1.39515	2.08
170.0	45.70	124.0	9.50	24300.0	0.00409	0.0623	6.94	0.00268	1.38658	2.04
175.0	44.74	118.0	9.02	21000.0	0.00436	0.0595	6.33	0.00257	1.37769	2.00
180.0	43.74	113.0	8.55	18000.0	0.00469	0.0567	5.87	0.00246	1.36840	1.97
185.0	42.69	107.0	8.09	15300.0	0.00508	0.0539	5.38	0.00233	1.35866	1.95
190.0	41.57	101.0	7.62	12800.0	0.00556	0.0512	4.92	0.00220	1.34836	1.94
200.0	39.06	87.5	6.69	8350.0	0.00702	0.0455	4.04	0.00190	1.32545	1.96
205.0	37.61	80.1	6.20	6350.0	0.00823	0.0426	3.61	0.00172	1.31227	2.01
210.0	35.93	71.7	5.67	4480.0	0.0102	0.0397	3.17	0.00151	1.29712	2.11
215.0	33.84	61.5	5.05	2700.0	0.0144	0.0367	2.71	0.00123	1.27841	2.35
* 219.400	31.16	49.6	4.33	1180.0	0.0265	0.0342	2.23	0.000837	1.25467	3.07
* 219.400	9.062	29.1	2.43	115.0	0.0465	0.0140	0.743	0.00114	1.06995	2.58
220.0	8.819	29.6	2.43	126.0	0.0407	0.0136	0.738	0.00128	1.06803	2.35
225.0	7.615	33.1	2.43	187.0	0.0225	0.0119	0.724	0.00211	1.05855	1.62
230.0	6.919	35.8	2.43	222.0	0.0166	0.0113	0.720	0.00274	1.05310	1.37
235.0	6.422	38.3	2.43	247.0	0.0135	0.0109	0.722	0.00329	1.04922	1.23
240.0	6.036	40.6	2.43	266.0	0.0115	0.0107	0.726	0.00379	1.04621	1.14
245.0	5.719	42.7	2.43	280.0	0.0101	0.0105	0.731	0.00426	1.04375	1.08
250.0	5.452	44.7	2.42	293.0	0.00909	0.0104	0.737	0.00471	1.04167	1.03
255.0	5.221	46.7	2.42	303.0	0.00823	0.0104	0.744	0.00514	1.03988	1.00
260.0	5.017	48.6	2.42	312.0	0.00765	0.0104	0.751	0.00556	1.03830	0.969
265.0	4.836	50.4	2.41	319.0	0.00711	0.0104	0.759	0.00598	1.03690	0.945
270.0	4.672	52.2	2.41	326.0	0.00667	0.0104	0.767	0.00639	1.03563	0.926
275.0	4.523	54.0	2.40	332.0	0.00629	0.0104	0.776	0.00679	1.03448	0.909
280.0	4.387	55.7	2.40	337.0	0.00596	0.0105	0.784	0.00720	1.03343	0.894
285.0	4.261	57.4	2.40	342.0	0.00566	0.0105	0.793	0.00760	1.03247	0.881
290.0	4.145	59.1	2.39	346.0	0.00541	0.0106	0.802	0.00801	1.03157	0.870
295.0	4.037	60.8	2.39	350.0	0.00518	0.0107	0.811	0.00841	1.03074	0.860
300.0	3.936	62.4	2.38	353.0	0.00497	0.0108	0.820	0.00882	1.02996	0.851
310.0	3.752	65.6	2.38	359.0	0.00461	0.0109	0.839	0.00963	1.02854	0.835
320.0	3.588	68.8	2.37	364.0	0.00431	0.0111	0.857	0.0105	1.02729	0.822
330.0	3.441	71.9	2.36	369.0	0.00406	0.0113	0.876	0.0113	1.02616	0.811
340.0	3.308	75.0	2.36	372.0	0.00383	0.0115	0.894	0.0121	1.02514	0.802
350.0	3.187	78.0	2.35	376.0	0.00364	0.0117	0.913	0.0130	1.02421	0.794
360.0	3.076	81.0	2.34	378.0	0.00347	0.0120	0.932	0.0138	1.02336	0.788
370.0	2.973	83.9	2.34	381.0	0.00331	0.0122	0.950	0.0147	1.02257	0.782
380.0	2.878	86.8	2.33	383.0	0.00318	0.0124	0.969	0.0156	1.02185	0.777
390.0	2.790	89.7	2.33	385.0	0.00305	0.0126	0.987	0.0165	1.02117	0.772
400.0	2.708	92.6	2.32	387.0	0.00294	0.0128	1.01	0.0174	1.02054	0.768
410.0	2.631	95.5	2.32	388.0	0.00283	0.0130	1.02	0.0183	1.01995	0.765
420.0	2.559	98.3	2.31	390.0	0.00273	0.0132	1.04	0.0193	1.01940	0.762
430.0	2.491	101.0	2.31	391.0	0.00265	0.0135	1.06	0.0202	1.01888	0.759
440.0	2.427	104.0	2.30	392.0	0.00256	0.0137	1.08	0.0212	1.01840	0.756
450.0	2.366	107.0	2.30	393.0	0.00249	0.0139	1.10	0.0221	1.01793	0.754
460.0	2.309	110.0	2.29	394.0	0.00241	0.0141	1.11	0.0231	1.01750	0.752
470.0	2.255	112.0	2.29	395.0	0.00235	0.0143	1.13	0.0241	1.01708	0.750
480.0	2.203	115.0	2.29	396.0	0.00228	0.0145	1.15	0.0251	1.01669	0.748
490.0	2.154	118.0	2.28	397.0	0.00222	0.0147	1.17	0.0261	1.01632	0.746
500.0	2.107	120.0	2.28	397.0	0.00217	0.0149	1.18	0.0272	1.01596	0.744
510.0	2.063	123.0	2.28	398.0	0.00212	0.0152	1.20	0.0282	1.01562	0.743
520.0	2.020	126.0	2.27	398.0	0.00207	0.0154	1.22	0.0293	1.01529	0.742
530.0	1.979	129.0	2.27	399.0	0.00202	0.0156	1.23	0.0303	1.01498	0.740
540.0	1.940	131.0	2.27	399.0	0.00197	0.0158	1.25	0.0314	1.01469	0.739
550.0	1.903	134.0	2.27	400.0	0.00193	0.0160	1.27	0.0325	1.01440	0.738
560.0	1.867	137.0	2.26	400.0	0.00189	0.0162	1.28	0.0336	1.01413	0.737
570.0	1.832	139.0	2.26	401.0	0.00185	0.0164	1.30	0.0347	1.01386	0.736
580.0	1.799	142.0	2.26	401.0	0.00181	0.0166	1.32	0.0359	1.01361	0.735
590.0	1.767	145.0	2.26	401.0	0.00178	0.0168	1.33	0.0370	1.01337	0.734
600.0	1.736	147.0	2.25	402.0	0.00174	0.0170	1.35	0.0381	1.01313	0.733
700.0	1.480	174.0	2.23	403.0	0.00146	0.0190	1.50	0.0503	1.01119	0.726
800.0	1.292	201.0	2.20	404.0	0.00127	0.0209	1.65	0.0636	1.00976	0.722
900.0	1.147	228.0	2.17	405.0	0.00112	0.0228	1.78	0.0779	1.00866	0.719
1000.0	1.032	256.0	2.14	405.0	0.00100	0.0247	1.91	0.0931	1.00779	0.717
1500.0	0.6888	408.0	1.95	404.0	0.000663					
2000.0	0.5176	572.0	1.82	404.0	0.000497					
2500.0	0.4147	739.0	1.74	403.0	0.000397					
3000.0	0.3459	906.0	1.68	402.0	0.000331					
3500.0	0.2968	1070.0	1.64	402.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

450 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
115.0	0.01844	2000.0	247.0	-64.47	-62.93	0.5821	0.2438	0.4650	4200.0
120.0	0.01866	1720.0	223.0	-62.13	-60.58	0.6021	0.2519	0.4751	3879.0
125.0	0.01889	1500.0	203.0	-59.76	-58.19	0.6216	0.2535	0.4801	3630.0
130.0	0.01914	1320.0	186.0	-57.37	-55.78	0.6405	0.2519	0.4825	3425.0
135.0	0.01941	1170.0	171.0	-54.98	-53.36	0.6587	0.2487	0.4836	3250.0
140.0	0.01969	1050.0	158.0	-52.59	-50.94	0.6763	0.2450	0.4844	3096.0
145.0	0.01993	937.0	146.0	-50.19	-48.52	0.6933	0.2414	0.4855	2955.0
150.0	0.02031	841.0	135.0	-47.78	-46.09	0.7098	0.2381	0.4873	2823.0
155.0	0.02066	755.0	125.0	-45.37	-43.65	0.7258	0.2352	0.4900	2699.0
160.0	0.02102	677.0	116.0	-42.94	-41.19	0.7415	0.2328	0.4939	2580.0
165.0	0.02142	606.0	108.0	-40.49	-38.70	0.7567	0.2307	0.4991	2464.0
170.0	0.02184	540.0	100.0	-38.01	-36.19	0.7717	0.2290	0.5058	2351.0
175.0	0.02230	479.0	92.3	-35.50	-33.64	0.7865	0.2276	0.5142	2240.0
180.0	0.02280	422.0	85.3	-32.95	-31.05	0.8011	0.2265	0.5247	2129.0
185.0	0.02335	369.0	78.5	-30.34	-28.39	0.8157	0.2256	0.5377	2018.0
190.0	0.02396	319.0	72.0	-27.66	-25.66	0.8302	0.2249	0.5540	1907.0
200.0	0.02545	225.0	59.6	-22.02	-19.90	0.8598	0.2243	0.6028	1674.0
205.0	0.02639	181.0	53.5	-19.00	-16.80	0.8751	0.2244	0.6420	1549.0
210.0	0.02754	138.0	47.3	-15.74	-13.45	0.8912	0.2250	0.7026	1413.0
215.0	0.02906	95.2	40.7	-12.11	-9.702	0.9089	0.2265	0.8124	1258.0
220.0	0.03142	51.1	33.1	-7.692	-5.074	0.9302	0.2301	1.095	1061.0
* 223.800	0.03548	14.0	24.7	-2.382	0.5732	0.9556	0.2390	2.516	827.0
* 223.800	0.08624	6.01	7.21	19.00	26.18	1.070	0.2524	2.917	567.1
225.0	0.09472	10.5	6.38	20.99	28.88	1.082	0.2453	1.698	579.9
230.0	0.1138	21.3	4.99	25.11	34.60	1.107	0.2300	0.8583	614.8
235.0	0.1268	30.0	4.31	27.74	38.30	1.123	0.2210	0.6534	640.7
240.0	0.1374	36.7	3.85	29.85	41.30	1.136	0.2146	0.5543	662.5
245.0	0.1468	42.6	3.52	31.68	43.91	1.147	0.2097	0.4944	681.7
250.0	0.1553	47.8	3.26	33.33	46.27	1.156	0.2058	0.4539	699.2
255.0	0.1633	52.7	3.05	34.86	48.47	1.165	0.2026	0.4245	715.3
260.0	0.1708	57.2	2.87	36.30	50.53	1.173	0.2000	0.4021	730.3
265.0	0.1779	61.5	2.72	37.67	52.50	1.180	0.1977	0.3845	744.4
270.0	0.1848	65.5	2.59	38.98	54.38	1.187	0.1958	0.3702	757.8
275.0	0.1914	69.4	2.47	40.25	56.20	1.194	0.1941	0.3584	770.6
280.0	0.1979	73.1	2.37	41.48	57.97	1.200	0.1927	0.3485	782.8
285.0	0.2041	76.7	2.28	42.68	59.69	1.207	0.1914	0.3401	794.6
290.0	0.2102	80.2	2.19	43.85	61.37	1.212	0.1903	0.3328	806.0
295.0	0.2162	83.5	2.12	45.00	63.02	1.218	0.1893	0.3265	817.0
300.0	0.2221	86.8	2.05	46.13	64.64	1.223	0.1884	0.3210	827.6
310.0	0.2336	93.1	1.93	48.34	67.80	1.234	0.1870	0.3117	848.0
320.0	0.2447	99.1	1.82	50.49	70.88	1.244	0.1858	0.3043	867.4
330.0	0.2556	105.0	1.73	52.59	73.89	1.253	0.1848	0.2982	885.9
340.0	0.2662	111.0	1.65	54.66	76.85	1.262	0.1840	0.2932	903.7
350.0	0.2767	116.0	1.57	56.70	79.76	1.270	0.1833	0.2890	920.8
360.0	0.2870	121.0	1.51	58.72	82.63	1.278	0.1827	0.2854	937.4
370.0	0.2971	127.0	1.45	60.71	85.47	1.286	0.1822	0.2823	953.4
380.0	0.3071	132.0	1.39	62.68	88.27	1.293	0.1818	0.2795	969.0
390.0	0.3171	137.0	1.34	64.64	91.06	1.301	0.1814	0.2772	984.1
400.0	0.3269	142.0	1.30	66.58	93.82	1.308	0.1811	0.2751	999.0
410.0	0.3366	147.0	1.26	68.51	96.56	1.314	0.1808	0.2732	1013.0
420.0	0.3463	151.0	1.22	70.43	99.28	1.321	0.1806	0.2716	1027.0
430.0	0.3559	156.0	1.18	72.34	102.0	1.327	0.1804	0.2701	1041.0
440.0	0.3654	161.0	1.14	74.24	104.7	1.334	0.1802	0.2687	1055.0
450.0	0.3748	166.0	1.11	76.13	107.4	1.340	0.1800	0.2675	1068.0
460.0	0.3843	170.0	1.08	78.02	110.0	1.345	0.1799	0.2664	1081.0
470.0	0.3936	175.0	1.05	79.90	112.7	1.351	0.1797	0.2654	1094.0
480.0	0.4029	179.0	1.03	81.77	115.3	1.357	0.1796	0.2645	1106.0
490.0	0.4122	184.0	1.00	83.64	118.0	1.362	0.1795	0.2637	1118.0
500.0	0.4215	188.0	0.978	85.50	120.6	1.368	0.1794	0.2629	1131.0
510.0	0.4307	193.0	0.955	87.36	123.2	1.373	0.1793	0.2622	1143.0
520.0	0.4398	197.0	0.933	89.21	125.9	1.378	0.1793	0.2615	1154.0
530.0	0.4490	202.0	0.912	91.06	128.5	1.383	0.1792	0.2609	1166.0
540.0	0.4581	206.0	0.893	92.91	131.1	1.388	0.1791	0.2604	1177.0
550.0	0.4672	210.0	0.874	94.75	133.7	1.392	0.1791	0.2599	1189.0
560.0	0.4762	215.0	0.856	96.59	136.3	1.397	0.1791	0.2594	1200.0
570.0	0.4853	219.0	0.839	98.43	138.9	1.402	0.1790	0.2589	1211.0
580.0	0.4943	223.0	0.822	100.3	141.5	1.406	0.1790	0.2585	1222.0
590.0	0.5033	227.0	0.806	102.1	144.0	1.411	0.1790	0.2582	1233.0
600.0	0.5123	232.0	0.791	103.9	146.6	1.415	0.1790	0.2578	1243.0
700.0	0.6012	273.0	0.667	122.2	172.3	1.455	0.1793	0.2556	1343.0
800.0	0.6830	314.0	0.578	140.4	197.8	1.489	0.1802	0.2550	1435.0
900.0	0.7761	354.0	0.510	158.7	223.3	1.519	0.1819	0.2557	1518.0
1000.0	0.8627	394.0	0.457	177.1	248.9	1.546	0.1841	0.2572	1596.0
1500.0	1.292	589.0	0.302	273.1	380.7	1.652	0.1930	0.2707	1926.0
2000.0	1.719	781.0	0.225	376.3	513.6	1.732	0.2127	0.2840	2198.0
2500.0	2.146	973.0	0.180	485.3	664.1	1.797	0.2226	0.2937	2433.0
3000.0	2.571	1170.0	0.150	598.4	812.7	1.851	0.2294	0.3004	2659.0
3500.0	2.997	1360.0	0.129	714.4	964.2	1.897	0.2341	0.3051	2862.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

450 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
115.0	54.23	204.0	18.7	108000.0	0.00228	0.0951	21.0	0.00377	1.46747	3.69
120.0	53.60	197.0	16.5	92300.0	0.00242	0.0921	17.8	0.00362	1.46139	3.31
125.0	52.94	188.0	15.1	79500.0	0.00255	0.0891	15.4	0.00351	1.45505	2.99
130.0	52.25	179.0	14.1	69100.0	0.00269	0.0861	13.7	0.00341	1.44846	2.76
135.0	51.53	171.0	13.3	60400.0	0.00283	0.0830	12.4	0.00333	1.44162	2.61
140.0	50.79	163.0	12.7	53100.0	0.00297	0.0800	11.4	0.00325	1.43456	2.49
145.0	50.02	156.0	12.1	46900.0	0.00312	0.0770	10.4	0.00317	1.42728	2.35
150.0	49.23	149.0	11.5	41400.0	0.00327	0.0741	9.57	0.00309	1.41978	2.27
155.0	48.41	143.0	11.0	36500.0	0.00343	0.0711	8.86	0.00300	1.41207	2.20
160.0	47.57	137.0	10.5	32200.0	0.00361	0.0683	8.20	0.00291	1.40412	2.13
165.0	46.70	131.0	10.0	28300.0	0.00381	0.0654	7.58	0.00281	1.39593	2.08
170.0	45.79	125.0	9.52	24700.0	0.00403	0.0626	6.99	0.00270	1.38746	2.03
175.0	44.85	120.0	9.04	21500.0	0.00430	0.0598	6.45	0.00259	1.37867	2.00
180.0	43.86	114.0	8.58	18500.0	0.00460	0.0571	5.93	0.00248	1.36951	1.96
185.0	42.83	108.0	8.13	15800.0	0.00497	0.0543	5.45	0.00236	1.35993	1.94
190.0	41.73	102.0	7.67	13300.0	0.00542	0.0516	4.98	0.00223	1.34983	1.93
200.0	39.29	89.5	6.76	8850.0	0.00674	0.0460	4.11	0.00194	1.32752	1.94
205.0	37.90	82.4	6.29	6860.0	0.00779	0.0432	3.69	0.00178	1.31485	1.97
210.0	36.31	74.5	5.79	5010.0	0.00943	0.0403	3.27	0.00158	1.30054	2.05
215.0	34.41	65.3	5.23	3270.0	0.0124	0.0375	2.83	0.00134	1.28351	2.21
220.0	31.83	53.7	4.53	1630.0	0.0204	0.0347	2.34	0.00100	1.26059	2.66
* 223.800	28.18	40.2	3.67	395.0	0.0626	0.0335	1.81	0.000473	1.22868	4.89
* 223.800	11.60	28.2	2.46	69.6	0.103	0.0193	0.815	0.000572	1.09012	4.42
225.0	10.56	29.4	2.47	111.0	0.0577	0.0165	0.792	0.000921	1.08183	2.93
230.0	8.786	33.0	2.47	192.0	0.0260	0.0134	0.762	0.00178	1.06777	1.76
235.0	7.889	35.9	2.47	236.0	0.0182	0.0123	0.753	0.00239	1.06071	1.44
240.0	7.278	38.4	2.47	267.0	0.0144	0.0118	0.752	0.00291	1.05591	1.28
245.0	6.813	40.7	2.46	290.0	0.0121	0.0114	0.754	0.00339	1.05227	1.18
250.0	6.436	42.9	2.46	308.0	0.0106	0.0112	0.757	0.00382	1.04934	1.11
255.0	6.124	45.0	2.46	323.0	0.00944	0.0110	0.763	0.00424	1.04690	1.06
260.0	5.855	46.9	2.45	335.0	0.00857	0.0109	0.769	0.00464	1.04480	1.02
265.0	5.620	48.9	2.45	346.0	0.00787	0.0109	0.775	0.00503	1.04298	0.988
270.0	5.411	50.7	2.44	355.0	0.00730	0.0108	0.782	0.00541	1.04136	0.963
275.0	5.224	52.6	2.44	363.0	0.00682	0.0108	0.790	0.00578	1.03990	0.941
280.0	5.054	54.4	2.43	370.0	0.00641	0.0108	0.798	0.00616	1.03859	0.923
285.0	4.899	56.1	2.43	376.0	0.00606	0.0109	0.806	0.00653	1.03739	0.907
290.0	4.756	57.8	2.42	381.0	0.00575	0.0109	0.814	0.00690	1.03629	0.893
295.0	4.625	59.5	2.42	386.0	0.00548	0.0110	0.823	0.00727	1.03527	0.881
300.0	4.502	61.2	2.41	391.0	0.00524	0.0110	0.832	0.00764	1.03432	0.870
310.0	4.281	64.5	2.41	399.0	0.00483	0.0112	0.849	0.00839	1.03262	0.851
320.0	4.087	67.7	2.40	405.0	0.00449	0.0114	0.867	0.00914	1.03112	0.836
330.0	3.913	70.9	2.39	411.0	0.00421	0.0116	0.885	0.00990	1.02978	0.823
340.0	3.756	74.0	2.38	415.0	0.00396	0.0117	0.903	0.0107	1.02858	0.812
350.0	3.614	77.1	2.37	420.0	0.00375	0.0119	0.922	0.0114	1.02749	0.803
360.0	3.485	80.1	2.37	423.0	0.00356	0.0121	0.940	0.0122	1.02649	0.795
370.0	3.366	83.1	2.36	426.0	0.00339	0.0123	0.958	0.0130	1.02558	0.788
380.0	3.256	86.1	2.35	429.0	0.00325	0.0126	0.976	0.0138	1.02474	0.783
390.0	3.154	89.1	2.35	432.0	0.00311	0.0128	0.995	0.0146	1.02396	0.778
400.0	3.059	92.0	2.34	434.0	0.00299	0.0130	1.01	0.0154	1.02323	0.773
410.0	2.971	94.9	2.34	436.0	0.00288	0.0132	1.03	0.0162	1.02255	0.769
420.0	2.888	97.7	2.33	438.0	0.00278	0.0134	1.05	0.0171	1.02192	0.766
430.0	2.810	101.0	2.33	439.0	0.00268	0.0136	1.07	0.0179	1.02132	0.762
440.0	2.737	103.0	2.32	441.0	0.00260	0.0138	1.08	0.0188	1.02076	0.759
450.0	2.668	106.0	2.32	442.0	0.00252	0.0140	1.10	0.0197	1.02024	0.757
460.0	2.602	109.0	2.31	443.0	0.00244	0.0142	1.12	0.0205	1.01974	0.754
470.0	2.540	112.0	2.31	444.0	0.00237	0.0144	1.14	0.0214	1.01926	0.752
480.0	2.482	115.0	2.30	445.0	0.00231	0.0147	1.15	0.0223	1.01881	0.750
490.0	2.426	117.0	2.30	446.0	0.00225	0.0149	1.17	0.0232	1.01839	0.748
500.0	2.373	120.0	2.30	447.0	0.00219	0.0151	1.19	0.0242	1.01798	0.747
510.0	2.322	123.0	2.29	448.0	0.00213	0.0153	1.21	0.0251	1.01760	0.745
520.0	2.274	126.0	2.29	448.0	0.00208	0.0155	1.22	0.0260	1.01723	0.743
530.0	2.227	128.0	2.29	449.0	0.00203	0.0157	1.24	0.0270	1.01687	0.742
540.0	2.183	131.0	2.28	449.0	0.00199	0.0159	1.26	0.0280	1.01654	0.741
550.0	2.140	134.0	2.28	450.0	0.00194	0.0161	1.27	0.0289	1.01621	0.739
560.0	2.100	137.0	2.28	450.0	0.00190	0.0163	1.29	0.0299	1.01590	0.738
570.0	2.061	139.0	2.27	451.0	0.00186	0.0165	1.30	0.0309	1.01560	0.737
580.0	2.023	142.0	2.27	451.0	0.00182	0.0167	1.32	0.0319	1.01532	0.736
590.0	1.987	145.0	2.27	452.0	0.00179	0.0169	1.34	0.0330	1.01504	0.735
600.0	1.952	147.0	2.26	452.0	0.00175	0.0171	1.35	0.0340	1.01478	0.734
700.0	1.663	174.0	2.24	454.0	0.00147	0.0191	1.51	0.0448	1.01258	0.727
800.0	1.451	201.0	2.21	456.0	0.00127	0.0210	1.65	0.0567	1.01097	0.722
900.0	1.289	229.0	2.18	456.0	0.00112	0.0229	1.79	0.0694	1.00974	0.719
1000.0	1.159	257.0	2.14	456.0	0.00100	0.0248	1.92	0.0830	1.00876	0.717
1500.0	0.7739	409.0	1.96	455.0	0.000662					
2000.0	0.5816	572.0	1.82	454.0	0.000496					
2500.0	0.4661	739.0	1.74	454.0	0.000397					
3000.0	0.3889	907.0	1.68	453.0	0.000331					
3500.0	0.3336	1070.0	1.65	453.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

493.000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	ISOTHERM DERIVATIVE CU FT-PSIA/LB	ISOCHORE DERIVATIVE PSIA/F	INTERNAL ENERGY BTU/LB	ENTHALPY BTU/LB	ENTROPY BTU/LB-R	CV BTU / LB -R	CP	VELOCITY OF SOUND FT/SEC
120.0	0.01865	1730.0	223.0	-62.17	-60.47	0.6017	0.2529	0.4745	3878.0
125.0	0.01888	1510.0	203.0	-59.81	-58.08	0.6212	0.2545	0.4795	3630.0
130.0	0.01913	1330.0	186.0	-57.43	-55.68	0.6401	0.2527	0.4818	3427.0
135.0	0.01939	1180.0	171.0	-55.04	-53.27	0.6583	0.2495	0.4828	3253.0
140.0	0.01967	1050.0	158.0	-52.65	-50.85	0.6759	0.2458	0.4836	3099.0
145.0	0.01997	944.0	146.0	-50.26	-48.43	0.6928	0.2421	0.4846	2960.0
150.0	0.02029	848.0	136.0	-47.86	-46.01	0.7093	0.2387	0.4863	2830.0
155.0	0.02063	763.0	126.0	-45.45	-43.57	0.7253	0.2358	0.4888	2707.0
160.0	0.02099	685.0	117.0	-43.03	-41.12	0.7409	0.2333	0.4925	2588.0
165.0	0.02138	614.0	108.0	-40.59	-38.64	0.7561	0.2312	0.4975	2474.0
170.0	0.02180	548.0	100.0	-38.13	-36.14	0.7710	0.2295	0.5039	2362.0
175.0	0.02225	488.0	92.9	-35.63	-33.60	0.7858	0.2280	0.5119	2252.0
180.0	0.02275	431.0	85.8	-33.09	-31.02	0.8003	0.2269	0.5219	2143.0
185.0	0.02329	378.0	79.1	-30.50	-28.38	0.8148	0.2259	0.5342	2034.0
190.0	0.02388	327.0	72.7	-27.85	-25.67	0.8292	0.2252	0.5495	1924.0
200.0	0.02533	235.0	60.4	-22.28	-19.97	0.8584	0.2244	0.5942	1697.0
205.0	0.02623	191.0	54.5	-19.31	-16.92	0.8735	0.2244	0.6292	1576.0
210.0	0.02731	149.0	48.4	-16.14	-13.65	0.8892	0.2248	0.6811	1447.0
215.0	0.02871	107.0	42.2	-12.67	-10.05	0.9062	0.2259	0.7685	1301.0
220.0	0.03071	65.6	35.2	-8.623	-5.820	0.9257	0.2285	0.9550	1127.0
225.0	0.03471	22.0	26.1	-2.834	0.3338	0.9533	0.2361	1.792	879.4
* 227.200	0.04345	0.01E0	14.1	7.822	12.34	1.006	0.2608	1277.0	601.8
* 227.200	0.04342	0.01E7	14.1	7.810	12.32	1.006	0.2608	1219.0	601.9
230.0	0.08742	11.3	6.99	20.80	28.78	1.078	0.2442	1.647	595.1
235.0	0.1047	22.0	5.50	25.00	34.56	1.103	0.2300	0.8838	626.4
240.0	0.1167	30.1	4.74	27.73	38.38	1.119	0.2213	0.6736	651.2
245.0	0.1266	36.8	4.24	29.90	41.46	1.132	0.2150	0.5702	672.4
250.0	0.1353	42.7	3.87	31.79	44.15	1.143	0.2101	0.5074	691.3
255.0	0.1433	48.1	3.58	33.49	46.57	1.153	0.2062	0.4648	708.5
260.0	0.1507	53.0	3.34	35.06	48.81	1.161	0.2030	0.4339	724.4
265.0	0.1577	57.6	3.15	36.53	50.92	1.169	0.2004	0.4103	739.3
270.0	0.1643	61.9	2.98	37.92	52.93	1.177	0.1981	0.3918	753.3
275.0	0.1707	66.0	2.84	39.26	54.85	1.184	0.1962	0.3768	766.6
280.0	0.1768	70.0	2.71	40.55	56.70	1.191	0.1945	0.3644	779.3
285.0	0.1828	73.7	2.59	41.80	58.49	1.197	0.1930	0.3540	791.5
290.0	0.1886	77.4	2.49	43.02	60.24	1.203	0.1918	0.3451	803.3
295.0	0.1943	80.9	2.40	44.21	61.95	1.209	0.1907	0.3375	814.6
300.0	0.1998	84.3	2.32	45.38	63.62	1.214	0.1897	0.3309	825.6
310.0	0.2106	90.9	2.17	47.64	66.87	1.225	0.1880	0.3199	846.5
320.0	0.2210	97.1	2.04	49.85	70.02	1.235	0.1866	0.3112	866.3
330.0	0.2312	103.0	1.94	51.99	73.10	1.245	0.1855	0.3042	885.3
340.0	0.2411	109.0	1.84	54.10	76.11	1.254	0.1846	0.2984	903.4
350.0	0.2508	115.0	1.76	56.17	79.07	1.262	0.1839	0.2936	920.8
360.0	0.2604	120.0	1.68	58.21	81.98	1.270	0.1832	0.2894	937.6
370.0	0.2698	125.0	1.61	60.23	84.86	1.278	0.1827	0.2859	953.8
380.0	0.2791	131.0	1.55	62.23	87.70	1.286	0.1822	0.2829	969.6
390.0	0.2882	136.0	1.49	64.20	90.52	1.293	0.1818	0.2802	984.9
400.0	0.2973	141.0	1.44	66.17	93.31	1.300	0.1815	0.2778	1000.0
410.0	0.3063	146.0	1.39	68.11	96.08	1.307	0.1812	0.2758	1014.0
420.0	0.3152	151.0	1.35	70.05	98.82	1.314	0.1809	0.2739	1029.0
430.0	0.3241	156.0	1.31	71.97	101.6	1.320	0.1807	0.2723	1043.0
440.0	0.3328	160.0	1.27	73.88	104.3	1.326	0.1805	0.2708	1056.0
450.0	0.3416	165.0	1.23	75.79	107.0	1.332	0.1803	0.2694	1069.0
460.0	0.3502	170.0	1.20	77.69	109.7	1.338	0.1801	0.2682	1083.0
470.0	0.3588	174.0	1.16	79.58	112.3	1.344	0.1800	0.2671	1095.0
480.0	0.3674	179.0	1.13	81.46	115.0	1.350	0.1798	0.2661	1108.0
490.0	0.3760	184.0	1.11	83.34	117.7	1.355	0.1797	0.2652	1120.0
500.0	0.3844	188.0	1.08	85.21	120.3	1.361	0.1796	0.2643	1133.0
510.0	0.3929	193.0	1.05	87.07	122.9	1.366	0.1795	0.2635	1145.0
520.0	0.4013	197.0	1.03	88.94	125.6	1.371	0.1794	0.2628	1156.0
530.0	0.4097	202.0	1.01	90.79	128.2	1.376	0.1794	0.2621	1168.0
540.0	0.4181	206.0	0.984	92.65	130.8	1.381	0.1793	0.2615	1180.0
550.0	0.4264	210.0	0.963	94.50	133.4	1.386	0.1793	0.2610	1191.0
560.0	0.4348	215.0	0.943	96.35	136.0	1.390	0.1792	0.2604	1202.0
570.0	0.4431	219.0	0.924	98.19	138.6	1.395	0.1792	0.2599	1213.0
580.0	0.4513	223.0	0.906	100.0	141.2	1.399	0.1791	0.2595	1224.0
590.0	0.4596	228.0	0.888	101.9	143.8	1.404	0.1791	0.2591	1235.0
600.0	0.4678	232.0	0.871	103.7	146.4	1.408	0.1791	0.2587	1246.0
700.0	0.5493	274.0	0.733	122.0	172.1	1.448	0.1794	0.2562	1346.0
800.0	0.6296	315.0	0.635	140.2	197.7	1.482	0.1803	0.2555	1437.0
900.0	0.7093	355.0	0.560	158.5	223.3	1.512	0.1819	0.2560	1521.0
1000.0	0.7885	395.0	0.501	177.0	249.0	1.539	0.1841	0.2575	1599.0
1500.0	1.181	590.0	0.331	273.0	380.8	1.646	0.1990	0.2708	1928.0
2000.0	1.571	783.0	0.247	376.2	519.7	1.726	0.2128	0.2840	2200.0
2500.0	1.960	975.0	0.197	485.3	664.2	1.790	0.2226	0.2937	2441.0
3000.0	2.349	1170.0	0.164	598.4	812.9	1.844	0.2294	0.3004	2661.0
3500.0	2.737	1360.0	0.141	714.4	964.3	1.891	0.2341	0.3051	2864.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

493.000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.62	198.0	16.4	92800.0	0.00240	0.0922	17.9	0.00363	1.46163	3.32
125.0	52.96	189.0	15.1	80000.0	0.00254	0.0892	15.5	0.00351	1.45532	3.00
130.0	52.28	180.0	14.1	69500.0	0.00267	0.0862	13.8	0.00342	1.44877	2.77
135.0	51.57	172.0	13.3	60900.0	0.00281	0.0832	12.5	0.00334	1.44197	2.61
140.0	50.83	164.0	12.7	53600.0	0.00295	0.0802	11.5	0.00326	1.43495	2.50
145.0	50.07	157.0	12.1	47300.0	0.00309	0.0772	10.4	0.00318	1.42771	2.36
150.0	49.28	150.0	11.5	41800.0	0.00324	0.0743	9.62	0.00310	1.42026	2.27
155.0	48.47	144.0	11.0	37000.0	0.00340	0.0713	8.91	0.00301	1.41260	2.20
160.0	47.63	138.0	10.5	32600.0	0.00357	0.0685	8.24	0.00292	1.40472	2.13
165.0	46.77	132.0	10.0	28700.0	0.00377	0.0656	7.62	0.00282	1.39659	2.08
170.0	45.87	126.0	9.53	25200.0	0.00399	0.0629	7.04	0.00272	1.38819	2.03
175.0	44.94	121.0	9.06	21900.0	0.00424	0.0601	6.50	0.00261	1.37949	1.99
180.0	43.96	115.0	8.61	18900.0	0.00453	0.0574	5.99	0.00250	1.37045	1.96
185.0	42.94	109.0	8.16	16200.0	0.00488	0.0546	5.50	0.00238	1.36099	1.94
190.0	41.86	104.0	7.71	13700.0	0.00531	0.0519	5.04	0.00226	1.35105	1.92
200.0	39.48	91.1	6.82	9270.0	0.00652	0.0464	4.17	0.00198	1.32923	1.92
205.0	38.13	84.3	6.37	7290.0	0.00747	0.0437	3.76	0.00182	1.31694	1.95
210.0	36.61	76.8	5.88	5460.0	0.00887	0.0409	3.35	0.00164	1.30324	2.01
215.0	34.84	68.2	5.36	3740.0	0.0113	0.0381	2.93	0.00142	1.28730	2.13
220.0	32.57	57.9	4.74	2140.0	0.0165	0.0354	2.47	0.00114	1.26713	2.40
225.0	28.81	43.5	3.84	634.0	0.0412	0.0331	1.89	0.000642	1.23414	3.68
* 227.200	20.22	29.3	2.67	0.323	43.6	0.199	1.14	0.00000769	1.16080	263.0
* 227.200	20.23	29.3	2.67	0.339	41.6	0.195	1.14	0.00000789	1.16088	257.0
230.0	11.44	30.5	2.50	130.0	0.0539	0.0176	0.826	0.000934	1.08887	2.78
235.0	9.552	33.9	2.50	211.0	0.0261	0.0143	0.731	0.00170	1.07383	1.76
240.0	8.569	36.6	2.50	258.0	0.0184	0.0131	0.780	0.00227	1.06606	1.45
245.0	7.898	39.1	2.50	291.0	0.0146	0.0124	0.777	0.00275	1.06077	1.29
250.0	7.388	41.4	2.49	316.0	0.0123	0.0120	0.778	0.00319	1.05677	1.19
255.0	6.978	43.5	2.49	335.0	0.0107	0.0117	0.781	0.00360	1.05356	1.12
260.0	6.636	45.6	2.48	352.0	0.00951	0.0115	0.785	0.00399	1.05089	1.07
265.0	6.342	47.6	2.48	365.0	0.00862	0.0113	0.790	0.00436	1.04860	1.03
270.0	6.086	49.5	2.47	377.0	0.00791	0.0113	0.796	0.00472	1.04660	1.00
275.0	5.859	51.4	2.47	387.0	0.00733	0.0112	0.803	0.00508	1.04483	0.972
280.0	5.655	53.2	2.46	396.0	0.00684	0.0112	0.810	0.00543	1.04325	0.950
285.0	5.470	55.0	2.46	403.0	0.00643	0.0112	0.818	0.00578	1.04182	0.931
290.0	5.302	56.8	2.45	410.0	0.00607	0.0112	0.826	0.00613	1.04051	0.914
295.0	5.148	58.6	2.45	416.0	0.00576	0.0113	0.834	0.00648	1.03931	0.900
300.0	5.005	60.3	2.44	422.0	0.00549	0.0113	0.842	0.00683	1.03821	0.887
310.0	4.749	63.6	2.43	432.0	0.00503	0.0114	0.859	0.00752	1.03623	0.865
320.0	4.525	66.9	2.42	440.0	0.00465	0.0116	0.876	0.00822	1.03450	0.847
330.0	4.326	70.1	2.41	446.0	0.00434	0.0117	0.894	0.00893	1.03296	0.833
340.0	4.148	73.3	2.40	452.0	0.00407	0.0119	0.911	0.00964	1.03159	0.821
350.0	3.987	76.4	2.40	457.0	0.00384	0.0121	0.929	0.0104	1.03035	0.810
360.0	3.841	79.5	2.39	461.0	0.00364	0.0123	0.947	0.0111	1.02923	0.802
370.0	3.707	82.5	2.38	465.0	0.00347	0.0125	0.965	0.0118	1.02820	0.794
380.0	3.583	85.5	2.37	468.0	0.00331	0.0127	0.983	0.0125	1.02725	0.788
390.0	3.469	88.5	2.37	471.0	0.00317	0.0129	1.00	0.0133	1.02637	0.782
400.0	3.363	91.4	2.36	474.0	0.00304	0.0131	1.02	0.0140	1.02556	0.777
410.0	3.265	94.4	2.35	476.0	0.00292	0.0133	1.04	0.0148	1.02480	0.773
420.0	3.172	97.3	2.35	478.0	0.00282	0.0135	1.05	0.0156	1.02410	0.769
430.0	3.086	100.0	2.34	480.0	0.00272	0.0137	1.07	0.0163	1.02343	0.765
440.0	3.004	103.0	2.34	482.0	0.00263	0.0139	1.09	0.0171	1.02281	0.762
450.0	2.928	106.0	2.33	484.0	0.00255	0.0141	1.11	0.0179	1.02222	0.759
460.0	2.855	109.0	2.33	485.0	0.00247	0.0143	1.12	0.0187	1.02167	0.757
470.0	2.787	112.0	2.32	486.0	0.00240	0.0146	1.14	0.0196	1.02114	0.754
480.0	2.722	114.0	2.32	487.0	0.00233	0.0148	1.16	0.0204	1.02065	0.752
490.0	2.660	117.0	2.31	488.0	0.00226	0.0150	1.18	0.0212	1.02018	0.750
500.0	2.601	120.0	2.31	489.0	0.00220	0.0152	1.19	0.0221	1.01973	0.748
510.0	2.545	123.0	2.31	490.0	0.00215	0.0154	1.21	0.0229	1.01930	0.747
520.0	2.492	125.0	2.30	491.0	0.00210	0.0156	1.23	0.0238	1.01889	0.745
530.0	2.441	128.0	2.30	492.0	0.00205	0.0158	1.24	0.0247	1.01850	0.744
540.0	2.392	131.0	2.29	493.0	0.00200	0.0160	1.26	0.0256	1.01813	0.742
550.0	2.345	134.0	2.29	493.0	0.00195	0.0162	1.28	0.0264	1.01777	0.741
560.0	2.300	136.0	2.29	494.0	0.00191	0.0164	1.29	0.0274	1.01743	0.740
570.0	2.257	139.0	2.28	494.0	0.00187	0.0166	1.31	0.0283	1.01710	0.738
580.0	2.216	142.0	2.28	495.0	0.00183	0.0168	1.32	0.0292	1.01679	0.737
590.0	2.176	144.0	2.28	495.0	0.00179	0.0170	1.34	0.0301	1.01648	0.736
600.0	2.138	147.0	2.28	496.0	0.00176	0.0172	1.36	0.0311	1.01619	0.735
700.0	1.821	174.0	2.25	498.0	0.00147	0.0191	1.51	0.0410	1.01378	0.728
800.0	1.588	201.0	2.22	500.0	0.00127	0.0210	1.65	0.0519	1.01201	0.723
900.0	1.410	229.0	2.18	500.0	0.00112	0.0229	1.79	0.0635	1.01066	0.719
1000.0	1.268	257.0	2.15	500.0	0.00100	0.0248	1.92	0.0759	1.00958	0.717
1500.0	0.8468	409.0	1.96	500.0	0.000662					
2000.0	0.6366	573.0	1.82	498.0	0.000496					
2500.0	0.5102	740.0	1.74	497.0	0.000397					
3000.0	0.4258	908.0	1.68	497.0	0.000331					
3500.0	0.3653	1070.0	1.65	496.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

500 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01865	1730.0	223.0	-62.18	-60.43	0.6017	0.2531	0.4744	3878.0
125.0	0.01888	1510.0	203.0	-59.82	-58.07	0.6212	0.2546	0.4794	3630.0
130.0	0.01913	1330.0	186.0	-57.44	-55.66	0.6400	0.2529	0.4817	3427.0
135.0	0.01939	1180.0	171.0	-55.05	-53.25	0.6582	0.2496	0.4827	3254.0
140.0	0.01967	1050.0	158.0	-52.66	-50.84	0.6758	0.2459	0.4835	3100.0
145.0	0.01997	946.0	146.0	-50.27	-48.42	0.6928	0.2422	0.4845	2960.0
150.0	0.02029	850.0	136.0	-47.87	-45.99	0.7092	0.2388	0.4861	2831.0
155.0	0.02063	764.0	126.0	-45.47	-43.56	0.7252	0.2359	0.4887	2708.0
160.0	0.02093	686.0	117.0	-43.05	-41.10	0.7408	0.2334	0.4923	2590.0
165.0	0.02138	615.0	108.0	-40.61	-38.63	0.7560	0.2313	0.4972	2476.0
170.0	0.02180	550.0	100.0	-38.15	-36.13	0.7709	0.2295	0.5036	2364.0
175.0	0.02225	489.0	93.0	-35.65	-33.59	0.7856	0.2281	0.5116	2254.0
180.0	0.02274	432.0	85.9	-33.12	-31.01	0.8002	0.2269	0.5215	2145.0
185.0	0.02328	379.0	79.3	-30.53	-28.37	0.8145	0.2260	0.5336	2036.0
190.0	0.02388	329.0	72.8	-27.88	-25.67	0.8290	0.2253	0.5488	1927.0
200.0	0.02531	236.0	60.6	-22.32	-19.38	0.8582	0.2244	0.5929	1701.0
205.0	0.02620	193.0	54.6	-19.36	-16.33	0.8733	0.2244	0.6273	1581.0
210.0	0.02728	151.0	48.6	-16.21	-13.68	0.8889	0.2248	0.6780	1452.0
215.0	0.02865	109.0	42.4	-12.75	-10.10	0.9058	0.2258	0.7624	1308.0
220.0	0.03061	67.9	35.5	-8.756	-5.922	0.9250	0.2283	0.9384	1137.0
225.0	0.03435	25.0	26.8	-3.193	-0.01321	0.9516	0.2352	1.645	899.3
230.0	0.08253	9.39	7.51	19.74	27.38	1.072	0.2472	1.993	592.0
235.0	0.1012	20.7	5.74	24.47	33.84	1.100	0.2317	0.9416	624.2
240.0	0.1136	29.0	4.91	27.34	37.85	1.117	0.2225	0.6992	649.4
245.0	0.1236	35.8	4.37	29.59	41.04	1.130	0.2159	0.5852	670.9
250.0	0.1324	41.9	3.98	31.52	43.78	1.141	0.2108	0.5175	690.0
255.0	0.1404	47.3	3.67	33.25	46.25	1.151	0.2068	0.4722	707.4
260.0	0.1477	52.3	3.43	34.85	48.52	1.159	0.2035	0.4396	723.5
265.0	0.1547	57.0	3.22	36.34	50.66	1.168	0.2008	0.4149	738.5
270.0	0.1613	61.3	3.05	37.75	52.68	1.175	0.1985	0.3956	752.6
275.0	0.1676	65.5	2.90	39.10	54.62	1.182	0.1965	0.3800	766.0
280.0	0.1736	69.5	2.77	40.40	56.49	1.189	0.1948	0.3671	778.8
285.0	0.1797	73.3	2.65	41.66	58.29	1.195	0.1933	0.3564	791.1
290.0	0.1854	76.9	2.54	42.88	60.05	1.202	0.1920	0.3472	802.9
295.0	0.1910	80.5	2.45	44.08	61.77	1.207	0.1909	0.3394	814.3
300.0	0.1965	83.9	2.36	45.25	63.45	1.213	0.1899	0.3325	825.3
310.0	0.2072	90.5	2.21	47.53	66.72	1.224	0.1882	0.3213	846.3
320.0	0.2175	96.8	2.08	49.74	63.88	1.234	0.1868	0.3124	866.2
330.0	0.2276	103.0	1.97	51.90	72.97	1.243	0.1857	0.3052	885.2
340.0	0.2374	109.0	1.87	54.01	75.99	1.252	0.1847	0.2993	903.3
350.0	0.2470	114.0	1.79	56.09	78.96	1.261	0.1840	0.2943	920.8
360.0	0.2565	120.0	1.71	58.13	81.88	1.269	0.1833	0.2901	937.6
370.0	0.2658	125.0	1.64	60.15	84.76	1.277	0.1828	0.2865	953.9
380.0	0.2749	131.0	1.58	62.15	87.61	1.285	0.1823	0.2834	969.7
390.0	0.2840	136.0	1.52	64.13	90.43	1.292	0.1819	0.2807	985.1
400.0	0.2930	141.0	1.46	66.10	93.23	1.299	0.1815	0.2783	1000.0
410.0	0.3019	146.0	1.41	68.05	96.00	1.306	0.1812	0.2762	1015.0
420.0	0.3107	151.0	1.37	69.98	98.75	1.313	0.1810	0.2743	1029.0
430.0	0.3194	156.0	1.33	71.91	101.5	1.319	0.1807	0.2726	1043.0
440.0	0.3281	160.0	1.29	73.83	104.2	1.325	0.1805	0.2711	1056.0
450.0	0.3367	165.0	1.25	75.73	106.8	1.331	0.1803	0.2697	1070.0
460.0	0.3452	170.0	1.22	77.63	109.6	1.337	0.1801	0.2685	1083.0
470.0	0.3538	174.0	1.18	79.52	112.3	1.343	0.1800	0.2674	1096.0
480.0	0.3622	179.0	1.15	81.41	114.9	1.349	0.1799	0.2663	1108.0
490.0	0.3706	184.0	1.12	83.29	117.6	1.354	0.1797	0.2654	1121.0
500.0	0.3790	188.0	1.10	85.16	120.3	1.359	0.1796	0.2645	1133.0
510.0	0.3874	193.0	1.07	87.03	122.9	1.365	0.1795	0.2637	1145.0
520.0	0.3957	197.0	1.05	88.89	125.5	1.370	0.1795	0.2630	1157.0
530.0	0.4040	202.0	1.02	90.75	128.2	1.375	0.1794	0.2623	1169.0
540.0	0.4122	206.0	1.00	92.61	130.8	1.380	0.1793	0.2617	1180.0
550.0	0.4205	210.0	0.978	94.46	133.4	1.384	0.1793	0.2611	1191.0
560.0	0.4287	215.0	0.957	96.31	136.0	1.389	0.1792	0.2606	1203.0
570.0	0.4369	219.0	0.938	98.15	138.6	1.394	0.1792	0.2601	1214.0
580.0	0.4450	223.0	0.919	100.0	141.2	1.398	0.1792	0.2596	1225.0
590.0	0.4532	228.0	0.901	101.8	143.8	1.403	0.1791	0.2592	1235.0
600.0	0.4613	232.0	0.884	103.7	146.4	1.407	0.1791	0.2588	1246.0
700.0	0.5417	274.0	0.744	122.0	172.1	1.447	0.1794	0.2563	1347.0
800.0	0.6209	315.0	0.644	140.2	197.7	1.481	0.1803	0.2556	1438.0
900.0	0.6995	355.0	0.568	158.5	223.3	1.511	0.1819	0.2561	1522.0
1000.0	0.7776	395.0	0.509	177.0	248.9	1.538	0.1841	0.2575	1599.0
1500.0	1.165	590.0	0.335	273.0	380.3	1.645	0.1990	0.2708	1929.0
2000.0	1.549	783.0	0.251	376.2	519.7	1.725	0.2128	0.2840	2201.0
2500.0	1.933	975.0	0.200	485.3	664.3	1.789	0.2226	0.2937	2442.0
3000.0	2.316	1170.0	0.167	598.4	812.9	1.843	0.2294	0.3004	2661.0
3500.0	2.699	1360.0	0.143	714.4	964.3	1.890	0.2341	0.3051	2864.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

500 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DU)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.63	198.0	16.4	92800.0	0.00240	0.0923	17.9	0.00363	1.46167	3.32
125.0	52.97	189.0	15.0	80000.0	0.00253	0.0893	15.5	0.00352	1.45537	3.00
130.0	52.28	180.0	14.1	69600.0	0.00267	0.0862	13.8	0.00342	1.44882	2.77
135.0	51.57	172.0	13.3	60900.0	0.00281	0.0832	12.5	0.00334	1.44202	2.61
140.0	50.84	164.0	12.6	53600.0	0.00295	0.0802	11.5	0.00326	1.43501	2.50
145.0	50.07	157.0	12.1	47400.0	0.00309	0.0772	10.5	0.00318	1.42778	2.36
150.0	49.29	150.0	11.5	41900.0	0.00324	0.0743	9.62	0.00310	1.42034	2.27
155.0	48.48	144.0	11.0	37000.0	0.00340	0.0714	8.91	0.00301	1.41269	2.20
160.0	47.64	138.0	10.5	32700.0	0.00357	0.0685	8.25	0.00292	1.40481	2.13
165.0	46.78	132.0	10.0	28800.0	0.00375	0.0657	7.63	0.00282	1.39670	2.08
170.0	45.88	127.0	9.53	25200.0	0.00393	0.0629	7.05	0.00272	1.38831	2.03
175.0	44.95	121.0	9.07	22000.0	0.00423	0.0601	6.51	0.00262	1.37963	1.99
180.0	43.98	115.0	8.61	19000.0	0.00452	0.0574	5.99	0.00250	1.37060	1.96
185.0	42.96	110.0	8.16	16300.0	0.00487	0.0547	5.51	0.00239	1.36116	1.94
190.0	41.88	104.0	7.72	13800.0	0.00523	0.0520	5.05	0.00226	1.35125	1.92
200.0	39.51	91.4	6.83	9340.0	0.00643	0.0465	4.18	0.00199	1.32950	1.92
205.0	38.16	84.6	6.38	7360.0	0.00742	0.0437	3.77	0.00183	1.31727	1.95
210.0	36.66	77.1	5.90	5530.0	0.00873	0.0410	3.36	0.00165	1.30366	2.00
215.0	34.90	68.7	5.38	3820.0	0.0111	0.0382	2.94	0.00143	1.28788	2.11
220.0	32.67	58.6	4.77	2220.0	0.0160	0.0355	2.49	0.00116	1.26806	2.37
225.0	29.11	44.7	3.91	727.0	0.0368	0.0332	1.93	0.000693	1.23674	3.45
230.0	12.12	30.2	2.51	114.0	0.0661	0.0189	0.843	0.000783	1.09431	3.20
235.0	9.880	33.5	2.51	204.0	0.0281	0.0148	0.799	0.00159	1.07643	1.83
240.0	8.806	36.3	2.51	255.0	0.0192	0.0134	0.786	0.00217	1.06793	1.48
245.0	8.091	38.8	2.50	290.0	0.0151	0.0126	0.781	0.00266	1.06229	1.31
250.0	7.554	41.1	2.50	316.0	0.0126	0.0121	0.781	0.00310	1.05807	1.20
255.0	7.125	43.3	2.49	337.0	0.0109	0.0118	0.784	0.00350	1.05471	1.13
260.0	6.769	45.4	2.49	354.0	0.00968	0.0116	0.788	0.00389	1.05192	1.08
265.0	6.464	47.4	2.48	368.0	0.00875	0.0114	0.793	0.00426	1.04955	1.04
270.0	6.199	49.3	2.48	380.0	0.00802	0.0113	0.799	0.00462	1.04748	1.00
275.0	5.965	51.2	2.47	391.0	0.00742	0.0113	0.805	0.00497	1.04566	0.977
280.0	5.755	53.1	2.47	400.0	0.00692	0.0112	0.812	0.00532	1.04403	0.954
285.0	5.566	54.9	2.46	408.0	0.00649	0.0112	0.820	0.00567	1.04256	0.935
290.0	5.393	56.7	2.46	415.0	0.00613	0.0113	0.827	0.00602	1.04122	0.918
295.0	5.234	58.4	2.45	421.0	0.00581	0.0113	0.835	0.00636	1.03999	0.903
300.0	5.088	60.1	2.45	427.0	0.00553	0.0113	0.843	0.00671	1.03885	0.890
310.0	4.826	63.5	2.44	437.0	0.00506	0.0115	0.860	0.00740	1.03683	0.868
320.0	4.597	66.8	2.43	445.0	0.00468	0.0116	0.877	0.00809	1.03506	0.849
330.0	4.394	70.0	2.42	452.0	0.00436	0.0118	0.895	0.00879	1.03349	0.834
340.0	4.212	73.2	2.41	458.0	0.00409	0.0120	0.913	0.00949	1.03209	0.822
350.0	4.048	76.3	2.40	463.0	0.00386	0.0121	0.930	0.0102	1.03083	0.812
360.0	3.899	79.4	2.39	468.0	0.00366	0.0123	0.948	0.0109	1.02968	0.803
370.0	3.763	82.4	2.38	471.0	0.00348	0.0125	0.966	0.0116	1.02863	0.795
380.0	3.637	85.4	2.38	475.0	0.00332	0.0127	0.984	0.0124	1.02766	0.788
390.0	3.521	88.4	2.37	478.0	0.00317	0.0129	1.00	0.0131	1.02677	0.783
400.0	3.413	91.4	2.36	481.0	0.00305	0.0131	1.02	0.0138	1.02594	0.778
410.0	3.313	94.3	2.36	483.0	0.00293	0.0133	1.04	0.0146	1.02517	0.773
420.0	3.219	97.2	2.35	485.0	0.00282	0.0135	1.06	0.0153	1.02445	0.769
430.0	3.131	100.0	2.34	487.0	0.00272	0.0138	1.07	0.0161	1.02378	0.766
440.0	3.048	103.0	2.34	489.0	0.00263	0.0140	1.09	0.0169	1.02314	0.763
450.0	2.970	106.0	2.33	490.0	0.00255	0.0142	1.11	0.0177	1.02255	0.760
460.0	2.896	109.0	2.33	492.0	0.00247	0.0144	1.13	0.0185	1.02198	0.757
470.0	2.827	111.0	2.32	493.0	0.00240	0.0146	1.14	0.0193	1.02145	0.755
480.0	2.761	114.0	2.32	494.0	0.00233	0.0148	1.16	0.0201	1.02095	0.753
490.0	2.698	117.0	2.32	495.0	0.00227	0.0150	1.18	0.0209	1.02047	0.751
500.0	2.638	120.0	2.31	496.0	0.00221	0.0152	1.19	0.0218	1.02001	0.749
510.0	2.581	123.0	2.31	497.0	0.00215	0.0154	1.21	0.0226	1.01958	0.747
520.0	2.527	125.0	2.30	498.0	0.00210	0.0156	1.23	0.0235	1.01916	0.745
530.0	2.475	128.0	2.30	499.0	0.00205	0.0158	1.24	0.0243	1.01877	0.744
540.0	2.426	131.0	2.30	500.0	0.00200	0.0160	1.26	0.0252	1.01839	0.742
550.0	2.378	134.0	2.29	500.0	0.00195	0.0162	1.28	0.0261	1.01803	0.741
560.0	2.333	136.0	2.29	501.0	0.00191	0.0164	1.29	0.0270	1.01768	0.740
570.0	2.289	139.0	2.29	501.0	0.00187	0.0166	1.31	0.0279	1.01734	0.739
580.0	2.247	142.0	2.28	502.0	0.00183	0.0168	1.33	0.0288	1.01702	0.738
590.0	2.207	144.0	2.28	502.0	0.00179	0.0170	1.34	0.0297	1.01672	0.736
600.0	2.168	147.0	2.28	503.0	0.00176	0.0172	1.36	0.0306	1.01642	0.735
700.0	1.846	174.0	2.25	506.0	0.00147	0.0191	1.51	0.0405	1.01397	0.728
800.0	1.610	201.0	2.22	507.0	0.00127	0.0211	1.65	0.0511	1.01218	0.723
900.0	1.430	229.0	2.18	508.0	0.00112	0.0229	1.79	0.0626	1.01081	0.719
1000.0	1.286	257.0	2.15	508.0	0.00100	0.0248	1.92	0.0749	1.00972	0.717
1500.0	0.8587	409.0	1.96	507.0	0.000662					
2000.0	0.6455	573.0	1.82	506.0	0.000496					
2500.0	0.5174	740.0	1.74	505.0	0.000397					
3000.0	0.4318	908.0	1.68	504.0	0.000331					
3500.0	0.3705	1070.0	1.65	503.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

510 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01865	1730.0	223.0	-62.19	-60.43	0.6016	0.2533	0.4743	3878.0
125.0	0.01888	1510.0	203.0	-59.83	-58.04	0.6211	0.2549	0.4792	3630.0
130.0	0.01912	1330.0	186.0	-57.45	-55.64	0.6399	0.2531	0.4815	3428.0
135.0	0.01939	1180.0	171.0	-55.06	-53.23	0.6581	0.2498	0.4825	3254.0
140.0	0.01967	1060.0	158.0	-52.67	-50.82	0.6757	0.2460	0.4833	3101.0
145.0	0.01997	947.0	146.0	-50.28	-48.40	0.6927	0.2424	0.4843	2962.0
150.0	0.02028	851.0	136.0	-47.89	-45.97	0.7091	0.2390	0.4859	2832.0
155.0	0.02062	766.0	126.0	-45.49	-43.54	0.7251	0.2360	0.4884	2709.0
160.0	0.02098	688.0	117.0	-43.07	-41.09	0.7406	0.2335	0.4920	2592.0
165.0	0.02137	617.0	108.0	-40.63	-38.62	0.7558	0.2314	0.4969	2478.0
170.0	0.02179	552.0	100.0	-38.17	-36.12	0.7708	0.2296	0.5032	2366.0
175.0	0.02224	491.0	93.1	-35.68	-33.58	0.7855	0.2282	0.5111	2257.0
180.0	0.02273	434.0	86.1	-33.15	-31.00	0.8000	0.2270	0.5208	2148.0
185.0	0.02325	381.0	79.4	-30.57	-28.37	0.8144	0.2261	0.5329	2040.0
190.0	0.02386	331.0	73.0	-27.92	-25.67	0.8288	0.2253	0.5478	1931.0
200.0	0.02528	239.0	60.8	-22.38	-19.99	0.8579	0.2244	0.5911	1706.0
205.0	0.02617	195.0	54.8	-19.43	-16.96	0.8729	0.2244	0.6246	1587.0
210.0	0.02723	153.0	48.9	-16.29	-13.72	0.8885	0.2247	0.6736	1459.0
215.0	0.02858	112.0	42.7	-12.87	-10.17	0.9052	0.2257	0.7541	1317.0
220.0	0.03047	71.0	36.0	-8.939	-6.061	0.9241	0.2280	0.9168	1150.0
225.0	0.03392	29.0	27.6	-3.642	-0.4391	0.9494	0.2341	1.491	925.1
230.0	0.07469	6.50	8.51	17.80	24.35	1.060	0.2520	2.897	588.5
235.0	0.09627	18.7	6.12	23.66	32.75	1.094	0.2342	1.041	621.0
240.0	0.1032	27.4	5.16	26.77	37.08	1.113	0.2242	0.7399	646.9
245.0	0.1134	34.5	4.57	29.13	40.41	1.126	0.2172	0.6083	668.8
250.0	0.1283	40.7	4.14	31.14	43.25	1.138	0.2119	0.5329	688.3
255.0	0.1363	46.2	3.81	32.91	45.78	1.148	0.2077	0.4833	705.9
260.0	0.1436	51.3	3.55	34.54	48.11	1.157	0.2043	0.4481	722.2
265.0	0.1506	56.1	3.33	36.06	50.28	1.165	0.2014	0.4217	737.4
270.0	0.1571	60.5	3.15	37.49	52.33	1.173	0.1990	0.4011	751.6
275.0	0.1634	64.7	2.99	38.86	54.30	1.180	0.1970	0.3846	765.2
280.0	0.1695	68.7	2.85	40.18	56.18	1.187	0.1952	0.3711	778.1
285.0	0.1754	72.5	2.73	41.45	58.01	1.193	0.1937	0.3598	790.4
290.0	0.1810	76.3	2.62	42.69	59.79	1.199	0.1924	0.3503	802.3
295.0	0.1866	79.9	2.52	43.89	61.52	1.205	0.1912	0.3421	813.8
300.0	0.1920	83.4	2.43	45.07	63.21	1.211	0.1901	0.3350	824.8
310.0	0.2026	90.0	2.27	47.37	66.50	1.222	0.1884	0.3233	846.0
320.0	0.2127	96.4	2.14	49.59	69.68	1.232	0.1870	0.3140	866.0
330.0	0.2226	102.0	2.02	51.76	72.78	1.241	0.1858	0.3066	885.1
340.0	0.2323	108.0	1.92	53.88	75.82	1.251	0.1849	0.3005	903.3
350.0	0.2418	114.0	1.83	55.96	78.80	1.259	0.1841	0.2954	920.8
360.0	0.2511	120.0	1.75	58.02	81.73	1.267	0.1834	0.2911	937.7
370.0	0.2602	125.0	1.68	60.04	84.62	1.275	0.1829	0.2874	954.1
380.0	0.2693	130.0	1.61	62.05	87.48	1.283	0.1824	0.2842	969.9
390.0	0.2782	136.0	1.55	64.03	90.31	1.290	0.1820	0.2814	985.3
400.0	0.2870	141.0	1.50	66.00	93.11	1.297	0.1816	0.2790	1000.0
410.0	0.2957	146.0	1.45	67.96	95.89	1.304	0.1813	0.2768	1015.0
420.0	0.3044	151.0	1.40	69.90	98.64	1.311	0.1810	0.2749	1029.0
430.0	0.3130	155.0	1.36	71.83	101.4	1.317	0.1808	0.2731	1043.0
440.0	0.3215	160.0	1.32	73.74	104.1	1.324	0.1806	0.2716	1057.0
450.0	0.3300	165.0	1.28	75.65	106.8	1.330	0.1804	0.2702	1070.0
460.0	0.3384	170.0	1.24	77.56	109.5	1.336	0.1802	0.2689	1083.0
470.0	0.3467	174.0	1.21	79.45	112.2	1.341	0.1801	0.2678	1096.0
480.0	0.3550	179.0	1.18	81.34	114.9	1.347	0.1799	0.2667	1109.0
490.0	0.3633	184.0	1.15	83.22	117.5	1.353	0.1798	0.2657	1121.0
500.0	0.3715	188.0	1.12	85.09	120.2	1.358	0.1797	0.2649	1133.0
510.0	0.3797	193.0	1.09	86.96	122.8	1.363	0.1796	0.2640	1145.0
520.0	0.3879	197.0	1.07	88.83	125.5	1.368	0.1795	0.2633	1157.0
530.0	0.3960	202.0	1.04	90.69	128.1	1.373	0.1794	0.2626	1169.0
540.0	0.4042	206.0	1.02	92.55	130.7	1.378	0.1794	0.2620	1181.0
550.0	0.4122	210.0	1.00	94.40	133.3	1.383	0.1793	0.2614	1192.0
560.0	0.4203	215.0	0.978	96.25	135.9	1.388	0.1793	0.2608	1203.0
570.0	0.4283	219.0	0.958	98.10	138.5	1.392	0.1792	0.2603	1214.0
580.0	0.4363	223.0	0.939	99.9	141.1	1.397	0.1792	0.2599	1225.0
590.0	0.4443	228.0	0.920	101.8	143.7	1.401	0.1792	0.2594	1236.0
600.0	0.4523	232.0	0.903	103.6	146.3	1.406	0.1792	0.2590	1247.0
700.0	0.5312	274.0	0.760	121.9	172.1	1.445	0.1794	0.2564	1347.0
800.0	0.6089	315.0	0.657	140.2	197.7	1.479	0.1803	0.2557	1438.0
900.0	0.6860	355.0	0.580	158.5	223.3	1.510	0.1820	0.2562	1522.0
1000.0	0.7626	395.0	0.519	176.9	248.9	1.537	0.1841	0.2576	1600.0
1500.0	1.142	590.0	0.342	273.0	380.8	1.643	0.1991	0.2708	1929.0
2000.0	1.519	783.0	0.256	376.2	513.7	1.723	0.2128	0.2841	2201.0
2500.0	1.895	976.0	0.204	485.3	664.3	1.788	0.2226	0.2937	2442.0
3000.0	2.271	1170.0	0.170	598.4	812.9	1.842	0.2294	0.3004	2661.0
3500.0	2.647	1360.0	0.146	714.4	964.4	1.889	0.2341	0.3051	2864.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

510 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)/V)_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.63	198.0	16.4	92900.0	0.00240	0.0923	18.0	0.00363	1.46173	3.32
125.0	52.98	189.0	15.0	80100.0	0.00253	0.0893	15.5	0.00352	1.45543	3.00
130.0	52.29	180.0	14.1	69700.0	0.00267	0.0863	13.8	0.00343	1.44889	2.77
135.0	51.58	172.0	13.3	61000.0	0.00280	0.0832	12.5	0.00334	1.44210	2.61
140.0	50.84	164.0	12.6	53700.0	0.00294	0.0802	11.5	0.00327	1.43510	2.50
145.0	50.08	157.0	12.1	47400.0	0.00309	0.0773	10.5	0.00319	1.42788	2.36
150.0	49.30	150.0	11.5	42000.0	0.00323	0.0743	9.63	0.00310	1.42045	2.27
155.0	48.49	144.0	11.0	37100.0	0.00339	0.0714	8.93	0.00302	1.41281	2.20
160.0	47.66	138.0	10.5	32800.0	0.00355	0.0686	8.26	0.00292	1.40495	2.13
165.0	46.79	132.0	10.0	28900.0	0.00375	0.0657	7.64	0.00283	1.39685	2.08
170.0	45.90	127.0	9.53	25300.0	0.00397	0.0630	7.06	0.00273	1.38848	2.03
175.0	44.97	121.0	9.07	22100.0	0.00422	0.0602	6.52	0.00262	1.37982	1.99
180.0	44.00	116.0	8.62	19100.0	0.00451	0.0575	6.01	0.00251	1.37081	1.96
185.0	42.99	110.0	8.17	16400.0	0.00483	0.0548	5.52	0.00239	1.36140	1.93
190.0	41.91	104.0	7.73	13900.0	0.00526	0.0520	5.06	0.00227	1.35152	1.92
200.0	39.55	91.7	6.85	9430.0	0.00644	0.0466	4.20	0.00199	1.32988	1.92
205.0	38.22	85.0	6.39	7460.0	0.00735	0.0439	3.78	0.00184	1.31774	1.94
210.0	36.72	77.6	5.92	5630.0	0.00869	0.0411	3.38	0.00166	1.30425	1.99
215.0	34.99	69.3	5.40	3920.0	0.0109	0.0383	2.96	0.00145	1.28869	2.10
220.0	32.82	59.4	4.81	2330.0	0.0154	0.0357	2.52	0.00118	1.26933	2.33
225.0	29.48	46.2	4.00	855.0	0.0322	0.0333	1.98	0.000757	1.23998	3.20
230.0	13.39	29.6	2.52	87.1	0.0977	0.0216	0.878	0.000558	1.10456	4.23
235.0	10.39	33.1	2.52	195.0	0.0315	0.0155	0.811	0.00143	1.08047	1.96
240.0	9.162	35.9	2.51	251.0	0.0206	0.0134	0.794	0.00203	1.07074	1.54
245.0	8.375	38.5	2.51	289.0	0.0158	0.0129	0.788	0.00253	1.06453	1.34
250.0	7.796	40.8	2.51	317.0	0.0131	0.0123	0.787	0.00297	1.05997	1.22
255.0	7.339	43.0	2.50	339.0	0.0112	0.0120	0.788	0.00337	1.05639	1.15
260.0	6.962	45.1	2.50	357.0	0.00993	0.0117	0.792	0.00376	1.05343	1.09
265.0	6.641	47.1	2.49	372.0	0.00895	0.0116	0.797	0.00412	1.05093	1.05
270.0	6.364	49.1	2.48	385.0	0.00817	0.0114	0.802	0.00448	1.04876	1.01
275.0	6.119	51.0	2.48	396.0	0.00755	0.0114	0.809	0.00483	1.04685	0.985
280.0	5.900	52.8	2.47	406.0	0.00702	0.0113	0.815	0.00518	1.04515	0.961
285.0	5.703	54.6	2.47	414.0	0.00659	0.0113	0.823	0.00552	1.04362	0.941
290.0	5.523	56.4	2.46	421.0	0.00621	0.0113	0.830	0.00586	1.04223	0.923
295.0	5.359	58.2	2.46	428.0	0.00588	0.0114	0.838	0.00620	1.04095	0.908
300.0	5.208	59.9	2.45	434.0	0.00559	0.0114	0.846	0.00654	1.03978	0.894
310.0	4.937	63.3	2.44	444.0	0.00511	0.0115	0.862	0.00722	1.03768	0.871
320.0	4.700	66.6	2.43	453.0	0.00472	0.0117	0.879	0.00790	1.03585	0.852
330.0	4.491	69.8	2.42	460.0	0.00439	0.0118	0.897	0.00859	1.03424	0.837
340.0	4.305	73.0	2.41	466.0	0.00412	0.0120	0.914	0.00928	1.03280	0.824
350.0	4.136	76.1	2.40	472.0	0.00388	0.0122	0.932	0.0100	1.03150	0.813
360.0	3.983	79.2	2.40	476.0	0.00367	0.0124	0.950	0.0107	1.03032	0.804
370.0	3.843	82.3	2.39	480.0	0.00349	0.0126	0.968	0.0114	1.02924	0.796
380.0	3.714	85.3	2.38	484.0	0.00333	0.0128	0.986	0.0121	1.02825	0.790
390.0	3.595	88.3	2.37	487.0	0.00319	0.0130	1.00	0.0128	1.02734	0.784
400.0	3.484	91.2	2.37	490.0	0.00306	0.0132	1.02	0.0135	1.02649	0.779
410.0	3.381	94.2	2.36	492.0	0.00294	0.0134	1.04	0.0143	1.02570	0.774
420.0	3.285	97.1	2.35	495.0	0.00283	0.0136	1.06	0.0150	1.02496	0.770
430.0	3.195	100.0	2.35	497.0	0.00273	0.0138	1.07	0.0158	1.02427	0.767
440.0	3.110	103.0	2.34	498.0	0.00264	0.0140	1.09	0.0166	1.02362	0.763
450.0	3.031	106.0	2.34	500.0	0.00256	0.0142	1.11	0.0173	1.02301	0.760
460.0	2.955	109.0	2.33	502.0	0.00248	0.0144	1.13	0.0181	1.02244	0.758
470.0	2.884	111.0	2.33	503.0	0.00240	0.0146	1.14	0.0189	1.02189	0.755
480.0	2.817	114.0	2.32	504.0	0.00234	0.0148	1.16	0.0197	1.02137	0.753
490.0	2.752	117.0	2.32	505.0	0.00227	0.0150	1.18	0.0205	1.02088	0.751
500.0	2.691	120.0	2.32	506.0	0.00221	0.0152	1.20	0.0213	1.02042	0.749
510.0	2.633	123.0	2.31	507.0	0.00215	0.0154	1.21	0.0222	1.01997	0.747
520.0	2.578	125.0	2.31	508.0	0.00210	0.0156	1.23	0.0230	1.01955	0.746
530.0	2.525	128.0	2.30	509.0	0.00205	0.0158	1.25	0.0239	1.01914	0.744
540.0	2.474	131.0	2.30	510.0	0.00200	0.0160	1.26	0.0247	1.01876	0.743
550.0	2.426	134.0	2.30	510.0	0.00196	0.0162	1.28	0.0256	1.01839	0.741
560.0	2.379	136.0	2.29	511.0	0.00191	0.0164	1.29	0.0265	1.01803	0.740
570.0	2.335	139.0	2.29	511.0	0.00187	0.0166	1.31	0.0273	1.01769	0.739
580.0	2.292	142.0	2.29	512.0	0.00183	0.0168	1.33	0.0282	1.01737	0.738
590.0	2.251	144.0	2.28	512.0	0.00180	0.0170	1.34	0.0291	1.01705	0.737
600.0	2.211	147.0	2.28	513.0	0.00176	0.0172	1.36	0.0301	1.01675	0.736
700.0	1.883	174.0	2.25	516.0	0.00147	0.0192	1.51	0.0397	1.01425	0.728
800.0	1.642	201.0	2.22	517.0	0.00127	0.0211	1.65	0.0502	1.01242	0.723
900.0	1.458	229.0	2.19	518.0	0.00112	0.0229	1.79	0.0614	1.01102	0.720
1000.0	1.311	257.0	2.15	518.0	0.00100	0.0248	1.92	0.0735	1.00991	0.717
1500.0	0.8756	409.0	1.96	517.0	0.000602					
2000.0	0.6583	573.0	1.83	516.0	0.000436					
2500.0	0.5276	740.0	1.74	515.0	0.000337					
3000.0	0.4403	908.0	1.68	514.0	0.000331					
3500.0	0.3778	1070.0	1.65	513.0	0.000234					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

520 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01364	1730.0	223.0	-62.20	-60.40	0.6015	0.2535	0.4742	3877.0
125.0	0.01387	1510.0	203.0	-59.84	-58.02	0.6210	0.2551	0.4791	3630.0
130.0	0.01312	1330.0	186.0	-57.46	-55.62	0.6398	0.2533	0.4813	3428.0
135.0	0.01338	1190.0	171.0	-55.08	-53.21	0.6580	0.2500	0.4824	3255.0
140.0	0.01366	1060.0	158.0	-52.69	-50.79	0.6756	0.2462	0.4831	3102.0
145.0	0.01395	949.0	146.0	-50.30	-48.38	0.6925	0.2425	0.4841	2963.0
150.0	0.02028	853.0	136.0	-47.91	-45.95	0.7090	0.2391	0.4856	2833.0
155.0	0.02062	767.0	126.0	-45.50	-43.52	0.7249	0.2362	0.4881	2711.0
160.0	0.02098	690.0	117.0	-43.09	-41.07	0.7405	0.2336	0.4917	2594.0
165.0	0.02136	619.0	108.0	-40.66	-38.60	0.7557	0.2315	0.4965	2480.0
170.0	0.02178	554.0	101.0	-38.20	-36.10	0.7706	0.2298	0.5027	2369.0
175.0	0.02223	493.0	93.2	-35.71	-33.57	0.7853	0.2283	0.5106	2260.0
180.0	0.02271	436.0	86.2	-33.18	-30.99	0.7998	0.2271	0.5202	2151.0
185.0	0.02325	383.0	79.5	-30.60	-28.36	0.8142	0.2261	0.5321	2043.0
190.0	0.02384	333.0	73.2	-27.96	-25.67	0.8286	0.2254	0.5468	1935.0
200.0	0.02525	241.0	61.0	-22.44	-20.01	0.8576	0.2245	0.5893	1711.0
205.0	0.02613	198.0	55.0	-19.50	-16.98	0.8725	0.2244	0.6219	1593.0
210.0	0.02718	156.0	49.1	-16.38	-13.76	0.8881	0.2247	0.6694	1466.0
215.0	0.02851	115.0	43.0	-12.99	-10.24	0.9046	0.2256	0.7462	1327.0
220.0	0.03034	74.1	36.4	-9.114	-6.192	0.9233	0.2277	0.8973	1163.0
225.0	0.03353	32.9	28.3	-4.035	-0.8053	0.9475	0.2332	1.377	948.4
230.0	0.06490	3.73	10.1	14.87	21.12	1.043	0.2573	5.161	588.8
235.0	0.09131	16.7	6.55	22.77	31.56	1.088	0.2368	1.166	618.0
240.0	0.1048	25.8	5.44	26.16	36.26	1.108	0.2260	0.7862	644.4
245.0	0.1153	33.1	4.77	28.66	39.77	1.123	0.2186	0.6337	666.8
250.0	0.1243	39.5	4.31	30.74	42.71	1.135	0.2130	0.5493	686.6
255.0	0.1323	45.1	3.95	32.57	45.31	1.145	0.2086	0.4950	704.5
260.0	0.1397	50.3	3.67	34.23	47.68	1.154	0.2051	0.4570	720.9
265.0	0.1466	55.2	3.44	35.78	49.89	1.163	0.2021	0.4287	736.3
270.0	0.1531	59.7	3.25	37.23	51.98	1.170	0.1996	0.4069	750.7
275.0	0.1594	63.9	3.08	38.62	53.97	1.178	0.1975	0.3894	764.4
280.0	0.1654	68.0	2.93	39.95	55.88	1.185	0.1957	0.3752	777.4
285.0	0.1712	71.9	2.81	41.24	57.73	1.191	0.1941	0.3634	789.8
290.0	0.1768	75.7	2.69	42.49	59.52	1.197	0.1927	0.3534	801.8
295.0	0.1823	79.3	2.59	43.71	61.26	1.203	0.1915	0.3448	813.3
300.0	0.1877	82.8	2.49	44.89	62.97	1.209	0.1904	0.3374	824.5
310.0	0.1981	89.5	2.33	47.20	66.28	1.220	0.1886	0.3253	845.7
320.0	0.2081	95.9	2.19	49.44	69.48	1.230	0.1872	0.3157	865.8
330.0	0.2179	102.0	2.07	51.62	72.60	1.240	0.1860	0.3080	885.0
340.0	0.2274	108.0	1.97	53.75	75.65	1.249	0.1850	0.3017	903.3
350.0	0.2368	114.0	1.87	55.84	78.64	1.257	0.1842	0.2965	920.9
360.0	0.2459	119.0	1.79	57.90	81.58	1.266	0.1836	0.2920	937.8
370.0	0.2549	125.0	1.72	59.93	84.48	1.274	0.1830	0.2882	954.2
380.0	0.2638	130.0	1.65	61.94	87.35	1.281	0.1825	0.2850	970.1
390.0	0.2726	135.0	1.59	63.93	90.18	1.289	0.1821	0.2821	985.5
400.0	0.2813	140.0	1.53	65.90	92.99	1.296	0.1817	0.2796	1001.0
410.0	0.2899	145.0	1.48	67.86	95.77	1.303	0.1814	0.2774	1015.0
420.0	0.2984	150.0	1.43	69.81	98.54	1.309	0.1811	0.2754	1029.0
430.0	0.3068	155.0	1.39	71.74	101.3	1.316	0.1808	0.2736	1043.0
440.0	0.3152	160.0	1.34	73.66	104.0	1.322	0.1806	0.2721	1057.0
450.0	0.3235	165.0	1.31	75.57	106.7	1.328	0.1804	0.2706	1070.0
460.0	0.3317	170.0	1.27	77.48	109.4	1.334	0.1803	0.2693	1084.0
470.0	0.3400	174.0	1.24	79.37	112.1	1.340	0.1801	0.2681	1097.0
480.0	0.3481	179.0	1.20	81.26	114.8	1.346	0.1800	0.2671	1109.0
490.0	0.3563	184.0	1.17	83.15	117.5	1.351	0.1798	0.2661	1122.0
500.0	0.3643	188.0	1.14	85.02	120.1	1.356	0.1797	0.2652	1134.0
510.0	0.3724	193.0	1.12	86.90	122.8	1.362	0.1796	0.2644	1146.0
520.0	0.3804	197.0	1.09	88.76	125.4	1.367	0.1795	0.2636	1158.0
530.0	0.3884	202.0	1.07	90.63	128.0	1.372	0.1795	0.2629	1170.0
540.0	0.3964	206.0	1.04	92.49	130.7	1.377	0.1794	0.2622	1181.0
550.0	0.4043	210.0	1.02	94.34	133.3	1.381	0.1793	0.2616	1192.0
560.0	0.4122	215.0	1.00	96.19	135.9	1.386	0.1793	0.2611	1204.0
570.0	0.4201	219.0	0.978	98.04	138.5	1.391	0.1793	0.2606	1215.0
580.0	0.4280	223.0	0.958	99.9	141.1	1.395	0.1792	0.2601	1226.0
590.0	0.4358	228.0	0.940	101.7	143.7	1.400	0.1792	0.2596	1237.0
600.0	0.4436	232.0	0.922	103.6	146.3	1.404	0.1792	0.2592	1247.0
700.0	0.5211	274.0	0.775	121.9	172.1	1.444	0.1794	0.2566	1348.0
800.0	0.5974	315.0	0.670	140.1	197.7	1.478	0.1804	0.2558	1439.0
900.0	0.6730	355.0	0.591	158.5	223.3	1.508	0.1820	0.2562	1523.0
1000.0	0.7481	395.0	0.529	176.9	249.9	1.535	0.1842	0.2576	1601.0
1500.0	1.120	591.0	0.349	273.0	380.9	1.642	0.1991	0.2709	1930.0
2000.0	1.490	784.0	0.261	376.2	519.7	1.722	0.2128	0.2841	2202.0
2500.0	1.853	976.0	0.208	485.3	664.3	1.786	0.2226	0.2937	2442.0
3000.0	2.228	1170.0	0.173	598.4	812.9	1.841	0.2294	0.3004	2662.0
3500.0	2.596	1360.0	0.149	714.4	964.4	1.887	0.2341	0.3051	2865.0

* TWO-PHASE BOUNDARY

520 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DV)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.64	198.0	16.4	93100.0	0.00239	0.0923	18.0	0.00363	1.46178	3.33
125.0	52.38	190.0	15.0	80200.0	0.00253	0.0893	15.6	0.00352	1.45550	3.00
130.0	52.30	181.0	14.0	69800.0	0.00266	0.0863	13.8	0.00343	1.44896	2.77
135.0	51.59	172.0	13.3	61100.0	0.00280	0.0833	12.5	0.00335	1.44219	2.61
140.0	50.85	164.0	12.6	53800.0	0.00294	0.0803	11.5	0.00327	1.43519	2.50
145.0	50.10	157.0	12.0	47500.0	0.00308	0.0773	10.5	0.00319	1.42798	2.36
150.0	49.31	151.0	11.5	42100.0	0.00323	0.0744	9.64	0.00311	1.42056	2.27
155.0	48.50	144.0	11.0	37200.0	0.00339	0.0715	8.94	0.00302	1.41293	2.20
160.0	47.67	138.0	10.5	32900.0	0.00355	0.0686	8.27	0.00293	1.40509	2.13
165.0	46.81	133.0	10.0	29000.0	0.00374	0.0658	7.65	0.00283	1.39700	2.08
170.0	45.92	127.0	9.54	25400.0	0.00396	0.0630	7.07	0.00273	1.38865	2.03
175.0	44.99	121.0	9.07	22200.0	0.00420	0.0603	6.53	0.00262	1.38001	1.99
180.0	44.02	116.0	8.62	19200.0	0.00449	0.0575	6.02	0.00251	1.37102	1.96
185.0	43.01	110.0	8.18	16500.0	0.00483	0.0548	5.53	0.00240	1.36165	1.93
190.0	41.94	104.0	7.74	14000.0	0.00524	0.0521	5.07	0.00227	1.35180	1.92
200.0	39.59	92.1	6.86	9530.0	0.00640	0.0467	4.21	0.00200	1.33026	1.91
205.0	38.27	85.4	6.41	7560.0	0.00728	0.0440	3.80	0.00185	1.31820	1.93
210.0	36.79	78.1	5.94	5730.0	0.00857	0.0412	3.39	0.00167	1.30484	1.98
215.0	35.08	69.9	5.43	4030.0	0.0107	0.0384	2.98	0.00147	1.28948	2.08
220.0	32.95	60.3	4.85	2440.0	0.0149	0.0358	2.55	0.00121	1.27055	2.30
225.0	29.80	47.7	4.07	980.0	0.0289	0.0334	2.03	0.000814	1.24281	3.01
230.0	15.41	29.4	2.55	57.5	0.176	0.0265	0.941	0.000333	1.12098	6.60
235.0	10.95	32.6	2.52	183.0	0.0357	0.0163	0.825	0.00128	1.08497	2.12
240.0	9.538	35.5	2.52	246.0	0.0221	0.0142	0.803	0.00190	1.07372	1.60
245.0	8.671	38.1	2.52	287.0	0.0166	0.0132	0.795	0.00240	1.06686	1.38
250.0	8.046	40.5	2.51	317.0	0.0136	0.0126	0.792	0.00284	1.06194	1.25
255.0	7.558	42.7	2.51	341.0	0.0116	0.0121	0.793	0.00325	1.05810	1.16
260.0	7.158	44.8	2.50	360.0	0.0102	0.0119	0.796	0.00363	1.05497	1.10
265.0	6.821	46.9	2.50	376.0	0.00915	0.0117	0.800	0.00399	1.05233	1.06
270.0	6.530	48.8	2.49	390.0	0.00833	0.0115	0.806	0.00435	1.05006	1.02
275.0	6.274	50.7	2.49	401.0	0.00768	0.0115	0.812	0.00469	1.04807	0.992
280.0	6.046	52.6	2.48	411.0	0.00713	0.0114	0.818	0.00504	1.04629	0.968
285.0	5.841	54.4	2.47	420.0	0.00668	0.0114	0.825	0.00537	1.04470	0.947
290.0	5.655	56.2	2.47	428.0	0.00629	0.0114	0.833	0.00571	1.04325	0.929
295.0	5.485	58.0	2.46	435.0	0.00595	0.0114	0.840	0.00605	1.04193	0.913
300.0	5.328	59.7	2.46	441.0	0.00565	0.0115	0.848	0.00638	1.04071	0.898
310.0	5.048	63.1	2.45	452.0	0.00516	0.0116	0.865	0.00705	1.03854	0.874
320.0	4.804	66.4	2.44	461.0	0.00476	0.0117	0.882	0.00772	1.03666	0.855
330.0	4.583	69.6	2.43	468.0	0.00442	0.0119	0.899	0.00840	1.03500	0.839
340.0	4.397	72.8	2.42	475.0	0.00414	0.0120	0.916	0.00908	1.03351	0.826
350.0	4.224	76.0	2.41	480.0	0.00390	0.0122	0.934	0.00977	1.03218	0.815
360.0	4.066	79.1	2.40	485.0	0.00369	0.0124	0.952	0.0105	1.03096	0.806
370.0	3.923	82.1	2.39	489.0	0.00351	0.0126	0.969	0.0112	1.02986	0.798
380.0	3.791	85.2	2.38	493.0	0.00335	0.0128	0.987	0.0119	1.02884	0.791
390.0	3.669	88.2	2.38	496.0	0.00320	0.0130	1.01	0.0126	1.02790	0.785
400.0	3.555	91.1	2.37	499.0	0.00307	0.0132	1.02	0.0133	1.02703	0.780
410.0	3.450	94.1	2.36	502.0	0.00295	0.0134	1.04	0.0140	1.02623	0.775
420.0	3.352	97.0	2.36	504.0	0.00284	0.0136	1.06	0.0147	1.02547	0.771
430.0	3.259	100.0	2.35	506.0	0.00274	0.0138	1.08	0.0155	1.02476	0.767
440.0	3.173	103.0	2.35	508.0	0.00265	0.0140	1.09	0.0162	1.02410	0.764
450.0	3.091	106.0	2.34	510.0	0.00256	0.0142	1.11	0.0170	1.02348	0.761
460.0	3.014	108.0	2.34	511.0	0.00248	0.0144	1.13	0.0178	1.02289	0.758
470.0	2.942	111.0	2.33	513.0	0.00241	0.0146	1.15	0.0185	1.02233	0.756
480.0	2.872	114.0	2.33	514.0	0.00234	0.0148	1.16	0.0193	1.02180	0.754
490.0	2.807	117.0	2.32	515.0	0.00228	0.0150	1.18	0.0201	1.02130	0.751
500.0	2.745	120.0	2.32	516.0	0.00222	0.0152	1.20	0.0209	1.02082	0.750
510.0	2.685	122.0	2.31	517.0	0.00216	0.0154	1.21	0.0217	1.02037	0.748
520.0	2.629	125.0	2.31	518.0	0.00210	0.0156	1.23	0.0226	1.01994	0.746
530.0	2.575	128.0	2.31	519.0	0.00205	0.0158	1.25	0.0234	1.01952	0.745
540.0	2.523	131.0	2.30	520.0	0.00201	0.0160	1.26	0.0242	1.01913	0.743
550.0	2.473	134.0	2.30	520.0	0.00196	0.0162	1.28	0.0251	1.01875	0.742
560.0	2.426	136.0	2.30	521.0	0.00192	0.0164	1.30	0.0260	1.01839	0.740
570.0	2.380	139.0	2.29	522.0	0.00187	0.0166	1.31	0.0268	1.01804	0.739
580.0	2.337	142.0	2.29	522.0	0.00184	0.0168	1.33	0.0277	1.01771	0.738
590.0	2.295	144.0	2.29	523.0	0.00180	0.0170	1.34	0.0286	1.01739	0.737
600.0	2.254	147.0	2.28	523.0	0.00176	0.0172	1.36	0.0295	1.01708	0.736
700.0	1.919	174.0	2.25	526.0	0.00147	0.0192	1.51	0.0390	1.01453	0.728
800.0	1.674	201.0	2.22	528.0	0.00127	0.0211	1.66	0.0492	1.01266	0.723
900.0	1.486	229.0	2.19	528.0	0.00112	0.0230	1.79	0.0603	1.01123	0.720
1000.0	1.337	257.0	2.15	528.0	0.00100	0.0248	1.92	0.0721	1.01010	0.717
1500.0	0.8926	409.0	1.96	527.0	0.000661					
2000.0	0.6711	573.0	1.83	526.0	0.000496					
2500.0	0.5379	740.0	1.74	525.0	0.000397					
3000.0	0.4489	908.0	1.68	524.0	0.000331					
3500.0	0.3852	1080.0	1.65	524.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

530 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
120.0	0.01364	1740.0	223.0	-62.21	-61.38	0.6014	0.2538	0.4740	3877.0
125.0	0.01387	1520.0	208.0	-59.65	-59.00	0.6203	0.2553	0.4789	3630.0
130.0	0.01412	1340.0	166.0	-57.47	-56.60	0.6367	0.2535	0.4812	3428.0
135.0	0.01435	1190.0	171.0	-55.03	-53.13	0.6573	0.2502	0.4822	3256.0
140.0	0.01465	1060.0	158.0	-52.70	-51.77	0.6755	0.2464	0.4823	3103.0
145.0	0.01495	951.0	146.0	-50.32	-49.36	0.6924	0.2427	0.4839	2964.0
150.0	0.02027	859.0	136.0	-47.92	-46.93	0.7089	0.2393	0.4854	2835.0
155.0	0.02061	769.0	126.0	-45.52	-43.50	0.7248	0.2363	0.4879	2713.0
160.0	0.02097	692.0	117.0	-43.11	-41.05	0.7404	0.2338	0.4914	2596.0
165.0	0.02135	621.0	109.0	-40.68	-38.59	0.7555	0.2316	0.4962	2482.0
170.0	0.02177	555.0	101.0	-38.23	-36.08	0.7704	0.2299	0.5023	2371.0
175.0	0.02222	495.0	93.3	-35.74	-33.56	0.7851	0.2284	0.5100	2262.0
160.0	0.02270	438.0	85.3	-33.21	-30.99	0.7996	0.2272	0.5196	2154.0
185.0	0.02324	385.0	79.7	-30.64	-28.36	0.8140	0.2262	0.5313	2047.0
190.0	0.02382	335.0	73.3	-28.01	-25.67	0.8284	0.2254	0.5458	1939.0
200.0	0.02523	243.0	61.2	-22.50	-20.02	0.8573	0.2245	0.5875	1716.0
205.0	0.02610	200.0	55.3	-19.57	-17.01	0.8722	0.2244	0.6194	1599.0
210.0	0.02714	158.0	49.3	-16.47	-13.80	0.8876	0.2247	0.6653	1473.0
215.0	0.02844	116.0	43.3	-13.10	-10.31	0.9041	0.2255	0.7388	1336.0
220.0	0.03022	77.2	36.8	-9.283	-6.317	0.9225	0.2275	0.8795	1176.0
225.0	0.03323	36.6	29.0	-4.398	-1.126	0.9458	0.2324	1.290	969.7
230.0	0.05274	2.45	13.0	10.14	15.31	1.016	0.2588	6.427	608.0
235.0	0.08630	14.7	7.04	21.77	30.24	1.082	0.2396	1.328	615.2
240.0	0.1006	24.2	5.73	25.53	35.40	1.104	0.2279	0.8393	642.1
245.0	0.1114	31.7	4.99	28.17	39.10	1.119	0.2200	0.6614	664.9
250.0	0.1204	38.3	4.46	30.33	42.15	1.132	0.2141	0.5568	685.0
255.0	0.1285	44.1	4.10	32.21	44.82	1.142	0.2095	0.5074	703.1
260.0	0.1359	49.4	3.80	33.92	47.25	1.152	0.2058	0.4663	719.7
265.0	0.1428	54.3	3.56	35.49	49.50	1.160	0.2028	0.4360	735.2
270.0	0.1493	58.8	3.35	36.97	51.62	1.168	0.2002	0.4128	749.8
275.0	0.1555	63.2	3.17	38.38	53.64	1.175	0.1980	0.3944	763.6
280.0	0.1614	67.3	3.02	39.73	55.57	1.182	0.1961	0.3794	776.7
285.0	0.1672	71.3	2.89	41.03	57.44	1.189	0.1945	0.3670	789.2
290.0	0.1728	75.0	2.77	42.29	59.25	1.195	0.1931	0.3565	801.3
295.0	0.1782	78.7	2.66	43.52	61.01	1.201	0.1918	0.3476	812.9
300.0	0.1835	82.2	2.56	44.71	62.72	1.207	0.1907	0.3399	824.1
310.0	0.1938	89.0	2.39	47.04	66.06	1.218	0.1889	0.3273	845.5
320.0	0.2037	95.5	2.25	49.29	69.28	1.228	0.1874	0.3174	865.7
330.0	0.2133	102.0	2.12	51.47	72.41	1.238	0.1862	0.3095	884.9
340.0	0.2227	108.0	2.01	53.61	75.47	1.247	0.1852	0.3030	903.3
350.0	0.2319	113.0	1.92	55.71	78.48	1.256	0.1844	0.2976	920.9
360.0	0.2409	119.0	1.83	57.78	81.43	1.264	0.1837	0.2930	937.9
370.0	0.2498	124.0	1.76	59.82	84.34	1.272	0.1831	0.2891	954.4
380.0	0.2586	130.0	1.69	61.84	87.21	1.280	0.1826	0.2858	970.3
390.0	0.2672	135.0	1.62	63.83	90.05	1.287	0.1822	0.2828	985.8
400.0	0.2757	140.0	1.57	65.81	92.87	1.294	0.1818	0.2803	1001.0
410.0	0.2842	145.0	1.51	67.77	95.66	1.301	0.1815	0.2780	1015.0
420.0	0.2926	150.0	1.46	69.72	98.43	1.308	0.1812	0.2760	1030.0
430.0	0.3009	155.0	1.42	71.65	101.2	1.314	0.1809	0.2742	1044.0
440.0	0.3091	160.0	1.37	73.58	103.9	1.321	0.1807	0.2725	1057.0
450.0	0.3173	165.0	1.33	75.49	106.6	1.327	0.1805	0.2711	1071.0
460.0	0.3254	170.0	1.30	77.40	109.3	1.333	0.1803	0.2697	1084.0
470.0	0.3335	174.0	1.26	79.30	112.0	1.338	0.1802	0.2685	1097.0
480.0	0.3415	179.0	1.23	81.19	114.7	1.344	0.1800	0.2674	1110.0
490.0	0.3495	183.0	1.20	83.08	117.4	1.350	0.1799	0.2664	1122.0
500.0	0.3574	188.0	1.17	84.96	120.0	1.355	0.1798	0.2655	1134.0
510.0	0.3653	193.0	1.14	86.83	122.7	1.360	0.1797	0.2647	1146.0
520.0	0.3732	197.0	1.11	88.70	125.3	1.365	0.1796	0.2639	1158.0
530.0	0.3811	202.0	1.09	90.56	123.0	1.370	0.1795	0.2632	1170.0
540.0	0.3889	206.0	1.06	92.43	130.6	1.375	0.1794	0.2625	1182.0
550.0	0.3967	210.0	1.04	94.28	133.2	1.380	0.1794	0.2619	1193.0
560.0	0.4045	215.0	1.02	96.14	133.3	1.385	0.1793	0.2613	1204.0
570.0	0.4122	219.0	1.00	97.99	133.4	1.389	0.1793	0.2608	1215.0
580.0	0.4199	224.0	0.978	99.8	141.3	1.394	0.1793	0.2603	1226.0
590.0	0.4276	228.0	0.959	101.7	143.8	1.398	0.1792	0.2599	1237.0
600.0	0.4353	232.0	0.940	103.5	146.2	1.403	0.1792	0.2594	1248.0
700.0	0.5113	274.0	0.791	121.8	172.0	1.442	0.1794	0.2567	1348.0
800.0	0.5863	315.0	0.684	140.1	197.6	1.477	0.1804	0.2559	1440.0
900.0	0.6605	356.0	0.603	158.4	223.2	1.507	0.1820	0.2563	1523.0
1000.0	0.7342	396.0	0.540	176.9	248.9	1.534	0.1842	0.2577	1601.0
1500.0	1.100	591.0	0.356	273.0	380.3	1.641	0.1991	0.2709	1930.0
2000.0	1.462	784.0	0.267	376.2	513.7	1.720	0.2128	0.2841	2202.0
2500.0	1.824	976.0	0.212	485.3	654.3	1.785	0.2226	0.2937	2443.0
3000.0	2.186	1170.0	0.177	598.4	811.0	1.839	0.2294	0.3004	2662.0
3500.0	2.547	1360.0	0.151	714.4	984.4	1.888	0.2341	0.3051	2865.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

530 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DU)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.64	198.0	16.4	93200.0	0.00239	0.0923	18.0	0.00363	1.46184	3.33
125.0	52.99	190.0	15.0	80400.0	0.00252	0.0893	15.6	0.00352	1.45556	3.01
130.0	52.31	181.0	14.0	69300.0	0.00266	0.0863	13.8	0.00343	1.44903	2.77
135.0	51.60	172.0	13.3	61200.0	0.00280	0.0833	12.5	0.00335	1.44227	2.61
140.0	50.86	165.0	12.6	53900.0	0.00293	0.0803	11.5	0.00327	1.43528	2.50
145.0	50.11	157.0	12.0	47600.0	0.00307	0.0774	10.5	0.00319	1.42808	2.37
150.0	49.32	151.0	11.5	42200.0	0.00322	0.0744	9.66	0.00311	1.42067	2.27
155.0	48.52	145.0	11.0	37300.0	0.00338	0.0715	8.95	0.00302	1.41306	2.20
160.0	47.69	139.0	10.5	33000.0	0.00355	0.0687	8.29	0.00293	1.40522	2.13
165.0	46.83	133.0	10.0	29100.0	0.00373	0.0659	7.67	0.00283	1.39715	2.08
170.0	45.94	127.0	9.54	25500.0	0.00395	0.0631	7.09	0.00273	1.38882	2.03
175.0	45.01	122.0	9.08	22300.0	0.00419	0.0603	6.54	0.00263	1.38020	1.99
180.0	44.05	116.0	8.63	19300.0	0.00448	0.0576	6.03	0.00252	1.37124	1.96
185.0	43.04	110.0	8.19	16600.0	0.00481	0.0549	5.54	0.00240	1.36189	1.93
190.0	41.97	105.0	7.75	14100.0	0.00521	0.0522	5.09	0.00228	1.35208	1.91
200.0	39.63	92.5	6.87	9630.0	0.00635	0.0468	4.22	0.00201	1.33064	1.91
205.0	38.32	85.8	6.43	7660.0	0.00721	0.0441	3.81	0.00186	1.31866	1.93
210.0	36.85	78.6	5.96	5830.0	0.00846	0.0413	3.41	0.00169	1.30541	1.98
215.0	35.16	70.5	5.46	4130.0	0.0105	0.0386	3.00	0.00149	1.29025	2.07
220.0	33.09	61.1	4.88	2550.0	0.0144	0.0359	2.57	0.00124	1.27173	2.27
225.0	30.09	49.0	4.15	1100.0	0.0263	0.0335	2.07	0.000864	1.24533	2.87
230.0	18.96	30.1	2.65	46.5	0.280	0.0328	1.08	0.000205	1.15026	10.0
235.0	11.59	32.2	2.53	171.0	0.0412	0.0173	0.841	0.00112	1.09006	2.33
240.0	9.939	35.2	2.53	240.0	0.0239	0.0147	0.812	0.00176	1.07690	1.67
245.0	8.980	37.8	2.53	285.0	0.0175	0.0135	0.802	0.00227	1.06930	1.41
250.0	8.303	40.2	2.52	318.0	0.0141	0.0128	0.798	0.00272	1.06396	1.27
255.0	7.782	42.4	2.52	343.0	0.0120	0.0123	0.798	0.00313	1.05986	1.18
260.0	7.359	44.5	2.51	363.0	0.0105	0.0120	0.800	0.00350	1.05654	1.12
265.0	7.004	46.6	2.50	380.0	0.00936	0.0118	0.804	0.00387	1.05376	1.07
270.0	6.699	48.6	2.50	394.0	0.00850	0.0117	0.809	0.00422	1.05138	1.03
275.0	6.431	50.5	2.49	406.0	0.00781	0.0116	0.815	0.00456	1.04929	1.00
280.0	6.194	52.4	2.49	417.0	0.00725	0.0115	0.821	0.00490	1.04744	0.975
285.0	5.981	54.2	2.48	426.0	0.00677	0.0115	0.828	0.00523	1.04578	0.953
290.0	5.788	56.0	2.48	434.0	0.00637	0.0115	0.836	0.00557	1.04428	0.934
295.0	5.611	57.7	2.47	442.0	0.00602	0.0115	0.843	0.00590	1.04291	0.917
300.0	5.449	59.5	2.46	448.0	0.00571	0.0115	0.851	0.00623	1.04165	0.903
310.0	5.160	62.9	2.45	459.0	0.00520	0.0116	0.867	0.00689	1.03941	0.878
320.0	4.909	66.2	2.44	469.0	0.00479	0.0118	0.884	0.00755	1.03747	0.858
330.0	4.687	69.5	2.43	477.0	0.00445	0.0119	0.901	0.00822	1.03575	0.842
340.0	4.490	72.7	2.42	483.0	0.00417	0.0121	0.918	0.00889	1.03423	0.828
350.0	4.312	75.8	2.41	489.0	0.00392	0.0123	0.936	0.00956	1.03285	0.817
360.0	4.150	78.9	2.41	494.0	0.00371	0.0125	0.953	0.0102	1.03161	0.807
370.0	4.003	82.0	2.40	498.0	0.00353	0.0126	0.971	0.0109	1.03048	0.799
380.0	3.867	85.0	2.39	502.0	0.00336	0.0128	0.989	0.0116	1.02943	0.792
390.0	3.743	88.0	2.38	506.0	0.00321	0.0130	1.01	0.0123	1.02847	0.786
400.0	3.627	91.0	2.38	509.0	0.00308	0.0132	1.02	0.0130	1.02758	0.781
410.0	3.519	94.0	2.37	511.0	0.00296	0.0134	1.04	0.0137	1.02675	0.776
420.0	3.418	96.9	2.36	514.0	0.00285	0.0136	1.06	0.0145	1.02598	0.772
430.0	3.324	100.0	2.36	516.0	0.00275	0.0138	1.08	0.0152	1.02526	0.768
440.0	3.235	103.0	2.35	518.0	0.00265	0.0140	1.09	0.0159	1.02458	0.765
450.0	3.152	106.0	2.35	519.0	0.00257	0.0142	1.11	0.0167	1.02394	0.762
460.0	3.073	108.0	2.34	521.0	0.00249	0.0144	1.13	0.0174	1.02334	0.759
470.0	2.999	111.0	2.33	523.0	0.00241	0.0147	1.15	0.0182	1.02277	0.756
480.0	2.928	114.0	2.33	524.0	0.00234	0.0149	1.16	0.0190	1.02223	0.754
490.0	2.861	117.0	2.33	525.0	0.00228	0.0151	1.18	0.0197	1.02172	0.752
500.0	2.798	120.0	2.32	526.0	0.00222	0.0153	1.20	0.0205	1.02123	0.750
510.0	2.737	122.0	2.32	527.0	0.00216	0.0155	1.21	0.0213	1.02077	0.748
520.0	2.679	125.0	2.31	528.0	0.00211	0.0157	1.23	0.0222	1.02032	0.746
530.0	2.624	128.0	2.31	529.0	0.00206	0.0159	1.25	0.0230	1.01990	0.745
540.0	2.571	131.0	2.31	530.0	0.00201	0.0161	1.26	0.0238	1.01950	0.743
550.0	2.521	133.0	2.30	530.0	0.00196	0.0163	1.28	0.0246	1.01911	0.742
560.0	2.472	136.0	2.30	531.0	0.00192	0.0165	1.30	0.0255	1.01874	0.741
570.0	2.426	139.0	2.29	532.0	0.00188	0.0167	1.31	0.0263	1.01839	0.739
580.0	2.381	142.0	2.29	532.0	0.00184	0.0169	1.33	0.0272	1.01805	0.738
590.0	2.338	144.0	2.29	533.0	0.00180	0.0171	1.34	0.0281	1.01772	0.737
600.0	2.297	147.0	2.28	533.0	0.00176	0.0173	1.36	0.0290	1.01741	0.736
700.0	1.956	174.0	2.25	536.0	0.00147	0.0192	1.51	0.0382	1.01480	0.728
800.0	1.706	201.0	2.22	538.0	0.00127	0.0211	1.66	0.0483	1.01290	0.723
900.0	1.514	229.0	2.19	538.0	0.00112	0.0230	1.79	0.0592	1.01145	0.720
1000.0	1.362	257.0	2.15	539.0	0.00100	0.0248	1.92	0.0708	1.01029	0.717
1500.0	0.9095	410.0	1.96	538.0	0.000661					
2000.0	0.6838	573.0	1.83	536.0	0.000496					
2500.0	0.5481	741.0	1.74	535.0	0.000397					
3000.0	0.4575	908.0	1.68	534.0	0.000331					
3500.0	0.3925	1080.0	1.65	534.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

540 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01864	1740.0	223.0	-62.22	-60.36	0.6014	0.2540	0.4739	3877.0
125.0	0.01887	1520.0	203.0	-59.66	-57.37	0.6208	0.2555	0.4788	3631.0
130.0	0.01912	1340.0	186.0	-57.48	-55.57	0.6396	0.2537	0.4810	3429.0
135.0	0.01933	1190.0	171.0	-55.10	-53.16	0.6578	0.2504	0.4820	3256.0
140.0	0.01965	1060.0	158.0	-52.72	-50.75	0.6754	0.2466	0.4627	3104.0
145.0	0.01995	953.0	146.0	-50.33	-48.34	0.6923	0.2428	0.4836	2965.0
150.0	0.02027	857.0	136.0	-47.94	-45.91	0.7087	0.2394	0.4852	2836.0
155.0	0.02061	771.0	126.0	-45.54	-43.48	0.7247	0.2364	0.4876	2714.0
160.0	0.02095	694.0	117.0	-43.13	-41.04	0.7402	0.2339	0.4911	2598.0
165.0	0.02135	623.0	109.0	-40.70	-38.57	0.7554	0.2317	0.4958	2484.0
170.0	0.02175	557.0	101.0	-38.25	-36.08	0.7703	0.2300	0.5019	2374.0
175.0	0.02221	497.0	93.5	-35.77	-33.55	0.7849	0.2285	0.5095	2265.0
180.0	0.02269	440.0	86.5	-33.25	-30.98	0.7994	0.2273	0.5190	2158.0
185.0	0.02322	387.0	79.8	-30.68	-28.35	0.8138	0.2263	0.5305	2050.0
190.0	0.02381	337.0	73.5	-28.05	-25.67	0.8281	0.2255	0.5448	1942.0
200.0	0.02523	245.0	61.3	-22.55	-20.03	0.8570	0.2245	0.5858	1721.0
205.0	0.02606	202.0	55.5	-19.64	-17.03	0.8718	0.2244	0.6169	1605.0
210.0	0.02703	161.0	49.6	-16.55	-13.84	0.8872	0.2246	0.6614	1480.0
215.0	0.02837	120.0	43.6	-13.21	-10.37	0.9035	0.2254	0.7317	1344.0
220.0	0.03011	80.1	37.2	-9.446	-6.435	0.9217	0.2273	0.8632	1188.0
225.0	0.03294	40.1	29.6	-4.708	-1.414	0.9442	0.2317	1.220	989.5
230.0	0.04461	3.83	16.3	5.918	10.38	0.996	0.2524	6.166	658.5
235.0	0.08113	12.8	7.60	20.65	28.77	1.075	0.2425	1.541	613.0
240.0	0.09645	22.6	6.05	24.85	34.50	1.099	0.2298	0.9006	639.9
245.0	0.1075	30.4	5.22	27.66	38.41	1.116	0.2214	0.6919	663.0
250.0	0.1167	37.1	4.67	29.91	41.58	1.128	0.2153	0.5856	683.4
255.0	0.1248	43.0	4.26	31.85	44.33	1.139	0.2105	0.5204	701.7
260.0	0.1322	48.4	3.93	33.59	46.82	1.149	0.2066	0.4759	718.6
265.0	0.1391	53.4	3.67	35.20	49.11	1.158	0.2034	0.4436	734.2
270.0	0.1456	58.0	3.46	36.71	51.26	1.166	0.2008	0.4189	748.9
275.0	0.1517	62.4	3.27	38.14	53.31	1.173	0.1985	0.3994	762.8
280.0	0.1576	66.6	3.11	39.50	55.26	1.180	0.1966	0.3837	776.1
285.0	0.1633	70.6	2.97	40.82	57.15	1.187	0.1949	0.3707	788.7
290.0	0.1689	74.4	2.84	42.09	58.97	1.193	0.1934	0.3597	800.8
295.0	0.1742	78.1	2.73	43.33	60.75	1.199	0.1921	0.3504	812.5
300.0	0.1795	81.7	2.63	44.53	62.48	1.205	0.1910	0.3424	823.7
310.0	0.1897	88.5	2.45	46.87	65.84	1.216	0.1891	0.3293	845.2
320.0	0.1994	95.0	2.30	49.13	69.08	1.226	0.1876	0.3191	865.5
330.0	0.2089	101.0	2.17	51.33	72.23	1.236	0.1864	0.3109	884.8
340.0	0.2182	107.0	2.06	53.48	75.30	1.245	0.1854	0.3043	903.3
350.0	0.2273	113.0	1.96	55.59	78.32	1.254	0.1845	0.2987	921.0
360.0	0.2362	119.0	1.88	57.66	81.28	1.262	0.1838	0.2940	938.0
370.0	0.2449	124.0	1.80	59.71	84.20	1.270	0.1832	0.2900	954.5
380.0	0.2535	130.0	1.73	61.73	87.08	1.278	0.1827	0.2865	970.5
390.0	0.2620	135.0	1.66	63.73	89.93	1.286	0.1822	0.2835	986.0
400.0	0.2704	140.0	1.60	65.71	92.75	1.293	0.1819	0.2809	1001.0
410.0	0.2787	145.0	1.55	67.68	95.55	1.300	0.1815	0.2786	1016.0
420.0	0.2870	150.0	1.49	69.63	98.32	1.306	0.1812	0.2765	1030.0
430.0	0.2951	155.0	1.45	71.57	101.1	1.313	0.1810	0.2747	1044.0
440.0	0.3032	160.0	1.40	73.50	103.8	1.319	0.1807	0.2730	1058.0
450.0	0.3113	165.0	1.36	75.42	106.5	1.325	0.1805	0.2715	1071.0
460.0	0.3193	169.0	1.32	77.32	109.2	1.331	0.1804	0.2702	1084.0
470.0	0.3272	174.0	1.29	79.23	111.9	1.337	0.1802	0.2689	1097.0
480.0	0.3351	179.0	1.25	81.12	114.6	1.343	0.1801	0.2678	1110.0
490.0	0.3429	183.0	1.22	83.01	117.3	1.348	0.1799	0.2668	1123.0
500.0	0.3508	188.0	1.19	84.89	120.0	1.353	0.1798	0.2658	1135.0
510.0	0.3585	193.0	1.16	86.77	122.6	1.359	0.1797	0.2650	1147.0
520.0	0.3663	197.0	1.14	88.64	125.3	1.364	0.1796	0.2642	1159.0
530.0	0.3740	202.0	1.11	90.50	127.9	1.369	0.1795	0.2634	1171.0
540.0	0.3817	206.0	1.09	92.37	130.5	1.374	0.1795	0.2628	1182.0
550.0	0.3893	210.0	1.06	94.22	133.2	1.379	0.1794	0.2621	1194.0
560.0	0.3970	215.0	1.04	96.08	135.8	1.383	0.1794	0.2616	1205.0
570.0	0.4046	219.0	1.02	97.93	138.4	1.388	0.1793	0.2610	1216.0
580.0	0.4122	224.0	1.00	99.8	141.0	1.392	0.1793	0.2605	1227.0
590.0	0.4198	228.0	0.978	101.6	143.6	1.397	0.1793	0.2601	1238.0
600.0	0.4273	232.0	0.959	103.5	146.2	1.401	0.1792	0.2596	1248.0
700.0	0.5020	274.0	0.806	121.8	172.0	1.441	0.1795	0.2568	1349.0
800.0	0.5756	316.0	0.697	140.1	197.6	1.475	0.1804	0.2560	1440.0
900.0	0.6485	356.0	0.615	158.4	223.2	1.505	0.1820	0.2564	1524.0
1000.0	0.7209	396.0	0.550	176.9	249.9	1.533	0.1842	0.2578	1602.0
1500.0	1.079	591.0	0.362	272.9	380.9	1.639	0.1991	0.2709	1931.0
2000.0	1.436	784.0	0.271	376.2	519.8	1.719	0.2128	0.2841	2203.0
2500.0	1.791	977.0	0.216	485.3	664.4	1.784	0.2226	0.2937	2443.0
3000.0	2.146	1170.0	0.180	598.4	813.0	1.838	0.2294	0.3004	2662.0
3500.0	2.501	1360.0	0.154	714.4	964.4	1.885	0.2341	0.3051	2865.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

540 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.55	199.0	16.3	33300.0	0.00233	0.0924	18.0	0.00363	1.46189	3.33
125.0	53.00	190.0	15.0	80500.0	0.00252	0.0894	15.6	0.00352	1.45562	3.01
130.0	52.31	181.0	14.0	70000.0	0.00266	0.0864	13.8	0.00343	1.44910	2.77
135.0	51.61	173.0	13.3	61300.0	0.00273	0.0834	12.6	0.00335	1.44235	2.61
140.0	50.87	165.0	12.6	54000.0	0.00293	0.0804	11.5	0.00327	1.43537	2.50
145.0	50.12	158.0	12.0	47700.0	0.00307	0.0774	10.5	0.00319	1.42818	2.37
150.0	49.34	151.0	11.5	42300.0	0.00321	0.0745	9.67	0.00311	1.42078	2.27
155.0	48.53	145.0	11.0	37400.0	0.00337	0.0716	8.96	0.00302	1.41318	2.20
160.0	47.70	139.0	10.5	33100.0	0.00354	0.0687	8.30	0.00293	1.40536	2.13
165.0	46.84	133.0	10.0	29200.0	0.00373	0.0659	7.68	0.00284	1.39730	2.08
170.0	45.95	127.0	9.54	25600.0	0.00394	0.0631	7.10	0.00274	1.38899	2.03
175.0	45.03	122.0	9.08	22400.0	0.00418	0.0604	6.55	0.00263	1.38038	1.99
180.0	44.07	116.0	8.63	19400.0	0.00446	0.0577	6.04	0.00252	1.37145	1.96
185.0	43.06	111.0	8.19	16700.0	0.00479	0.0550	5.55	0.00241	1.36213	1.93
190.0	42.00	105.0	7.76	14200.0	0.00519	0.0523	5.10	0.00228	1.35235	1.91
200.0	39.68	92.9	6.89	9720.0	0.00631	0.0469	4.24	0.00202	1.33101	1.91
205.0	38.37	86.3	6.44	7760.0	0.00715	0.0442	3.83	0.00187	1.31911	1.93
210.0	36.91	79.1	5.98	5930.0	0.00836	0.0414	3.43	0.00170	1.30598	1.97
215.0	35.25	71.1	5.48	4240.0	0.0103	0.0387	3.02	0.00150	1.29100	2.06
220.0	33.21	61.9	4.92	2660.0	0.0140	0.0361	2.60	0.00126	1.27286	2.24
225.0	30.35	50.2	4.21	1220.0	0.0243	0.0337	2.11	0.000310	1.24761	2.75
230.0	22.41	32.4	2.39	85.9	0.190	0.0334	1.20	0.000242	1.17923	8.49
235.0	12.32	31.9	2.54	157.0	0.0484	0.0184	0.861	0.000970	1.09591	2.59
240.0	10.37	34.8	2.54	234.0	0.0259	0.0152	0.823	0.00163	1.08031	1.75
245.0	9.302	37.4	2.53	282.0	0.0185	0.0139	0.809	0.00215	1.07185	1.45
250.0	8.569	39.9	2.53	317.0	0.0147	0.0131	0.804	0.00260	1.06606	1.30
255.0	8.012	42.1	2.52	344.0	0.0124	0.0125	0.803	0.00301	1.06167	1.20
260.0	7.564	44.3	2.52	366.0	0.0108	0.0122	0.805	0.00339	1.05815	1.13
265.0	7.190	46.3	2.51	384.0	0.00953	0.0119	0.808	0.00375	1.05522	1.08
270.0	6.870	48.3	2.51	399.0	0.00867	0.0116	0.813	0.00409	1.05272	1.04
275.0	6.591	50.2	2.50	411.0	0.00795	0.0117	0.818	0.00443	1.05053	1.01
280.0	6.343	52.1	2.49	422.0	0.00736	0.0116	0.825	0.00477	1.04861	0.982
285.0	6.122	54.0	2.49	432.0	0.00687	0.0116	0.831	0.00510	1.04688	0.959
290.0	5.922	55.8	2.48	441.0	0.00645	0.0116	0.838	0.00543	1.04532	0.939
295.0	5.739	57.5	2.48	448.0	0.00609	0.0116	0.846	0.00575	1.04390	0.922
300.0	5.571	59.3	2.47	455.0	0.00578	0.0116	0.853	0.00608	1.04260	0.907
310.0	5.273	62.7	2.46	467.0	0.00525	0.0117	0.869	0.00673	1.04028	0.882
320.0	5.014	66.0	2.45	477.0	0.00483	0.0118	0.886	0.00739	1.03828	0.861
330.0	4.786	69.3	2.44	485.0	0.00444	0.0120	0.903	0.00804	1.03651	0.844
340.0	4.583	72.5	2.43	492.0	0.00420	0.0121	0.920	0.00870	1.03495	0.830
350.0	4.400	75.7	2.42	498.0	0.00395	0.0123	0.937	0.00937	1.03354	0.819
360.0	4.234	78.8	2.41	503.0	0.00373	0.0125	0.955	0.0100	1.03226	0.809
370.0	4.083	81.9	2.40	507.0	0.00354	0.0127	0.973	0.0107	1.03109	0.801
380.0	3.945	84.9	2.39	511.0	0.00337	0.0129	0.990	0.0114	1.03003	0.793
390.0	3.817	87.9	2.39	515.0	0.00322	0.0131	1.01	0.0121	1.02904	0.787
400.0	3.698	90.9	2.38	518.0	0.00309	0.0133	1.03	0.0128	1.02813	0.782
410.0	3.588	93.9	2.37	521.0	0.00297	0.0135	1.04	0.0135	1.02728	0.777
420.0	3.485	96.8	2.37	523.0	0.00286	0.0137	1.06	0.0142	1.02649	0.773
430.0	3.388	100.0	2.36	525.0	0.00275	0.0139	1.08	0.0149	1.02575	0.769
440.0	3.298	103.0	2.35	527.0	0.00266	0.0141	1.10	0.0156	1.02506	0.765
450.0	3.213	105.0	2.35	529.0	0.00257	0.0143	1.11	0.0164	1.02441	0.762
460.0	3.132	108.0	2.34	531.0	0.00249	0.0145	1.13	0.0171	1.02379	0.759
470.0	3.056	111.0	2.34	532.0	0.00242	0.0147	1.15	0.0179	1.02321	0.757
480.0	2.984	114.0	2.33	534.0	0.00235	0.0149	1.16	0.0186	1.02266	0.755
490.0	2.916	117.0	2.33	535.0	0.00228	0.0151	1.18	0.0194	1.02213	0.752
500.0	2.851	120.0	2.32	536.0	0.00222	0.0153	1.20	0.0202	1.02164	0.750
510.0	2.789	122.0	2.32	537.0	0.00217	0.0155	1.22	0.0210	1.02116	0.749
520.0	2.730	125.0	2.32	538.0	0.00211	0.0157	1.23	0.0217	1.02071	0.747
530.0	2.674	128.0	2.31	539.0	0.00206	0.0159	1.25	0.0226	1.02028	0.745
540.0	2.620	131.0	2.31	540.0	0.00201	0.0161	1.26	0.0234	1.01987	0.744
550.0	2.568	133.0	2.30	540.0	0.00196	0.0163	1.28	0.0242	1.01948	0.742
560.0	2.519	136.0	2.30	541.0	0.00192	0.0165	1.30	0.0250	1.01910	0.741
570.0	2.472	139.0	2.30	542.0	0.00188	0.0167	1.31	0.0259	1.01874	0.740
580.0	2.426	142.0	2.29	542.0	0.00184	0.0169	1.33	0.0267	1.01839	0.739
590.0	2.382	144.0	2.29	543.0	0.00180	0.0171	1.35	0.0276	1.01806	0.737
600.0	2.340	147.0	2.29	543.0	0.00177	0.0173	1.36	0.0284	1.01773	0.736
700.0	1.992	174.0	2.26	547.0	0.00147	0.0192	1.51	0.0375	1.01508	0.728
800.0	1.737	201.0	2.22	548.0	0.00127	0.0211	1.66	0.0475	1.01314	0.723
900.0	1.542	229.0	2.19	549.0	0.00112	0.0230	1.79	0.0581	1.01166	0.720
1000.0	1.387	257.0	2.15	549.0	0.00100	0.0248	1.92	0.0695	1.01048	0.717
1500.0	0.9264	410.0	1.96	548.0	0.000661					
2000.0	0.6966	573.0	1.83	546.0	0.000495					
2500.0	0.5584	741.0	1.74	545.0	0.000397					
3000.0	0.4660	908.0	1.68	544.0	0.000331					
3500.0	0.3999	1080.0	1.65	544.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

550 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01864	1740.0	222.0	-62.23	-60.33	0.6013	0.2542	0.4737	3876.0
125.0	0.01887	1520.0	203.0	-59.87	-57.95	0.6207	0.2557	0.4786	3631.0
130.0	0.01911	1340.0	186.0	-57.50	-55.55	0.6395	0.2539	0.4809	3429.0
135.0	0.01937	1190.0	171.0	-55.11	-53.14	0.6577	0.2506	0.4819	3257.0
140.0	0.01965	1060.0	158.0	-52.73	-50.73	0.6753	0.2467	0.4825	3105.0
145.0	0.01995	954.0	147.0	-50.35	-48.32	0.6922	0.2430	0.4834	2966.0
150.0	0.02025	858.0	136.0	-47.96	-45.90	0.7086	0.2396	0.4850	2838.0
155.0	0.02060	773.0	126.0	-45.56	-43.46	0.7246	0.2366	0.4874	2716.0
160.0	0.02095	695.0	117.0	-43.15	-41.02	0.7401	0.2340	0.4908	2600.0
165.0	0.02134	625.0	109.0	-40.73	-38.55	0.7552	0.2318	0.4955	2487.0
170.0	0.02175	559.0	101.0	-38.28	-36.06	0.7701	0.2301	0.5015	2376.0
175.0	0.02220	499.0	93.6	-35.80	-33.54	0.7848	0.2286	0.5090	2268.0
180.0	0.02268	442.0	86.6	-33.28	-30.97	0.7992	0.2274	0.5184	2161.0
185.0	0.02321	389.0	80.0	-30.71	-28.35	0.8136	0.2264	0.5298	2054.0
190.0	0.02379	339.0	73.6	-28.09	-25.67	0.8279	0.2256	0.5439	1946.0
200.0	0.02518	247.0	61.5	-22.61	-20.04	0.8567	0.2246	0.5841	1726.0
205.0	0.02603	204.0	55.7	-19.70	-17.05	0.8715	0.2244	0.6144	1610.0
210.0	0.02704	163.0	49.8	-16.63	-13.88	0.8868	0.2246	0.6576	1487.0
215.0	0.02830	123.0	43.9	-13.32	-10.44	0.9030	0.2253	0.7250	1353.0
220.0	0.03000	83.1	37.5	-9.603	-6.548	0.9209	0.2271	0.8483	1199.0
225.0	0.03269	43.6	30.2	-5.002	-1.673	0.9428	0.2311	1.162	1008.0
230.0	0.04104	6.87	18.8	3.617	7.797	0.9843	0.2468	3.919	710.9
235.0	0.07595	10.9	8.27	19.38	27.11	1.068	0.2455	1.824	611.6
240.0	0.09235	21.0	6.39	24.13	33.54	1.095	0.2318	0.9716	637.9
245.0	0.1037	29.0	5.46	27.13	37.69	1.112	0.2229	0.7254	661.3
250.0	0.1131	35.8	4.86	29.48	40.99	1.125	0.2164	0.6058	681.9
255.0	0.1213	41.9	4.41	31.48	43.83	1.136	0.2114	0.5342	700.4
260.0	0.1287	47.4	4.07	33.27	46.37	1.146	0.2074	0.4861	717.5
265.0	0.1355	52.5	3.79	34.91	48.71	1.155	0.2041	0.4514	733.3
270.0	0.1420	57.2	3.56	36.44	50.90	1.163	0.2013	0.4252	748.1
275.0	0.1481	61.7	3.37	37.89	52.97	1.171	0.1990	0.4046	762.1
280.0	0.1540	65.9	3.20	39.27	54.95	1.178	0.1970	0.3881	775.4
285.0	0.1596	69.9	3.05	40.60	56.86	1.185	0.1953	0.3744	788.1
290.0	0.1651	73.8	2.92	41.89	58.70	1.191	0.1938	0.3630	800.3
295.0	0.1704	77.5	2.80	43.13	60.49	1.197	0.1925	0.3533	812.1
300.0	0.1756	81.1	2.70	44.35	62.24	1.203	0.1913	0.3450	823.4
310.0	0.1857	88.0	2.51	46.71	65.62	1.214	0.1894	0.3314	845.0
320.0	0.1953	94.6	2.36	48.98	68.88	1.225	0.1878	0.3209	865.4
330.0	0.2047	101.0	2.23	51.19	72.04	1.234	0.1865	0.3124	884.8
340.0	0.2139	107.0	2.11	53.35	75.13	1.244	0.1855	0.3055	903.3
350.0	0.2228	113.0	2.01	55.46	78.15	1.252	0.1846	0.2998	921.1
360.0	0.2315	118.0	1.92	57.55	81.13	1.261	0.1839	0.2950	938.2
370.0	0.2402	124.0	1.84	59.60	84.06	1.269	0.1833	0.2909	954.7
380.0	0.2486	129.0	1.76	61.62	86.95	1.277	0.1828	0.2873	970.7
390.0	0.2570	135.0	1.70	63.63	89.80	1.284	0.1823	0.2843	986.3
400.0	0.2653	140.0	1.63	65.61	92.63	1.291	0.1819	0.2816	1001.0
410.0	0.2735	145.0	1.58	67.58	95.44	1.298	0.1816	0.2792	1016.0
420.0	0.2816	150.0	1.53	69.54	98.22	1.305	0.1813	0.2771	1030.0
430.0	0.2896	155.0	1.48	71.48	101.0	1.311	0.1810	0.2752	1045.0
440.0	0.2976	160.0	1.43	73.41	103.7	1.318	0.1808	0.2735	1058.0
450.0	0.3055	165.0	1.39	75.34	106.4	1.324	0.1806	0.2720	1072.0
460.0	0.3133	169.0	1.35	77.25	109.2	1.330	0.1804	0.2706	1085.0
470.0	0.3212	174.0	1.31	79.15	111.9	1.335	0.1803	0.2693	1098.0
480.0	0.3289	179.0	1.28	81.05	114.5	1.341	0.1801	0.2682	1111.0
490.0	0.3366	183.0	1.25	82.94	117.2	1.347	0.1800	0.2671	1123.0
500.0	0.3443	188.0	1.22	84.82	119.9	1.352	0.1799	0.2662	1135.0
510.0	0.3520	193.0	1.19	86.70	122.5	1.357	0.1798	0.2653	1147.0
520.0	0.3596	197.0	1.16	88.57	125.2	1.362	0.1797	0.2645	1159.0
530.0	0.3672	202.0	1.13	90.44	127.8	1.367	0.1796	0.2637	1171.0
540.0	0.3747	206.0	1.11	92.30	130.5	1.372	0.1795	0.2630	1183.0
550.0	0.3823	210.0	1.08	94.16	133.1	1.377	0.1795	0.2624	1194.0
560.0	0.3898	215.0	1.06	96.02	135.7	1.382	0.1794	0.2618	1205.0
570.0	0.3973	219.0	1.04	97.87	138.3	1.387	0.1794	0.2613	1216.0
580.0	0.4047	224.0	1.02	99.7	140.9	1.391	0.1793	0.2607	1227.0
590.0	0.4122	228.0	1.00	101.6	143.5	1.396	0.1793	0.2603	1238.0
600.0	0.4196	232.0	0.978	103.4	146.2	1.400	0.1793	0.2598	1249.0
700.0	0.4930	275.0	0.822	121.8	172.0	1.440	0.1795	0.2570	1350.0
800.0	0.5653	316.0	0.710	140.0	197.6	1.474	0.1804	0.2561	1441.0
900.0	0.6369	356.0	0.626	158.4	223.2	1.504	0.1820	0.2565	1525.0
1000.0	0.7080	396.0	0.560	176.8	248.9	1.531	0.1842	0.2578	1603.0
1500.0	1.060	592.0	0.369	272.9	380.9	1.638	0.1991	0.2709	1932.0
2000.0	1.410	785.0	0.276	376.2	519.8	1.718	0.2128	0.2841	2203.0
2500.0	1.759	977.0	0.220	485.3	664.4	1.782	0.2226	0.2937	2444.0
3000.0	2.107	1170.0	0.183	598.4	813.0	1.837	0.2294	0.3004	2663.0
3500.0	2.455	1360.0	0.157	714.4	964.5	1.883	0.2341	0.3051	2866.0

* TWO-PHASE BOUNDARY

550 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DU)$_V$ PSIA-CU FT/BTU	-V(DP/DV)$_T$ PSIA	(DV/DT)$_P$/V 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.65	199.0	16.3	93400.0	0.00233	0.0924	18.1	0.00364	1.46195	3.33
125.0	53.00	190.0	15.0	80600.0	0.00252	0.0894	15.6	0.00352	1.45568	3.01
130.0	52.32	181.0	14.0	70100.0	0.00265	0.0864	13.8	0.00343	1.44917	2.77
135.0	51.61	173.0	13.2	61400.0	0.00273	0.0834	12.6	0.00335	1.44243	2.61
140.0	50.88	165.0	12.6	54100.0	0.00292	0.0804	11.6	0.00327	1.43546	2.50
145.0	50.13	158.0	12.0	47800.0	0.00306	0.0774	10.5	0.00320	1.42828	2.37
150.0	49.35	151.0	11.5	42400.0	0.00321	0.0745	9.68	0.00311	1.42089	2.27
155.0	48.54	145.0	11.0	37500.0	0.00336	0.0716	8.97	0.00303	1.41330	2.20
160.0	47.71	139.0	10.5	33200.0	0.00353	0.0685	8.31	0.00294	1.40549	2.13
165.0	46.86	133.0	10.0	29300.0	0.00372	0.0660	7.69	0.00284	1.39745	2.08
170.0	45.97	128.0	9.54	25700.0	0.00393	0.0632	7.11	0.00274	1.38916	2.03
175.0	45.05	122.0	9.03	22500.0	0.00417	0.0604	6.56	0.00264	1.38057	1.99
180.0	44.09	117.0	8.64	19500.0	0.00444	0.0577	6.05	0.00253	1.37166	1.96
185.0	43.09	111.0	8.20	16800.0	0.00477	0.0550	5.57	0.00241	1.36237	1.93
190.0	42.03	105.0	7.76	14300.0	0.00517	0.0524	5.11	0.00229	1.35262	1.91
200.0	39.72	93.2	6.90	9820.0	0.00627	0.0470	4.25	0.00203	1.33139	1.90
205.0	38.42	86.7	6.46	7850.0	0.00709	0.0443	3.84	0.00188	1.31956	1.92
210.0	36.98	79.6	6.00	6030.0	0.00826	0.0415	3.44	0.00171	1.30653	1.96
215.0	35.33	71.7	5.51	4340.0	0.0101	0.0388	3.04	0.00152	1.29174	2.04
220.0	33.34	62.6	4.96	2770.0	0.0135	0.0362	2.62	0.00128	1.27394	2.21
225.0	30.59	51.3	4.27	1330.0	0.0226	0.0336	2.15	0.000951	1.24971	2.66
230.0	24.37	35.0	3.12	167.0	0.112	0.0326	1.43	0.000341	1.19581	6.18
235.0	13.17	31.6	2.56	143.0	0.0578	0.0193	0.884	0.000824	1.10276	2.33
240.0	10.83	34.5	2.55	227.0	0.0292	0.0158	0.834	0.00151	1.08398	1.84
245.0	9.639	37.1	2.54	280.0	0.0195	0.0142	0.817	0.00204	1.07452	1.50
250.0	8.843	39.6	2.54	317.0	0.0153	0.0133	0.810	0.00249	1.06822	1.33
255.0	8.247	41.8	2.53	346.0	0.0128	0.0127	0.808	0.00289	1.06352	1.22
260.0	7.773	44.0	2.53	368.0	0.0110	0.0124	0.809	0.00327	1.05979	1.15
265.0	7.379	46.1	2.52	387.0	0.00980	0.0121	0.812	0.00363	1.05670	1.09
270.0	7.043	48.1	2.51	403.0	0.00885	0.0119	0.817	0.00397	1.05407	1.05
275.0	6.752	50.0	2.51	416.0	0.00809	0.0118	0.822	0.00431	1.05179	1.02
280.0	6.494	51.9	2.50	428.0	0.00743	0.0117	0.828	0.00464	1.04978	0.989
285.0	6.264	53.7	2.49	438.0	0.00697	0.0117	0.834	0.00497	1.04799	0.965
290.0	6.057	55.6	2.49	447.0	0.00653	0.0116	0.841	0.00529	1.04637	0.945
295.0	5.867	57.3	2.48	455.0	0.00616	0.0116	0.848	0.00562	1.04490	0.927
300.0	5.694	59.1	2.48	462.0	0.00584	0.0117	0.856	0.00594	1.04355	0.911
310.0	5.386	62.5	2.47	474.0	0.00530	0.0118	0.872	0.00658	1.04116	0.885
320.0	5.119	65.9	2.45	484.0	0.00487	0.0119	0.888	0.00723	1.03910	0.864
330.0	4.885	69.1	2.44	493.0	0.00452	0.0120	0.905	0.00788	1.03728	0.847
340.0	4.676	72.4	2.43	500.0	0.00422	0.0122	0.922	0.00853	1.03567	0.832
350.0	4.489	75.5	2.42	506.0	0.00397	0.0124	0.939	0.00918	1.03422	0.820
360.0	4.319	78.7	2.42	512.0	0.00375	0.0125	0.957	0.00984	1.03291	0.810
370.0	4.164	81.7	2.41	516.0	0.00356	0.0127	0.974	0.0105	1.03171	0.802
380.0	4.022	84.8	2.40	520.0	0.00339	0.0129	0.992	0.0112	1.03062	0.795
390.0	3.891	87.8	2.39	524.0	0.00324	0.0131	1.01	0.0119	1.02961	0.788
400.0	3.769	90.8	2.38	527.0	0.00310	0.0133	1.03	0.0125	1.02868	0.783
410.0	3.657	93.8	2.38	530.0	0.00298	0.0135	1.04	0.0132	1.02781	0.778
420.0	3.551	96.7	2.37	533.0	0.00287	0.0137	1.06	0.0139	1.02700	0.773
430.0	3.453	100.0	2.36	535.0	0.00276	0.0139	1.08	0.0146	1.02625	0.769
440.0	3.360	103.0	2.36	537.0	0.00267	0.0141	1.10	0.0153	1.02554	0.766
450.0	3.273	105.0	2.35	539.0	0.00259	0.0143	1.11	0.0161	1.02487	0.763
460.0	3.191	108.0	2.35	541.0	0.00250	0.0145	1.13	0.0168	1.02424	0.760
470.0	3.114	111.0	2.34	542.0	0.00242	0.0147	1.15	0.0175	1.02365	0.757
480.0	3.040	114.0	2.34	544.0	0.00235	0.0149	1.17	0.0183	1.02308	0.755
490.0	2.970	117.0	2.33	545.0	0.00229	0.0151	1.18	0.0190	1.02255	0.753
500.0	2.904	120.0	2.33	546.0	0.00223	0.0153	1.20	0.0198	1.02204	0.751
510.0	2.841	122.0	2.32	547.0	0.00217	0.0155	1.22	0.0206	1.02156	0.749
520.0	2.781	125.0	2.32	548.0	0.00211	0.0157	1.23	0.0214	1.02110	0.747
530.0	2.723	128.0	2.31	549.0	0.00205	0.0159	1.25	0.0221	1.02066	0.746
540.0	2.668	131.0	2.31	550.0	0.00201	0.0161	1.27	0.0229	1.02024	0.744
550.0	2.616	133.0	2.31	551.0	0.00197	0.0163	1.28	0.0238	1.01984	0.743
560.0	2.566	136.0	2.30	551.0	0.00192	0.0165	1.30	0.0246	1.01945	0.741
570.0	2.517	139.0	2.30	552.0	0.00188	0.0167	1.31	0.0254	1.01909	0.740
580.0	2.471	142.0	2.30	553.0	0.00184	0.0169	1.33	0.0262	1.01873	0.739
590.0	2.426	144.0	2.29	553.0	0.00180	0.0171	1.35	0.0271	1.01839	0.738
600.0	2.383	147.0	2.29	554.0	0.00177	0.0173	1.36	0.0279	1.01806	0.737
700.0	2.029	174.0	2.26	557.0	0.00148	0.0192	1.51	0.0369	1.01536	0.728
800.0	1.769	201.0	2.23	559.0	0.00127	0.0211	1.66	0.0466	1.01339	0.723
900.0	1.570	229.0	2.19	559.0	0.00112	0.0230	1.79	0.0571	1.01187	0.720
1000.0	1.412	257.0	2.15	559.0	0.00100	0.0249	1.92	0.0683	1.01068	0.717
1500.0	0.9433	410.0	1.97	556.0	0.000651					
2000.0	0.7093	574.0	1.83	557.0	0.000495					
2500.0	0.5686	741.0	1.74	556.0	0.000396					
3000.0	0.4746	908.0	1.68	555.0	0.000331					
3500.0	0.4073	1080.0	1.65	554.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

560 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01864	1740.0	222.0	-62.24	-60.31	0.6012	0.2545	0.4736	3876.0
125.0	0.01885	1520.0	203.0	-59.68	-57.92	0.6206	0.2559	0.4785	3631.0
130.0	0.01911	1340.0	186.0	-57.51	-55.53	0.6395	0.2541	0.4807	3429.0
135.0	0.01937	1190.0	171.0	-55.13	-53.12	0.6576	0.2507	0.4817	3257.0
140.0	0.01965	1070.0	158.0	-52.75	-50.71	0.6751	0.2469	0.4824	3105.0
145.0	0.01995	956.0	147.0	-50.36	-48.30	0.6921	0.2431	0.4832	2967.0
150.0	0.02025	860.0	136.0	-47.98	-45.88	0.7085	0.2397	0.4847	2839.0
155.0	0.02053	775.0	126.0	-45.58	-43.45	0.7244	0.2367	0.4871	2716.0
160.0	0.02095	697.0	117.0	-43.18	-41.00	0.7399	0.2341	0.4905	2602.0
165.0	0.02133	626.0	109.0	-40.75	-38.54	0.7551	0.2320	0.4951	2489.0
170.0	0.02174	561.0	101.0	-38.30	-36.05	0.7700	0.2302	0.5011	2379.0
175.0	0.02213	500.0	93.7	-35.83	-33.53	0.7846	0.2287	0.5086	2271.0
180.0	0.02267	444.0	86.7	-33.31	-30.96	0.7990	0.2274	0.5178	2164.0
185.0	0.02319	391.0	80.1	-30.75	-28.34	0.8134	0.2264	0.5290	2057.0
190.0	0.02377	341.0	73.8	-28.13	-25.67	0.8277	0.2256	0.5429	1950.0
200.0	0.02515	249.0	61.7	-22.66	-20.06	0.8564	0.2246	0.5824	1731.0
205.0	0.02600	207.0	55.9	-19.77	-17.07	0.8712	0.2244	0.6121	1616.0
210.0	0.02700	166.0	50.1	-16.71	-13.91	0.8864	0.2246	0.6539	1494.0
215.0	0.02824	125.0	44.1	-13.43	-10.50	0.9025	0.2253	0.7186	1361.0
220.0	0.02983	86.0	37.9	-9.755	-6.656	0.9202	0.2269	0.8345	1211.0
225.0	0.03245	47.0	30.8	-5.276	-1.910	0.9415	0.2306	1.114	1026.0
230.0	0.03913	10.4	20.5	2.236	6.296	0.9775	0.2431	2.865	754.1
235.0	0.07057	9.14	9.06	17.90	25.22	1.059	0.2484	2.194	611.7
240.0	0.08831	19.4	6.77	23.36	32.52	1.090	0.2338	1.054	636.2
245.0	0.1001	27.6	5.72	26.57	36.95	1.108	0.2244	0.7625	659.6
250.0	0.1096	34.7	5.06	29.03	40.39	1.122	0.2176	0.6275	680.5
255.0	0.1178	40.8	4.58	31.10	43.32	1.134	0.2124	0.5487	699.2
260.0	0.1252	46.4	4.21	32.94	45.92	1.144	0.2082	0.4967	716.4
265.0	0.1321	51.5	3.92	34.61	48.31	1.153	0.2048	0.4595	732.4
270.0	0.1385	56.4	3.67	36.17	50.53	1.161	0.2019	0.4317	747.3
275.0	0.1446	60.9	3.47	37.64	52.64	1.169	0.1995	0.4100	761.4
280.0	0.1504	65.2	3.29	39.04	54.64	1.176	0.1975	0.3926	774.8
285.0	0.1561	69.3	3.14	40.38	56.57	1.183	0.1957	0.3783	787.6
290.0	0.1615	73.2	3.00	41.68	58.43	1.189	0.1941	0.3664	799.9
295.0	0.1668	77.0	2.88	42.94	60.23	1.195	0.1928	0.3563	811.7
300.0	0.1719	80.6	2.77	44.17	61.99	1.201	0.1916	0.3476	823.1
310.0	0.1818	87.6	2.58	46.54	65.39	1.213	0.1896	0.3335	844.8
320.0	0.1914	94.2	2.42	48.83	68.67	1.223	0.1880	0.3226	865.3
330.0	0.2006	100.0	2.28	51.05	71.85	1.233	0.1867	0.3139	884.7
340.0	0.2097	107.0	2.16	53.22	74.96	1.242	0.1857	0.3068	903.3
350.0	0.2185	112.0	2.05	55.34	77.99	1.251	0.1848	0.3009	921.1
360.0	0.2271	118.0	1.96	57.43	80.98	1.259	0.1840	0.2960	938.3
370.0	0.2356	124.0	1.88	59.49	83.92	1.267	0.1834	0.2918	954.9
380.0	0.2440	129.0	1.80	61.52	86.81	1.275	0.1829	0.2881	970.9
390.0	0.2522	134.0	1.73	63.53	89.68	1.282	0.1824	0.2850	986.5
400.0	0.2603	140.0	1.67	65.52	92.52	1.290	0.1820	0.2822	1002.0
410.0	0.2684	145.0	1.61	67.49	95.33	1.297	0.1817	0.2798	1016.0
420.0	0.2764	150.0	1.56	69.45	98.11	1.303	0.1814	0.2776	1031.0
430.0	0.2843	155.0	1.51	71.40	100.9	1.310	0.1811	0.2757	1045.0
440.0	0.2921	160.0	1.46	73.33	103.6	1.316	0.1809	0.2740	1059.0
450.0	0.2999	165.0	1.42	75.26	106.4	1.322	0.1807	0.2724	1072.0
460.0	0.3077	169.0	1.38	77.17	109.1	1.328	0.1805	0.2710	1085.0
470.0	0.3153	174.0	1.34	79.08	111.8	1.334	0.1803	0.2697	1098.0
480.0	0.3230	179.0	1.31	80.98	114.5	1.340	0.1802	0.2685	1111.0
490.0	0.3306	183.0	1.27	82.87	117.1	1.345	0.1800	0.2675	1124.0
500.0	0.3381	188.0	1.24	84.75	119.8	1.351	0.1799	0.2665	1136.0
510.0	0.3457	193.0	1.21	86.63	122.5	1.356	0.1798	0.2656	1148.0
520.0	0.3532	197.0	1.18	88.51	125.1	1.361	0.1797	0.2648	1160.0
530.0	0.3606	202.0	1.15	90.38	127.8	1.366	0.1796	0.2640	1172.0
540.0	0.3680	206.0	1.13	92.24	130.4	1.371	0.1795	0.2633	1183.0
550.0	0.3755	211.0	1.10	94.11	133.0	1.376	0.1795	0.2626	1195.0
560.0	0.3828	215.0	1.08	95.96	135.7	1.381	0.1794	0.2620	1206.0
570.0	0.3902	219.0	1.06	97.82	138.3	1.385	0.1794	0.2615	1217.0
580.0	0.3975	224.0	1.04	99.7	140.9	1.390	0.1794	0.2610	1228.0
590.0	0.4049	228.0	1.02	101.5	143.5	1.394	0.1793	0.2605	1239.0
600.0	0.4121	232.0	1.00	103.4	146.1	1.399	0.1793	0.2600	1250.0
700.0	0.4843	275.0	0.837	121.7	171.9	1.438	0.1795	0.2571	1350.0
800.0	0.5553	316.0	0.724	140.0	197.6	1.473	0.1804	0.2562	1442.0
900.0	0.6257	356.0	0.638	158.3	223.2	1.503	0.1820	0.2565	1525.0
1000.0	0.6955	396.0	0.571	176.8	248.9	1.530	0.1842	0.2579	1603.0
1500.0	1.041	592.0	0.376	272.9	380.9	1.637	0.1991	0.2710	1932.0
2000.0	1.385	785.0	0.281	376.2	519.8	1.717	0.2128	0.2841	2204.0
2500.0	1.728	977.0	0.224	485.3	664.4	1.781	0.2226	0.2937	2444.0
3000.0	2.070	1170.0	0.187	598.4	813.1	1.835	0.2294	0.3004	2663.0
3500.0	2.412	1360.0	0.160	714.4	964.5	1.882	0.2342	0.3051	2866.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

500 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial V)_T$ PSIA-CU FT/BTU	$-V(\partial P/\partial T)_V$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.66	199.0	16.3	93500.0	0.00231	0.0924	18.1	0.00364	1.46200	3.34
125.0	53.01	190.0	14.9	80700.0	0.00251	0.0894	15.6	0.00353	1.45575	3.01
130.0	52.33	181.0	14.0	79200.0	0.00265	0.0864	13.9	0.00344	1.44924	2.78
135.0	51.62	173.0	13.2	61500.0	0.00275	0.0834	12.6	0.00336	1.44251	2.61
140.0	50.89	165.0	12.6	54200.0	0.00292	0.0804	11.6	0.00328	1.43555	2.50
145.0	50.14	158.0	12.0	47900.0	0.00306	0.0775	10.6	0.00320	1.42838	2.37
150.0	49.36	151.0	11.5	42500.0	0.00320	0.0746	9.69	0.00312	1.42100	2.27
155.0	48.56	145.0	11.0	37600.0	0.00335	0.0717	8.98	0.00303	1.41342	2.20
160.0	47.73	139.0	10.5	33300.0	0.00352	0.0688	8.32	0.00294	1.40563	2.13
165.0	46.87	134.0	10.0	29400.0	0.00371	0.0660	7.70	0.00284	1.39760	2.08
170.0	45.99	128.0	9.55	25800.0	0.00392	0.0632	7.12	0.00274	1.38932	2.03
175.0	45.07	122.0	9.09	22600.0	0.00415	0.0605	6.58	0.00264	1.38076	1.99
180.0	44.12	117.0	8.65	19600.0	0.00443	0.0578	6.06	0.00253	1.37187	1.96
185.0	43.11	111.0	8.21	16900.0	0.00475	0.0551	5.58	0.00242	1.36260	1.93
190.0	42.06	106.0	7.77	14300.0	0.00514	0.0524	5.12	0.00230	1.35289	1.91
200.0	39.76	93.6	6.91	9920.0	0.00622	0.0471	4.27	0.00203	1.33175	1.90
205.0	38.46	87.1	6.47	7950.0	0.00703	0.0444	3.86	0.00188	1.32000	1.92
210.0	37.04	80.1	6.02	6130.0	0.00817	0.0417	3.46	0.00172	1.30708	1.96
215.0	35.41	72.3	5.53	4440.0	0.00994	0.0390	3.06	0.00153	1.29246	2.03
220.0	33.45	63.4	4.99	2880.0	0.0132	0.0364	2.65	0.00130	1.27499	2.18
225.0	30.81	52.4	4.33	1450.0	0.0212	0.0340	2.18	0.000990	1.25165	2.58
230.0	25.54	37.3	3.29	266.0	0.0769	0.0322	1.53	0.000440	1.20588	4.91
235.0	14.17	31.4	2.57	130.0	0.0698	0.0214	0.913	0.000688	1.11089	3.37
240.0	11.32	34.2	2.56	219.0	0.0309	0.0165	0.846	0.00138	1.08794	1.95
245.0	9.99	36.8	2.55	276.0	0.0207	0.0146	0.825	0.00192	1.07732	1.55
250.0	9.127	39.3	2.55	316.0	0.0160	0.0136	0.817	0.00238	1.07047	1.36
255.0	8.489	41.5	2.54	347.0	0.0132	0.0130	0.814	0.00278	1.06543	1.24
260.0	7.986	43.7	2.53	371.0	0.0114	0.0125	0.814	0.00316	1.06146	1.16
265.0	7.571	45.8	2.53	391.0	0.0100	0.0122	0.817	0.00352	1.05821	1.10
270.0	7.220	47.8	2.52	407.0	0.00903	0.0120	0.820	0.00386	1.05545	1.06
275.0	6.915	49.8	2.51	421.0	0.00824	0.0119	0.825	0.00419	1.05307	1.03
280.0	6.647	51.7	2.51	433.0	0.00760	0.0118	0.831	0.00452	1.05097	1.00
285.0	6.408	53.5	2.50	444.0	0.00707	0.0117	0.837	0.00484	1.04911	0.971
290.0	6.193	55.3	2.50	453.0	0.00662	0.0117	0.844	0.00516	1.04743	0.950
295.0	5.997	57.1	2.49	461.0	0.00624	0.0117	0.851	0.00548	1.04591	0.932
300.0	5.818	58.9	2.48	469.0	0.00590	0.0117	0.858	0.00580	1.04451	0.916
310.0	5.500	62.3	2.47	482.0	0.00535	0.0118	0.874	0.00644	1.04205	0.889
320.0	5.225	65.7	2.46	492.0	0.00491	0.0119	0.890	0.00707	1.03992	0.867
330.0	4.984	69.0	2.45	501.0	0.00455	0.0121	0.907	0.00771	1.03805	0.849
340.0	4.770	72.2	2.44	508.0	0.00425	0.0122	0.924	0.00836	1.03639	0.834
350.0	4.577	75.4	2.43	515.0	0.00399	0.0124	0.941	0.00900	1.03490	0.822
360.0	4.403	78.5	2.42	520.0	0.00377	0.0126	0.958	0.00965	1.03356	0.812
370.0	4.245	81.6	2.41	525.0	0.00357	0.0128	0.976	0.0103	1.03234	0.803
380.0	4.099	84.7	2.40	529.0	0.00340	0.0129	0.993	0.0110	1.03122	0.796
390.0	3.965	87.7	2.40	533.0	0.00325	0.0131	1.01	0.0116	1.03018	0.789
400.0	3.841	90.7	2.39	536.0	0.00311	0.0133	1.03	0.0123	1.02923	0.784
410.0	3.726	93.7	2.38	539.0	0.00299	0.0135	1.05	0.0130	1.02834	0.779
420.0	3.618	96.6	2.37	542.0	0.00287	0.0137	1.06	0.0137	1.02752	0.774
430.0	3.517	100.0	2.37	545.0	0.00277	0.0139	1.08	0.0144	1.02674	0.770
440.0	3.423	102.0	2.36	547.0	0.00267	0.0141	1.10	0.0151	1.02602	0.767
450.0	3.334	105.0	2.36	549.0	0.00259	0.0143	1.12	0.0158	1.02534	0.763
460.0	3.250	108.0	2.35	550.0	0.00251	0.0145	1.13	0.0165	1.02469	0.761
470.0	3.171	111.0	2.35	552.0	0.00243	0.0147	1.15	0.0172	1.02409	0.758
480.0	3.096	114.0	2.34	553.0	0.00236	0.0149	1.17	0.0180	1.02351	0.755
490.0	3.025	117.0	2.34	555.0	0.00229	0.0151	1.18	0.0187	1.02297	0.753
500.0	2.957	119.0	2.33	556.0	0.00223	0.0153	1.20	0.0195	1.02245	0.751
510.0	2.893	122.0	2.33	557.0	0.00217	0.0155	1.22	0.0202	1.02196	0.749
520.0	2.832	125.0	2.32	558.0	0.00212	0.0157	1.23	0.0210	1.02149	0.748
530.0	2.773	128.0	2.32	559.0	0.00207	0.0159	1.25	0.0218	1.02104	0.746
540.0	2.717	131.0	2.31	560.0	0.00202	0.0161	1.27	0.0225	1.02061	0.744
550.0	2.663	133.0	2.31	561.0	0.00197	0.0163	1.28	0.0233	1.02020	0.743
560.0	2.612	136.0	2.31	561.0	0.00193	0.0165	1.30	0.0241	1.01981	0.742
570.0	2.563	139.0	2.30	562.0	0.00188	0.0167	1.32	0.0250	1.01943	0.740
580.0	2.516	142.0	2.30	563.0	0.00184	0.0169	1.33	0.0258	1.01907	0.739
590.0	2.470	144.0	2.30	563.0	0.00180	0.0171	1.35	0.0266	1.01873	0.738
600.0	2.426	147.0	2.29	564.0	0.00177	0.0173	1.36	0.0274	1.01839	0.737
700.0	2.065	174.0	2.26	567.0	0.00148	0.0192	1.51	0.0362	1.01564	0.729
800.0	1.801	201.0	2.23	569.0	0.00127	0.0211	1.66	0.0458	1.01363	0.723
900.0	1.598	229.0	2.19	570.0	0.00112	0.0230	1.79	0.0561	1.01209	0.720
1000.0	1.438	257.0	2.16	570.0	0.00100	0.0249	1.92	0.0671	1.01087	0.717
1500.0	0.9602	410.0	1.97	568.0	0.000661					
2000.0	0.7221	574.0	1.83	567.0	0.000495					
2500.0	0.5738	741.0	1.74	566.0	0.000396					
3000.0	0.4831	909.0	1.68	565.0	0.000331					
3500.0	0.4149	1080.0	1.65	564.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

570 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01863	1740.0	222.0	-62.25	-60.28	0.6011	0.2547	0.4735	3876.0
125.0	0.01886	1520.0	203.0	-59.89	-57.90	0.6205	0.2562	0.4783	3631.0
130.0	0.01911	1340.0	186.0	-57.52	-55.50	0.6394	0.2543	0.4806	3430.0
135.0	0.01937	1190.0	171.0	-55.14	-53.10	0.6575	0.2509	0.4815	3258.0
140.0	0.01965	1070.0	158.0	-52.76	-50.69	0.6750	0.2471	0.4822	3106.0
145.0	0.01994	958.0	147.0	-50.38	-48.27	0.6920	0.2433	0.4830	2969.0
150.0	0.02025	862.0	136.0	-47.99	-45.86	0.7084	0.2398	0.4845	2841.0
155.0	0.02059	776.0	126.0	-45.60	-43.43	0.7243	0.2368	0.4868	2719.0
160.0	0.02095	699.0	117.0	-43.20	-40.99	0.7398	0.2342	0.4902	2603.0
165.0	0.02133	628.0	109.0	-40.77	-38.52	0.7550	0.2321	0.4948	2491.0
170.0	0.02174	563.0	101.0	-38.33	-36.04	0.7698	0.2303	0.5007	2381.0
175.0	0.02218	502.0	93.8	-35.86	-33.51	0.7844	0.2288	0.5081	2274.0
180.0	0.02265	446.0	86.9	-33.34	-30.95	0.7989	0.2275	0.5172	2167.0
185.0	0.02318	393.0	80.3	-30.79	-28.34	0.8132	0.2265	0.5283	2061.0
190.0	0.02376	343.0	73.9	-28.17	-25.67	0.8274	0.2257	0.5420	1954.0
200.0	0.02513	252.0	61.9	-22.72	-20.07	0.8561	0.2246	0.5808	1736.0
205.0	0.02597	209.0	56.1	-19.83	-17.09	0.8708	0.2244	0.6097	1622.0
210.0	0.02695	168.0	50.3	-16.80	-13.95	0.8860	0.2246	0.6504	1501.0
215.0	0.02818	128.0	44.4	-13.53	-10.56	0.9020	0.2252	0.7125	1370.0
220.0	0.02979	88.9	38.2	-9.903	-6.758	0.9194	0.2267	0.8217	1222.0
225.0	0.03224	50.3	31.3	-5.531	-2.128	0.9402	0.2301	1.072	1042.0
230.0	0.03793	14.0	21.8	1.265	5.268	0.9727	0.2405	2.310	790.3
235.0	0.06510	7.76	10.0	16.21	23.08	1.049	0.2510	2.632	614.2
240.0	0.08431	17.8	7.19	22.54	31.44	1.085	0.2359	1.151	634.8
245.0	0.09650	26.3	5.99	26.00	35.18	1.104	0.2259	0.8034	658.1
250.0	0.1062	33.5	5.26	28.57	38.78	1.119	0.2188	0.6508	679.1
255.0	0.1145	39.8	4.75	30.72	42.80	1.131	0.2133	0.5641	698.1
260.0	0.1219	45.5	4.36	32.60	45.47	1.141	0.2090	0.5077	715.4
265.0	0.1288	50.7	4.04	34.31	47.90	1.150	0.2055	0.4680	731.5
270.0	0.1352	55.6	3.79	35.90	50.16	1.159	0.2025	0.4384	746.6
275.0	0.1412	60.1	3.57	37.39	52.30	1.167	0.2000	0.4155	760.8
280.0	0.1470	64.5	3.39	38.81	54.33	1.174	0.1979	0.3971	774.3
285.0	0.1526	68.6	3.22	40.17	56.27	1.181	0.1961	0.3822	787.2
290.0	0.1580	72.5	3.08	41.48	58.15	1.187	0.1945	0.3698	799.5
295.0	0.1632	76.4	2.95	42.75	59.97	1.194	0.1931	0.3592	811.4
300.0	0.1683	80.1	2.84	43.98	61.75	1.199	0.1919	0.3502	822.8
310.0	0.1781	87.1	2.64	46.37	65.17	1.211	0.1898	0.3357	844.6
320.0	0.1876	93.7	2.47	48.67	68.47	1.221	0.1882	0.3244	865.2
330.0	0.1967	100.0	2.33	50.91	71.67	1.231	0.1869	0.3154	884.7
340.0	0.2056	106.0	2.21	53.08	74.78	1.240	0.1858	0.3081	903.4
350.0	0.2143	112.0	2.10	55.21	77.83	1.249	0.1849	0.3020	921.3
360.0	0.2228	118.0	2.00	57.31	80.83	1.258	0.1842	0.2970	938.5
370.0	0.2312	123.0	1.92	59.37	83.78	1.266	0.1835	0.2926	955.1
380.0	0.2394	129.0	1.84	61.41	86.68	1.273	0.1830	0.2889	971.2
390.0	0.2476	134.0	1.77	63.43	89.56	1.281	0.1825	0.2857	986.8
400.0	0.2556	139.0	1.70	65.42	92.40	1.288	0.1821	0.2829	1002.0
410.0	0.2635	145.0	1.64	67.40	95.21	1.295	0.1817	0.2804	1017.0
420.0	0.2714	150.0	1.59	69.36	98.01	1.302	0.1814	0.2782	1031.0
430.0	0.2792	155.0	1.54	71.31	100.8	1.308	0.1812	0.2762	1045.0
440.0	0.2869	160.0	1.49	73.25	103.5	1.315	0.1809	0.2744	1059.0
450.0	0.2946	164.0	1.45	75.18	106.3	1.321	0.1807	0.2728	1073.0
460.0	0.3022	169.0	1.41	77.09	109.0	1.327	0.1805	0.2714	1086.0
470.0	0.3097	174.0	1.37	79.00	111.7	1.333	0.1804	0.2701	1099.0
480.0	0.3172	179.0	1.33	80.90	114.4	1.338	0.1802	0.2689	1112.0
490.0	0.3247	183.0	1.30	82.80	117.1	1.344	0.1801	0.2678	1124.0
500.0	0.3322	188.0	1.26	84.69	119.7	1.349	0.1799	0.2668	1136.0
510.0	0.3396	193.0	1.23	86.57	122.4	1.354	0.1798	0.2659	1148.0
520.0	0.3469	197.0	1.20	88.45	125.1	1.360	0.1797	0.2651	1160.0
530.0	0.3543	202.0	1.18	90.32	127.7	1.365	0.1797	0.2643	1172.0
540.0	0.3616	206.0	1.15	92.18	130.4	1.370	0.1796	0.2636	1184.0
550.0	0.3689	211.0	1.13	94.05	133.0	1.374	0.1795	0.2629	1195.0
560.0	0.3761	215.0	1.10	95.91	135.6	1.379	0.1795	0.2623	1206.0
570.0	0.3834	219.0	1.08	97.76	138.2	1.384	0.1794	0.2617	1218.0
580.0	0.3906	224.0	1.06	99.6	140.8	1.388	0.1794	0.2612	1229.0
590.0	0.3978	228.0	1.04	101.5	143.5	1.393	0.1794	0.2607	1239.0
600.0	0.4050	232.0	1.02	103.3	146.1	1.397	0.1793	0.2602	1250.0
700.0	0.4759	275.0	0.853	121.7	171.9	1.437	0.1795	0.2573	1351.0
800.0	0.5457	316.0	0.737	140.0	197.6	1.471	0.1804	0.2563	1442.0
900.0	0.6149	357.0	0.650	158.3	223.2	1.502	0.1820	0.2566	1526.0
1000.0	0.6836	396.0	0.581	176.8	248.9	1.529	0.1842	0.2579	1604.0
1500.0	1.023	592.0	0.383	272.9	380.9	1.635	0.1991	0.2710	1933.0
2000.0	1.361	785.0	0.286	376.2	519.3	1.715	0.2128	0.2841	2204.0
2500.0	1.698	978.0	0.228	485.3	664.5	1.780	0.2226	0.2937	2445.0
3000.0	2.034	1170.0	0.190	598.4	813.1	1.834	0.2294	0.3004	2664.0
3500.0	2.370	1360.0	0.163	714.4	964.5	1.881	0.2342	0.3051	2867.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

570 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.67	199.0	16.3	93600.0	0.00233	0.0925	18.1	0.00364	1.46206	3.34
125.0	53.01	191.0	14.9	80800.0	0.00251	0.0895	15.7	0.00353	1.45581	3.01
130.0	52.34	182.0	14.0	70300.0	0.00264	0.0865	13.9	0.00344	1.44932	2.78
135.0	51.63	173.0	13.2	61600.0	0.00273	0.0835	12.6	0.00336	1.44259	2.62
140.0	50.90	165.0	12.6	54300.0	0.00292	0.0805	11.6	0.00328	1.43564	2.50
145.0	50.15	158.0	12.0	48000.0	0.00305	0.0775	10.6	0.00320	1.42848	2.37
150.0	49.37	152.0	11.5	42600.0	0.00320	0.0746	9.70	0.00312	1.42111	2.27
155.0	48.57	145.0	11.0	37700.0	0.00335	0.0717	8.94	0.00303	1.41355	2.20
160.0	47.74	139.0	10.5	33400.0	0.00352	0.0688	8.33	0.00294	1.40576	2.13
165.0	46.89	134.0	10.0	29500.0	0.00370	0.0661	7.71	0.00285	1.33775	2.08
170.0	46.01	128.0	9.55	25900.0	0.00391	0.0633	7.13	0.00275	1.38949	2.03
175.0	45.09	123.0	9.10	22600.0	0.00414	0.0606	6.59	0.00264	1.38094	1.99
180.0	44.14	117.0	8.65	19700.0	0.00442	0.0579	6.08	0.00253	1.37208	1.96
185.0	43.14	112.0	8.21	16900.0	0.00474	0.0552	5.59	0.00242	1.36284	1.93
190.0	42.09	106.0	7.78	14400.0	0.00512	0.0525	5.14	0.00230	1.35316	1.91
200.0	39.80	93.9	6.92	10000.0	0.00613	0.0472	4.28	0.00204	1.33212	1.90
205.0	38.51	87.5	6.49	8050.0	0.00697	0.0445	3.87	0.00189	1.32044	1.91
210.0	37.10	80.5	6.04	6230.0	0.00806	0.0418	3.48	0.00173	1.30763	1.95
215.0	35.49	72.9	5.56	4540.0	0.00973	0.0391	3.08	0.00155	1.29317	2.02
220.0	33.57	64.1	5.03	2980.0	0.0128	0.0365	2.67	0.00132	1.27601	2.16
225.0	31.02	53.5	4.38	1560.0	0.0200	0.0341	2.22	0.00103	1.25346	2.51
230.0	26.37	39.3	3.43	370.0	0.0588	0.0321	1.62	0.000528	1.21296	4.18
235.0	15.36	31.4	2.60	119.0	0.0840	0.0232	0.951	0.000574	1.12059	3.88
240.0	11.86	33.9	2.57	211.0	0.0340	0.0172	0.860	0.00126	1.09226	2.07
245.0	10.36	36.5	2.56	272.0	0.0220	0.0151	0.834	0.00181	1.08028	1.60
250.0	9.421	39.0	2.55	315.0	0.0167	0.0139	0.824	0.00227	1.07279	1.39
255.0	8.737	41.3	2.55	348.0	0.0137	0.0132	0.819	0.00268	1.06739	1.26
260.0	8.203	43.5	2.54	373.0	0.0117	0.0127	0.819	0.00305	1.06318	1.18
265.0	7.767	45.6	2.53	394.0	0.0103	0.0124	0.821	0.00341	1.05974	1.12
270.0	7.398	47.6	2.53	411.0	0.00921	0.0122	0.824	0.00375	1.05685	1.07
275.0	7.080	49.5	2.52	426.0	0.00834	0.0120	0.829	0.00408	1.05436	1.03
280.0	6.801	51.4	2.52	439.0	0.00772	0.0119	0.834	0.00440	1.05218	1.00
285.0	6.553	53.3	2.51	450.0	0.00717	0.0118	0.840	0.00472	1.05024	0.978
290.0	6.330	55.1	2.50	459.0	0.00671	0.0118	0.847	0.00504	1.04850	0.956
295.0	6.127	56.9	2.50	468.0	0.00631	0.0118	0.854	0.00535	1.04692	0.937
300.0	5.942	58.7	2.49	476.0	0.00597	0.0118	0.861	0.00567	1.04548	0.920
310.0	5.615	62.2	2.48	489.0	0.00540	0.0119	0.876	0.00630	1.04293	0.892
320.0	5.332	65.5	2.47	500.0	0.00495	0.0120	0.892	0.00693	1.04074	0.870
330.0	5.084	68.8	2.45	509.0	0.00458	0.0121	0.909	0.00756	1.03882	0.852
340.0	4.864	72.1	2.44	517.0	0.00426	0.0123	0.926	0.00819	1.03712	0.837
350.0	4.666	75.2	2.43	523.0	0.00401	0.0124	0.943	0.00883	1.03559	0.824
360.0	4.488	78.4	2.43	529.0	0.00378	0.0126	0.960	0.00947	1.03421	0.813
370.0	4.326	81.5	2.42	534.0	0.00359	0.0128	0.978	0.0101	1.03296	0.805
380.0	4.177	84.5	2.41	538.0	0.00342	0.0130	0.995	0.0108	1.03181	0.797
390.0	4.040	87.6	2.40	542.0	0.00326	0.0132	1.01	0.0114	1.03076	0.790
400.0	3.913	90.6	2.39	546.0	0.00312	0.0134	1.03	0.0121	1.02978	0.784
410.0	3.795	93.6	2.38	549.0	0.00300	0.0136	1.05	0.0127	1.02887	0.779
420.0	3.685	96.5	2.38	552.0	0.00288	0.0138	1.06	0.0134	1.02803	0.775
430.0	3.582	99.4	2.37	554.0	0.00278	0.0140	1.08	0.0141	1.02724	0.771
440.0	3.486	102.0	2.37	556.0	0.00268	0.0142	1.10	0.0148	1.02650	0.767
450.0	3.395	105.0	2.36	558.0	0.00259	0.0144	1.12	0.0155	1.02580	0.764
460.0	3.309	108.0	2.35	560.0	0.00251	0.0146	1.13	0.0162	1.02515	0.761
470.0	3.229	111.0	2.35	562.0	0.00243	0.0148	1.15	0.0169	1.02453	0.758
480.0	3.152	114.0	2.34	563.0	0.00236	0.0150	1.17	0.0176	1.02394	0.756
490.0	3.080	117.0	2.34	565.0	0.00230	0.0152	1.18	0.0184	1.02339	0.754
500.0	3.011	119.0	2.33	566.0	0.00223	0.0154	1.20	0.0191	1.02286	0.752
510.0	2.945	122.0	2.33	567.0	0.00218	0.0156	1.22	0.0199	1.02236	0.750
520.0	2.882	125.0	2.32	568.0	0.00212	0.0158	1.23	0.0206	1.02188	0.748
530.0	2.823	128.0	2.32	569.0	0.00207	0.0160	1.25	0.0214	1.02142	0.746
540.0	2.766	131.0	2.32	570.0	0.00202	0.0162	1.27	0.0222	1.02098	0.745
550.0	2.711	133.0	2.31	571.0	0.00197	0.0163	1.23	0.0229	1.02057	0.743
560.0	2.659	136.0	2.31	572.0	0.00193	0.0165	1.30	0.0237	1.02017	0.742
570.0	2.608	139.0	2.30	572.0	0.00189	0.0167	1.32	0.0245	1.01978	0.741
580.0	2.560	142.0	2.30	573.0	0.00184	0.0169	1.33	0.0253	1.01941	0.739
590.0	2.514	144.0	2.30	573.0	0.00181	0.0171	1.35	0.0261	1.01906	0.738
600.0	2.469	147.0	2.29	574.0	0.00177	0.0173	1.36	0.0270	1.01872	0.737
700.0	2.101	174.0	2.26	578.0	0.00143	0.0193	1.52	0.0356	1.01591	0.729
800.0	1.832	201.0	2.23	579.0	0.00127	0.0211	1.66	0.0450	1.01387	0.723
900.0	1.626	229.0	2.19	580.0	0.00112	0.0230	1.79	0.0552	1.01230	0.720
1000.0	1.463	257.0	2.16	580.0	0.00100	0.0249	1.92	0.0659	1.01106	0.718
1500.0	0.9771	410.0	1.97	579.0	0.000661					
2000.0	0.7348	574.0	1.83	577.0	0.000495					
2500.0	0.5891	741.0	1.74	576.0	0.000396					
3000.0	0.4917	909.0	1.69	575.0	0.000331					
3500.0	0.4219	1080.0	1.65	574.0	0.0002e4					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

580 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01863	1750.0	222.0	-62.26	-60.26	0.6010	0.2549	0.4733	3876.0
125.0	0.01885	1530.0	203.0	-59.90	-57.88	0.6205	0.2564	0.4782	3631.0
130.0	0.01910	1350.0	186.0	-57.53	-55.48	0.6393	0.2545	0.4804	3430.0
135.0	0.01937	1200.0	171.0	-55.15	-53.07	0.6574	0.2511	0.4814	3259.0
140.0	0.01964	1070.0	158.0	-52.78	-50.67	0.6749	0.2472	0.4820	3107.0
145.0	0.01994	960.0	147.0	-50.40	-48.25	0.6919	0.2434	0.4828	2970.0
150.0	0.02025	864.0	136.0	-48.01	-45.84	0.7083	0.2400	0.4843	2842.0
155.0	0.02058	778.0	126.0	-45.62	-43.41	0.7242	0.2369	0.4866	2721.0
160.0	0.02094	701.0	117.0	-43.22	-40.97	0.7397	0.2344	0.4899	2605.0
165.0	0.02132	630.0	109.0	-40.80	-38.51	0.7548	0.2322	0.4944	2493.0
170.0	0.02173	565.0	101.0	-38.36	-36.02	0.7697	0.2304	0.5003	2384.0
175.0	0.02217	504.0	93.9	-35.88	-33.50	0.7843	0.2288	0.5076	2276.0
180.0	0.02264	448.0	87.0	-33.38	-30.94	0.7987	0.2276	0.5166	2170.0
185.0	0.02317	395.0	80.4	-30.82	-28.33	0.8130	0.2266	0.5276	2064.0
190.0	0.02374	345.0	74.1	-28.21	-25.66	0.8272	0.2257	0.5411	1958.0
200.0	0.02510	254.0	62.1	-22.77	-20.08	0.8559	0.2247	0.5792	1741.0
205.0	0.02593	211.0	56.3	-19.90	-17.11	0.8705	0.2245	0.6075	1627.0
210.0	0.02691	170.0	50.5	-16.88	-13.98	0.8856	0.2246	0.6469	1508.0
215.0	0.02812	131.0	44.7	-13.63	-10.61	0.9014	0.2251	0.7067	1378.0
220.0	0.02969	91.7	38.6	-10.04	-6.856	0.9188	0.2265	0.8097	1232.0
225.0	0.03204	53.5	31.8	-5.772	-2.330	0.9391	0.2297	1.036	1058.0
230.0	0.03704	17.6	22.9	0.5132	4.431	0.9690	0.2385	1.973	821.7
235.0	0.05975	6.92	11.1	14.32	20.74	1.039	0.2527	3.032	620.5
240.0	0.08034	16.3	7.64	21.66	30.23	1.079	0.2380	1.262	633.8
245.0	0.09300	25.0	6.29	25.39	35.38	1.100	0.2275	0.8485	656.8
250.0	0.1028	32.3	5.48	28.10	39.14	1.115	0.2200	0.6758	677.9
255.0	0.1112	38.7	4.93	30.32	42.26	1.128	0.2143	0.5803	697.0
260.0	0.1187	44.5	4.51	32.26	45.00	1.138	0.2098	0.5193	714.5
265.0	0.1255	49.8	4.18	34.00	47.49	1.148	0.2062	0.4767	730.7
270.0	0.1319	54.8	3.90	35.62	49.79	1.156	0.2031	0.4453	745.9
275.0	0.1380	59.4	3.68	37.13	51.95	1.164	0.2005	0.4211	760.2
280.0	0.1437	63.8	3.48	38.57	54.01	1.172	0.1984	0.4018	773.8
285.0	0.1493	68.0	3.31	39.95	55.98	1.179	0.1965	0.3862	786.7
290.0	0.1546	72.0	3.16	41.27	57.87	1.185	0.1949	0.3732	799.1
295.0	0.1598	75.8	3.03	42.55	59.71	1.192	0.1934	0.3623	811.1
300.0	0.1648	79.5	2.91	43.80	61.50	1.198	0.1922	0.3529	822.6
310.0	0.1745	86.6	2.70	46.20	64.95	1.209	0.1901	0.3378	844.5
320.0	0.1839	93.3	2.53	48.52	68.27	1.219	0.1884	0.3262	865.1
330.0	0.1929	100.0	2.39	50.76	71.48	1.229	0.1871	0.3169	884.7
340.0	0.2017	106.0	2.26	52.95	74.61	1.239	0.1860	0.3094	903.4
350.0	0.2103	112.0	2.15	55.09	77.67	1.248	0.1850	0.3032	921.4
360.0	0.2187	118.0	2.05	57.19	80.68	1.256	0.1843	0.2980	938.6
370.0	0.2269	123.0	1.96	59.26	83.63	1.264	0.1836	0.2935	955.3
380.0	0.2351	129.0	1.88	61.30	86.55	1.272	0.1831	0.2897	971.4
390.0	0.2431	134.0	1.81	63.32	89.43	1.279	0.1826	0.2864	987.1
400.0	0.2510	139.0	1.74	65.32	92.28	1.287	0.1822	0.2835	1002.0
410.0	0.2588	144.0	1.68	67.31	95.10	1.294	0.1818	0.2810	1017.0
420.0	0.2665	150.0	1.62	69.27	97.90	1.300	0.1815	0.2787	1032.0
430.0	0.2742	155.0	1.57	71.23	100.7	1.307	0.1812	0.2767	1046.0
440.0	0.2818	159.0	1.52	73.17	103.4	1.313	0.1810	0.2749	1059.0
450.0	0.2894	164.0	1.48	75.10	106.2	1.319	0.1808	0.2733	1073.0
460.0	0.2969	169.0	1.43	77.02	108.9	1.325	0.1806	0.2718	1086.0
470.0	0.3043	174.0	1.39	78.93	111.6	1.331	0.1804	0.2705	1099.0
480.0	0.3117	179.0	1.36	80.63	114.3	1.337	0.1802	0.2693	1112.0
490.0	0.3191	183.0	1.32	82.73	117.0	1.342	0.1801	0.2682	1125.0
500.0	0.3264	188.0	1.29	84.62	119.7	1.348	0.1800	0.2671	1137.0
510.0	0.3337	193.0	1.26	86.50	122.3	1.353	0.1799	0.2662	1149.0
520.0	0.3409	197.0	1.23	88.38	125.0	1.358	0.1798	0.2653	1161.0
530.0	0.3482	202.0	1.20	90.26	127.6	1.363	0.1797	0.2646	1173.0
540.0	0.3554	206.0	1.17	92.12	130.3	1.368	0.1796	0.2638	1184.0
550.0	0.3625	211.0	1.15	93.99	132.9	1.373	0.1796	0.2631	1196.0
560.0	0.3697	215.0	1.12	95.85	135.6	1.378	0.1795	0.2625	1207.0
570.0	0.3768	219.0	1.10	97.71	138.2	1.382	0.1795	0.2619	1218.0
580.0	0.3839	224.0	1.08	99.6	140.8	1.387	0.1794	0.2614	1229.0
590.0	0.3910	228.0	1.06	101.4	143.4	1.391	0.1794	0.2609	1240.0
600.0	0.3980	233.0	1.03	103.3	146.0	1.396	0.1794	0.2604	1251.0
700.0	0.4678	275.0	0.869	121.6	171.9	1.436	0.1795	0.2574	1351.0
800.0	0.5365	316.0	0.750	139.9	197.6	1.470	0.1805	0.2564	1443.0
900.0	0.6045	357.0	0.661	158.3	223.2	1.500	0.1821	0.2567	1527.0
1000.0	0.6720	397.0	0.592	176.8	248.9	1.527	0.1842	0.2580	1604.0
1500.0	1.006	593.0	0.389	272.9	381.0	1.634	0.1991	0.2710	1933.0
2000.0	1.338	786.0	0.291	376.2	519.9	1.714	0.2128	0.2841	2205.0
2500.0	1.669	978.0	0.232	485.3	664.5	1.779	0.2226	0.2937	2445.0
3000.0	1.999	1170.0	0.193	598.4	813.1	1.833	0.2294	0.3004	2664.0
3500.0	2.329	1360.0	0.166	714.4	964.6	1.879	0.2342	0.3051	2867.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

580 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.67	200.0	16.3	93700.0	0.00237	0.0925	18.1	0.00364	1.46211	3.34
125.0	53.02	191.0	14.9	80900.0	0.00251	0.0895	15.7	0.00353	1.45587	3.02
130.0	52.34	182.0	14.0	70400.0	0.00264	0.0865	13.9	0.00344	1.44939	2.78
135.0	51.64	173.0	13.2	61700.0	0.00278	0.0835	12.6	0.00336	1.44267	2.62
140.0	50.91	166.0	12.6	54400.0	0.00291	0.0805	11.6	0.00328	1.43573	2.50
145.0	50.16	158.0	12.0	48100.0	0.00305	0.0776	10.6	0.00320	1.42858	2.37
150.0	49.38	152.0	11.5	42700.0	0.00319	0.0746	9.71	0.00312	1.42122	2.27
155.0	48.58	146.0	11.0	37800.0	0.00334	0.0716	9.00	0.00304	1.41367	2.20
160.0	47.76	140.0	10.5	33500.0	0.00351	0.0689	8.34	0.00295	1.40590	2.13
165.0	46.91	134.0	10.0	29600.0	0.00368	0.0661	7.72	0.00285	1.39790	2.08
170.0	46.02	128.0	9.55	26000.0	0.00390	0.0634	7.14	0.00275	1.38965	2.03
175.0	45.11	123.0	9.10	22700.0	0.00413	0.0606	6.60	0.00265	1.38113	1.99
180.0	44.16	117.0	8.66	19800.0	0.00440	0.0579	6.09	0.00254	1.37228	1.95
185.0	43.17	112.0	8.22	17000.0	0.00472	0.0553	5.61	0.00243	1.36307	1.93
190.0	42.12	106.0	7.79	14500.0	0.00510	0.0526	5.15	0.00231	1.35343	1.91
200.0	39.84	94.3	6.94	10100.0	0.00614	0.0473	4.29	0.00205	1.33248	1.89
205.0	38.56	87.9	6.50	8140.0	0.00691	0.0446	3.83	0.00190	1.32087	1.91
210.0	37.16	81.0	6.06	6330.0	0.00799	0.0419	3.43	0.00174	1.30816	1.94
215.0	35.57	73.4	5.58	4640.0	0.00963	0.0392	3.10	0.00156	1.29386	2.01
220.0	33.68	64.8	5.06	3090.0	0.0125	0.0367	2.83	0.00134	1.27700	2.14
225.0	31.21	54.5	4.43	1670.0	0.0190	0.0343	2.25	0.00106	1.25515	2.45
230.0	27.00	41.0	3.55	476.0	0.0481	0.0322	1.68	0.000604	1.21843	3.72
235.0	16.73	31.6	2.63	116.0	0.0961	0.0250	1.00	0.000493	1.13185	4.36
240.0	12.45	33.6	2.58	203.0	0.0376	0.0180	0.876	0.00115	1.09696	2.21
245.0	10.75	36.2	2.57	268.0	0.0234	0.0155	0.844	0.00170	1.08339	1.66
250.0	9.725	38.7	2.56	314.0	0.0175	0.0142	0.831	0.00217	1.07520	1.42
255.0	8.992	41.0	2.56	348.0	0.0141	0.0134	0.825	0.00257	1.06940	1.28
260.0	8.426	43.2	2.55	375.0	0.0120	0.0129	0.824	0.00295	1.06493	1.19
265.0	7.966	45.3	2.54	397.0	0.0105	0.0125	0.825	0.00330	1.06131	1.13
270.0	7.579	47.3	2.54	415.0	0.00940	0.0123	0.828	0.00364	1.05827	1.08
275.0	7.248	49.3	2.53	431.0	0.00854	0.0121	0.832	0.00397	1.05567	1.04
280.0	6.957	51.2	2.52	444.0	0.00784	0.0120	0.838	0.00429	1.05340	1.01
285.0	6.699	53.1	2.52	455.0	0.00727	0.0119	0.843	0.00460	1.05138	0.984
290.0	6.468	54.9	2.51	465.0	0.00679	0.0119	0.850	0.00492	1.04958	0.962
295.0	6.259	56.7	2.50	474.0	0.00638	0.0119	0.857	0.00523	1.04795	0.942
300.0	6.068	58.5	2.50	483.0	0.00603	0.0119	0.864	0.00554	1.04646	0.925
310.0	5.730	62.0	2.48	496.0	0.00545	0.0119	0.879	0.00616	1.04383	0.896
320.0	5.439	65.4	2.47	508.0	0.00499	0.0120	0.895	0.00678	1.04157	0.873
330.0	5.184	68.7	2.46	517.0	0.00462	0.0122	0.911	0.00741	1.03960	0.854
340.0	4.958	71.9	2.45	525.0	0.00430	0.0123	0.928	0.00803	1.03785	0.839
350.0	4.756	75.1	2.44	532.0	0.00404	0.0125	0.945	0.00866	1.03628	0.826
360.0	4.573	78.3	2.43	538.0	0.00381	0.0127	0.962	0.00929	1.03487	0.815
370.0	4.407	81.4	2.42	543.0	0.00361	0.0128	0.979	0.00993	1.03359	0.806
380.0	4.254	84.4	2.41	548.0	0.00343	0.0130	1.00	0.0106	1.03241	0.798
390.0	4.114	87.5	2.40	552.0	0.00327	0.0132	1.01	0.0112	1.03133	0.791
400.0	3.984	90.5	2.40	555.0	0.00313	0.0134	1.03	0.0119	1.03033	0.785
410.0	3.864	93.5	2.39	558.0	0.00301	0.0136	1.05	0.0125	1.02941	0.780
420.0	3.752	96.4	2.38	561.0	0.00289	0.0138	1.07	0.0132	1.02854	0.776
430.0	3.647	99.3	2.38	564.0	0.00279	0.0140	1.08	0.0139	1.02774	0.772
440.0	3.548	102.0	2.37	566.0	0.00269	0.0142	1.10	0.0145	1.02698	0.768
450.0	3.456	105.0	2.36	568.0	0.00260	0.0144	1.12	0.0152	1.02627	0.765
460.0	3.369	108.0	2.36	570.0	0.00252	0.0146	1.14	0.0159	1.02560	0.762
470.0	3.286	111.0	2.35	572.0	0.00244	0.0148	1.15	0.0166	1.02497	0.759
480.0	3.208	114.0	2.35	573.0	0.00237	0.0150	1.17	0.0173	1.02437	0.756
490.0	3.134	117.0	2.34	575.0	0.00230	0.0152	1.19	0.0181	1.02380	0.754
500.0	3.064	119.0	2.34	576.0	0.00224	0.0154	1.20	0.0188	1.02326	0.752
510.0	2.997	122.0	2.33	577.0	0.00218	0.0156	1.22	0.0195	1.02275	0.750
520.0	2.933	125.0	2.33	578.0	0.00212	0.0158	1.24	0.0203	1.02226	0.748
530.0	2.872	128.0	2.32	579.0	0.00207	0.0160	1.25	0.0210	1.02180	0.747
540.0	2.814	131.0	2.32	580.0	0.00202	0.0162	1.27	0.0218	1.02135	0.745
550.0	2.758	133.0	2.32	581.0	0.00197	0.0164	1.28	0.0226	1.02093	0.743
560.0	2.705	136.0	2.31	582.0	0.00193	0.0166	1.30	0.0233	1.02052	0.742
570.0	2.654	139.0	2.31	582.0	0.00189	0.0168	1.32	0.0241	1.02013	0.741
580.0	2.605	142.0	2.30	583.0	0.00185	0.0170	1.33	0.0249	1.01976	0.740
590.0	2.558	144.0	2.30	584.0	0.00181	0.0172	1.35	0.0257	1.01939	0.738
600.0	2.512	147.0	2.30	584.0	0.00177	0.0174	1.36	0.0265	1.01905	0.737
700.0	2.138	174.0	2.26	588.0	0.00145	0.0193	1.52	0.0350	1.01619	0.729
800.0	1.864	201.0	2.23	590.0	0.00127	0.0212	1.66	0.0443	1.01411	0.724
900.0	1.654	229.0	2.20	590.0	0.00112	0.0230	1.79	0.0542	1.01251	0.720
1000.0	1.488	257.0	2.16	590.0	0.00100	0.0249	1.92	0.0648	1.01125	0.718
1500.0	0.9940	410.0	1.97	589.0	0.000661					
2000.0	0.7475	574.0	1.83	587.0	0.000495					
2500.0	0.5993	741.0	1.74	586.0	0.000396					
3000.0	0.5002	909.0	1.69	585.0	0.000331					
3500.0	0.4293	1080.0	1.65	584.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

590 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01863	1750.0	222.0	-62.27	-60.23	0.6009	0.2552	0.4732	3875.0
125.0	0.01885	1530.0	203.0	-59.91	-57.85	0.6204	0.2566	0.4781	3631.0
130.0	0.01910	1350.0	186.0	-57.54	-55.46	0.6352	0.2547	0.4802	3431.0
135.0	0.01935	1200.0	171.0	-55.17	-53.05	0.6573	0.2513	0.4812	3259.0
140.0	0.01964	1070.0	158.0	-52.79	-50.64	0.6748	0.2474	0.4818	3108.0
145.0	0.01993	961.0	147.0	-50.41	-48.23	0.6917	0.2436	0.4826	2971.0
150.0	0.02025	866.0	136.0	-48.03	-45.82	0.7081	0.2401	0.4841	2843.0
155.0	0.02058	780.0	126.0	-45.64	-43.39	0.7240	0.2371	0.4863	2723.0
160.0	0.02093	703.0	118.0	-43.24	-40.95	0.7395	0.2345	0.4896	2607.0
165.0	0.02131	632.0	109.0	-40.82	-38.49	0.7547	0.2323	0.4941	2495.0
170.0	0.02172	567.0	101.0	-38.38	-36.01	0.7695	0.2305	0.4999	2386.0
175.0	0.02216	506.0	94.1	-35.91	-33.49	0.7841	0.2289	0.5071	2279.0
180.0	0.02263	450.0	87.1	-33.41	-30.93	0.7985	0.2277	0.5160	2173.0
185.0	0.02315	397.0	80.5	-30.86	-28.33	0.8128	0.2266	0.5269	2067.0
190.0	0.02372	347.0	74.2	-28.25	-25.66	0.8270	0.2258	0.5402	1962.0
200.0	0.02503	256.0	62.3	-22.83	-20.09	0.8556	0.2247	0.5776	1746.0
205.0	0.02590	213.0	56.5	-19.96	-17.13	0.8702	0.2245	0.6053	1633.0
210.0	0.02687	173.0	50.8	-16.95	-14.02	0.8852	0.2245	0.6436	1514.0
215.0	0.02805	133.0	45.0	-13.73	-10.67	0.9005	0.2251	0.7011	1386.0
220.0	0.02960	94.5	38.9	-10.18	-6.951	0.9181	0.2263	0.7986	1243.0
225.0	0.03185	56.7	32.2	-5.999	-2.518	0.9380	0.2292	1.005	1073.0
230.0	0.03834	21.1	23.8	-0.1035	3.967	0.9660	0.2370	1.747	849.5
235.0	0.05491	6.72	12.4	12.37	19.37	1.028	0.2530	3.242	631.6
240.0	0.07641	15.0	8.14	20.71	23.05	1.073	0.2400	1.390	633.5
245.0	0.08957	23.7	6.60	24.76	34.55	1.096	0.2291	0.8984	655.7
250.0	0.0936	31.1	5.71	27.61	38.49	1.112	0.2212	0.7027	676.8
255.0	0.1081	37.7	5.11	29.92	41.72	1.125	0.2153	0.5975	696.0
260.0	0.1156	43.6	4.66	31.91	44.53	1.136	0.2106	0.5314	713.6
265.0	0.1224	49.0	4.31	33.69	47.07	1.145	0.2068	0.4858	729.9
270.0	0.1288	54.0	4.02	35.34	49.41	1.154	0.2037	0.4524	745.2
275.0	0.1348	58.7	3.78	36.88	51.61	1.162	0.2011	0.4269	759.6
280.0	0.1406	63.1	3.58	38.33	53.69	1.170	0.1988	0.4067	773.3
285.0	0.1460	67.3	3.40	39.72	55.68	1.177	0.1969	0.3903	786.3
290.0	0.1513	71.4	3.25	41.06	57.60	1.183	0.1952	0.3767	798.8
295.0	0.1565	75.2	3.11	42.36	59.45	1.190	0.1938	0.3653	810.8
300.0	0.1615	79.0	2.98	43.61	61.25	1.196	0.1925	0.3556	822.3
310.0	0.1711	86.1	2.77	46.04	64.73	1.207	0.1903	0.3400	844.3
320.0	0.1803	92.9	2.59	48.36	68.06	1.218	0.1886	0.3279	865.1
330.0	0.1892	99.4	2.44	50.62	71.29	1.228	0.1872	0.3184	884.7
340.0	0.1979	106.0	2.31	52.81	74.44	1.237	0.1861	0.3107	903.5
350.0	0.2064	112.0	2.19	54.96	77.51	1.246	0.1852	0.3043	921.5
360.0	0.2147	117.0	2.09	57.07	80.53	1.255	0.1844	0.2989	938.8
370.0	0.2228	123.0	2.00	59.15	83.49	1.263	0.1837	0.2944	955.5
380.0	0.2308	128.0	1.92	61.20	86.42	1.270	0.1832	0.2905	971.7
390.0	0.2387	134.0	1.84	63.22	89.31	1.278	0.1827	0.2871	987.4
400.0	0.2465	139.0	1.77	65.23	92.16	1.285	0.1823	0.2842	1003.0
410.0	0.2542	144.0	1.71	67.21	94.99	1.292	0.1819	0.2816	1017.0
420.0	0.2619	149.0	1.65	69.18	97.79	1.299	0.1816	0.2793	1032.0
430.0	0.2694	154.0	1.60	71.14	100.6	1.305	0.1813	0.2772	1046.0
440.0	0.2769	159.0	1.55	73.08	103.3	1.312	0.1810	0.2754	1060.0
450.0	0.2844	164.0	1.51	75.02	106.1	1.318	0.1808	0.2737	1073.0
460.0	0.2917	169.0	1.46	76.94	108.8	1.324	0.1806	0.2722	1087.0
470.0	0.2991	174.0	1.42	78.85	111.5	1.330	0.1805	0.2709	1100.0
480.0	0.3064	179.0	1.38	80.76	114.2	1.336	0.1803	0.2696	1112.0
490.0	0.3136	183.0	1.35	82.66	116.9	1.341	0.1802	0.2685	1125.0
500.0	0.3208	188.0	1.31	84.55	119.6	1.346	0.1800	0.2675	1137.0
510.0	0.3280	193.0	1.28	86.44	122.3	1.352	0.1799	0.2665	1150.0
520.0	0.3351	197.0	1.25	88.32	124.9	1.357	0.1798	0.2656	1161.0
530.0	0.3423	202.0	1.22	90.19	127.6	1.362	0.1797	0.2648	1173.0
540.0	0.3493	206.0	1.19	92.06	130.2	1.367	0.1797	0.2641	1185.0
550.0	0.3564	211.0	1.17	93.93	132.9	1.372	0.1796	0.2634	1196.0
560.0	0.3634	215.0	1.14	95.79	135.5	1.377	0.1795	0.2628	1208.0
570.0	0.3704	219.0	1.12	97.65	138.1	1.381	0.1795	0.2622	1219.0
580.0	0.3774	224.0	1.10	99.5	140.7	1.386	0.1794	0.2616	1230.0
590.0	0.3844	228.0	1.07	101.4	143.4	1.390	0.1794	0.2611	1241.0
600.0	0.3913	233.0	1.05	103.2	146.0	1.395	0.1794	0.2606	1251.0
700.0	0.4600	275.0	0.884	121.6	171.9	1.434	0.1796	0.2575	1352.0
800.0	0.5275	316.0	0.764	139.9	197.5	1.469	0.1805	0.2565	1443.0
900.0	0.5944	357.0	0.673	158.3	223.2	1.499	0.1821	0.2568	1527.0
1000.0	0.6608	397.0	0.602	176.7	248.3	1.526	0.1842	0.2581	1605.0
1500.0	0.9893	593.0	0.396	272.9	381.0	1.633	0.1931	0.2710	1934.0
2000.0	1.315	786.0	0.296	376.2	519.3	1.713	0.2128	0.2841	2205.0
2500.0	1.641	978.0	0.236	485.3	664.5	1.777	0.2226	0.2938	2446.0
3000.0	1.966	1170.0	0.197	598.4	813.2	1.832	0.2294	0.3004	2665.0
3500.0	2.290	1360.0	0.169	714.4	964.6	1.878	0.2342	0.3051	2867.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

590 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial V)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)_P/V$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	1/DEG. R	BTU/FT-HR-R	LB/FT-SEC x 10^5	SQ FT/HR		
120.0	53.68	200.0	16.2	33400.0	0.00237	0.0925	18.2	0.00354	1.46217	3.34
125.0	53.03	191.0	14.9	31000.0	0.00250	0.0895	15.7	0.00353	1.45594	3.02
130.0	52.35	182.0	13.9	70500.0	0.00264	0.0865	13.9	0.00344	1.44946	2.78
135.0	51.65	174.0	13.2	61800.0	0.00277	0.0835	12.6	0.00336	1.44275	2.62
140.0	50.92	166.0	12.6	54500.0	0.00291	0.0806	11.6	0.00328	1.43581	2.50
145.0	50.17	159.0	12.0	48200.0	0.00304	0.0776	10.6	0.00321	1.42867	2.37
150.0	49.39	152.0	11.5	42800.0	0.00319	0.0747	9.72	0.00312	1.42133	2.27
155.0	48.59	146.0	11.0	37900.0	0.00334	0.0718	9.01	0.00304	1.41379	2.20
160.0	47.77	140.0	10.5	33600.0	0.00350	0.0690	8.35	0.00295	1.40603	2.13
165.0	46.92	134.0	10.0	29600.0	0.00368	0.0662	7.73	0.00285	1.39805	2.08
170.0	46.04	129.0	9.56	26100.0	0.00389	0.0634	7.15	0.00276	1.38982	2.03
175.0	45.13	123.0	9.10	22300.0	0.00412	0.0607	6.61	0.00265	1.38131	1.99
180.0	44.18	118.0	8.66	19900.0	0.00433	0.0580	6.10	0.00254	1.37249	1.95
185.0	43.19	112.0	8.23	17100.0	0.00470	0.0553	5.62	0.00243	1.36331	1.93
190.0	42.15	106.0	7.80	14600.0	0.00507	0.0527	5.16	0.00231	1.35370	1.91
200.0	39.87	94.7	6.95	10200.0	0.00610	0.0474	4.31	0.00206	1.33284	1.89
205.0	38.61	88.3	6.52	8240.0	0.00686	0.0447	3.90	0.00191	1.32130	1.90
210.0	37.21	81.5	6.07	6430.0	0.00790	0.0420	3.51	0.00175	1.30869	1.94
215.0	35.64	74.0	5.61	4740.0	0.00948	0.0393	3.12	0.00157	1.29454	2.00
220.0	33.79	65.5	5.09	3190.0	0.0122	0.0368	2.71	0.00136	1.27795	2.12
225.0	31.39	55.4	4.48	1780.0	0.0181	0.0344	2.28	0.00109	1.25675	2.40
230.0	27.52	42.6	3.65	581.0	0.0410	0.0322	1.74	0.000671	1.22291	3.40
235.0	18.21	32.1	2.68	122.0	0.101	0.0286	1.06	0.000450	1.14404	4.65
240.0	13.09	33.4	2.59	196.0	0.0416	0.0189	0.894	0.00104	1.10212	2.37
245.0	11.16	36.0	2.58	264.0	0.0250	0.0160	0.854	0.00160	1.08667	1.73
250.0	10.04	38.4	2.57	312.0	0.0183	0.0146	0.838	0.00206	1.07771	1.46
255.0	9.254	40.8	2.56	349.0	0.0147	0.0137	0.831	0.00247	1.07147	1.31
260.0	8.653	43.0	2.56	377.0	0.0124	0.0131	0.829	0.00285	1.06672	1.21
265.0	8.168	45.1	2.55	400.0	0.0108	0.0127	0.830	0.00320	1.06290	1.14
270.0	7.763	47.1	2.54	419.0	0.00960	0.0124	0.832	0.00354	1.05972	1.09
275.0	7.417	49.1	2.54	435.0	0.00869	0.0122	0.836	0.00386	1.05700	1.05
280.0	7.115	51.0	2.53	449.0	0.00797	0.0121	0.841	0.00418	1.05463	1.02
285.0	6.847	52.9	2.52	461.0	0.00738	0.0120	0.847	0.00449	1.05254	0.991
290.0	6.608	54.7	2.52	472.0	0.00688	0.0120	0.853	0.00480	1.05067	0.968
295.0	6.391	56.5	2.51	481.0	0.00646	0.0119	0.859	0.00511	1.04898	0.947
300.0	6.194	58.3	2.50	489.0	0.00610	0.0119	0.866	0.00542	1.04744	0.929
310.0	5.845	61.8	2.49	504.0	0.00550	0.0120	0.881	0.00603	1.04473	0.900
320.0	5.546	65.2	2.48	515.0	0.00503	0.0121	0.897	0.00665	1.04240	0.876
330.0	5.284	68.5	2.47	525.0	0.00465	0.0122	0.913	0.00726	1.04037	0.857
340.0	5.053	71.8	2.46	533.0	0.00433	0.0124	0.930	0.00788	1.03858	0.841
350.0	4.845	75.0	2.44	540.0	0.00406	0.0125	0.946	0.00850	1.03697	0.828
360.0	4.653	78.1	2.44	547.0	0.00383	0.0127	0.964	0.00912	1.03553	0.817
370.0	4.488	81.2	2.43	552.0	0.00362	0.0129	0.981	0.00975	1.03421	0.807
380.0	4.332	84.3	2.42	557.0	0.00345	0.0131	1.00	0.0104	1.03301	0.799
390.0	4.189	87.4	2.41	561.0	0.00329	0.0132	1.02	0.0110	1.03191	0.792
400.0	4.056	90.4	2.40	564.0	0.00314	0.0134	1.03	0.0117	1.03089	0.786
410.0	3.933	93.4	2.39	568.0	0.00302	0.0136	1.05	0.0123	1.02994	0.781
420.0	3.813	96.3	2.39	571.0	0.00290	0.0138	1.07	0.0130	1.02906	0.776
430.0	3.711	99.3	2.38	573.0	0.00279	0.0140	1.08	0.0136	1.02823	0.772
440.0	3.611	102.0	2.37	576.0	0.00270	0.0142	1.10	0.0143	1.02746	0.769
450.0	3.517	105.0	2.37	578.0	0.00261	0.0144	1.12	0.0150	1.02674	0.765
460.0	3.428	108.0	2.36	580.0	0.00252	0.0146	1.14	0.0157	1.02605	0.762
470.0	3.344	111.0	2.36	581.0	0.00244	0.0148	1.15	0.0164	1.02541	0.759
480.0	3.264	114.0	2.35	583.0	0.00237	0.0150	1.17	0.0171	1.02480	0.757
490.0	3.189	117.0	2.34	584.0	0.00230	0.0152	1.19	0.0178	1.02422	0.755
500.0	3.117	119.0	2.34	586.0	0.00224	0.0154	1.20	0.0185	1.02367	0.752
510.0	3.049	122.0	2.34	587.0	0.00218	0.0156	1.22	0.0192	1.02315	0.750
520.0	2.984	125.0	2.33	588.0	0.00213	0.0158	1.24	0.0199	1.02265	0.749
530.0	2.922	128.0	2.33	589.0	0.00207	0.0160	1.25	0.0207	1.02218	0.747
540.0	2.863	130.0	2.32	590.0	0.00202	0.0162	1.27	0.0214	1.02173	0.745
550.0	2.806	133.0	2.32	591.0	0.00198	0.0164	1.29	0.0222	1.02129	0.744
560.0	2.752	136.0	2.31	592.0	0.00193	0.0166	1.30	0.0229	1.02088	0.742
570.0	2.700	139.0	2.31	592.0	0.00188	0.0168	1.32	0.0237	1.02048	0.741
580.0	2.650	142.0	2.31	593.0	0.00185	0.0170	1.33	0.0245	1.02010	0.740
590.0	2.602	144.0	2.30	594.0	0.00181	0.0172	1.35	0.0253	1.01973	0.739
600.0	2.555	147.0	2.30	594.0	0.00177	0.0174	1.37	0.0261	1.01938	0.738
700.0	2.174	174.0	2.27	598.0	0.00148	0.0193	1.52	0.0345	1.01647	0.729
800.0	1.896	201.0	2.23	600.0	0.00127	0.0212	1.66	0.0436	1.01435	0.724
900.0	1.682	229.0	2.20	601.0	0.00112	0.0230	1.80	0.0533	1.01273	0.720
1000.0	1.513	258.0	2.16	601.0	0.00100	0.0249	1.92	0.0638	1.01144	0.718
1500.0	1.011	410.0	1.97	599.0	0.000661					
2000.0	0.7602	574.0	1.83	598.0	0.000495					
2500.0	0.6095	741.0	1.74	596.0	0.000396					
3000.0	0.5088	909.0	1.69	595.0	0.000330					
3500.0	0.4366	1080.0	1.65	595.0	0.000284					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

600 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01863	1750.0	222.0	-62.28	-60.21	0.6009	0.2554	0.4731	3875.0
125.0	0.01886	1530.0	203.0	-59.92	-57.83	0.6203	0.2568	0.4779	3631.0
130.0	0.01910	1350.0	186.0	-57.55	-55.43	0.6391	0.2549	0.4801	3431.0
135.0	0.01935	1200.0	171.0	-55.18	-53.03	0.6572	0.2515	0.4810	3260.0
140.0	0.01964	1070.0	158.0	-52.80	-50.62	0.6747	0.2476	0.4816	3109.0
145.0	0.01993	963.0	147.0	-50.43	-48.21	0.6916	0.2438	0.4824	2972.0
150.0	0.02024	867.0	136.0	-48.05	-45.80	0.7080	0.2403	0.4838	2845.0
155.0	0.02057	782.0	127.0	-45.66	-43.37	0.7239	0.2372	0.4861	2724.0
160.0	0.02093	704.0	118.0	-43.26	-40.93	0.7394	0.2346	0.4893	2609.0
165.0	0.02130	634.0	109.0	-40.84	-38.48	0.7545	0.2324	0.4938	2498.0
170.0	0.02171	568.0	102.0	-38.41	-36.00	0.7693	0.2306	0.4995	2389.0
175.0	0.02215	508.0	94.2	-35.94	-33.48	0.7839	0.2290	0.5066	2282.0
180.0	0.02262	452.0	87.3	-33.44	-30.93	0.7983	0.2278	0.5154	2176.0
185.0	0.02314	399.0	80.7	-30.89	-28.32	0.8126	0.2267	0.5261	2071.0
190.0	0.02371	349.0	74.4	-28.29	-25.66	0.8268	0.2259	0.5393	1965.0
200.0	0.02505	258.0	62.4	-22.88	-20.10	0.8553	0.2247	0.5761	1751.0
205.0	0.02587	216.0	56.7	-20.03	-17.15	0.8698	0.2245	0.6031	1638.0
210.0	0.02683	175.0	51.0	-17.03	-14.05	0.8848	0.2245	0.6404	1521.0
215.0	0.02800	136.0	45.2	-13.83	-10.72	0.9005	0.2250	0.6958	1394.0
220.0	0.02951	97.2	39.3	-10.31	-7.041	0.9174	0.2262	0.7882	1253.0
225.0	0.03168	59.8	32.7	-6.214	-2.694	0.9369	0.2289	0.9772	1087.0
230.0	0.03577	24.6	24.7	-0.6289	3.345	0.9635	0.2357	1.585	874.7
235.0	0.05084	7.09	13.7	10.52	16.17	1.019	0.2520	3.221	647.7
240.0	0.07254	13.7	8.70	19.68	27.74	1.067	0.2420	1.532	634.1
245.0	0.08621	22.4	6.93	24.11	33.68	1.092	0.2306	0.9532	654.9
250.0	0.09645	30.0	5.95	27.11	37.83	1.109	0.2225	0.7316	675.8
255.0	0.1050	36.6	5.30	29.50	41.17	1.122	0.2163	0.6156	695.0
260.0	0.1126	42.6	4.82	31.55	44.06	1.133	0.2115	0.5440	712.7
265.0	0.1194	48.1	4.45	33.38	46.65	1.143	0.2076	0.4952	729.2
270.0	0.1258	53.2	4.14	35.05	49.03	1.152	0.2043	0.4598	744.6
275.0	0.1318	57.9	3.89	36.62	51.26	1.160	0.2016	0.4328	759.1
280.0	0.1375	62.4	3.68	38.09	53.37	1.168	0.1993	0.4116	772.8
285.0	0.1429	66.7	3.49	39.50	55.38	1.175	0.1973	0.3944	785.9
290.0	0.1482	70.8	3.33	40.85	57.32	1.181	0.1956	0.3803	798.5
295.0	0.1533	74.7	3.19	42.16	59.19	1.188	0.1941	0.3685	810.5
300.0	0.1582	78.5	3.06	43.43	61.00	1.194	0.1928	0.3584	822.1
310.0	0.1677	85.7	2.84	45.87	64.50	1.205	0.1906	0.3422	844.2
320.0	0.1769	92.5	2.65	48.21	67.86	1.216	0.1888	0.3298	865.0
330.0	0.1857	99.0	2.49	50.48	71.11	1.226	0.1874	0.3199	884.8
340.0	0.1943	105.0	2.36	52.68	74.27	1.236	0.1863	0.3120	903.6
350.0	0.2026	111.0	2.24	54.84	77.35	1.245	0.1853	0.3054	921.6
360.0	0.2108	117.0	2.14	56.95	80.38	1.253	0.1845	0.3000	939.0
370.0	0.2189	123.0	2.04	59.04	83.35	1.261	0.1838	0.2953	955.7
380.0	0.2268	128.0	1.96	61.09	86.29	1.269	0.1833	0.2913	972.0
390.0	0.2346	134.0	1.88	63.12	89.18	1.277	0.1828	0.2879	987.7
400.0	0.2422	139.0	1.81	65.13	92.04	1.284	0.1823	0.2848	1003.0
410.0	0.2498	144.0	1.75	67.12	94.88	1.291	0.1820	0.2822	1018.0
420.0	0.2574	149.0	1.69	69.09	97.69	1.298	0.1816	0.2798	1032.0
430.0	0.2648	154.0	1.63	71.05	100.5	1.304	0.1814	0.2777	1046.0
440.0	0.2722	159.0	1.58	73.00	103.2	1.310	0.1811	0.2759	1060.0
450.0	0.2795	164.0	1.53	74.94	106.0	1.317	0.1809	0.2742	1074.0
460.0	0.2868	169.0	1.49	76.86	108.7	1.323	0.1807	0.2726	1087.0
470.0	0.2940	174.0	1.45	78.78	111.4	1.329	0.1805	0.2713	1100.0
480.0	0.3012	179.0	1.41	80.69	114.2	1.334	0.1803	0.2700	1113.0
490.0	0.3083	183.0	1.37	82.59	116.8	1.340	0.1802	0.2688	1126.0
500.0	0.3154	188.0	1.34	84.48	119.5	1.345	0.1801	0.2678	1138.0
510.0	0.3225	193.0	1.30	86.37	122.2	1.350	0.1800	0.2668	1150.0
520.0	0.3295	197.0	1.27	88.25	124.9	1.356	0.1799	0.2659	1162.0
530.0	0.3365	202.0	1.24	90.13	127.5	1.361	0.1798	0.2651	1174.0
540.0	0.3435	206.0	1.22	92.00	130.2	1.366	0.1797	0.2643	1185.0
550.0	0.3505	211.0	1.19	93.87	132.8	1.370	0.1796	0.2636	1197.0
560.0	0.3574	215.0	1.16	95.74	135.4	1.375	0.1796	0.2630	1208.0
570.0	0.3643	220.0	1.14	97.60	138.1	1.380	0.1795	0.2624	1219.0
580.0	0.3712	224.0	1.12	99.45	140.7	1.384	0.1795	0.2618	1230.0
590.0	0.3780	228.0	1.09	101.3	143.3	1.389	0.1794	0.2613	1241.0
600.0	0.3849	233.0	1.07	103.2	145.9	1.393	0.1794	0.2608	1252.0
700.0	0.4524	275.0	0.900	121.6	171.8	1.433	0.1796	0.2577	1353.0
800.0	0.5183	317.0	0.777	139.9	197.5	1.468	0.1805	0.2566	1444.0
900.0	0.5847	357.0	0.685	158.2	223.2	1.498	0.1821	0.2568	1528.0
1000.0	0.6500	397.0	0.612	176.7	248.9	1.525	0.1843	0.2581	1606.0
1500.0	0.9730	593.0	0.403	272.9	381.0	1.632	0.1931	0.2711	1934.0
2000.0	1.294	767.0	0.301	376.2	513.3	1.712	0.2128	0.2842	2206.0
2500.0	1.614	979.0	0.240	485.3	664.5	1.776	0.2227	0.2938	2446.0
3000.0	1.933	1170.0	0.200	598.4	813.2	1.830	0.2294	0.3004	2665.0
3500.0	2.252	1360.0	0.171	714.4	964.6	1.877	0.2342	0.3051	2868.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

600 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.68	200.0	16.2	93900.0	0.00237	0.0925	18.2	0.00364	1.46222	3.35
125.0	53.03	191.0	14.9	81100.0	0.00250	0.0896	15.7	0.00353	1.45600	3.02
130.0	52.36	182.0	13.9	70600.0	0.00263	0.0866	13.9	0.00344	1.44953	2.78
135.0	51.66	174.0	13.2	61900.0	0.00277	0.0836	12.6	0.00336	1.44283	2.62
140.0	50.93	166.0	12.6	54600.0	0.00290	0.0806	11.6	0.00329	1.43590	2.50
145.0	50.18	159.0	12.0	48300.0	0.00304	0.0777	10.6	0.00321	1.42877	2.37
150.0	49.40	152.0	11.5	42900.0	0.00318	0.0747	9.73	0.00313	1.42144	2.27
155.0	48.61	146.0	11.0	38000.0	0.00333	0.0719	9.02	0.00304	1.41391	2.20
160.0	47.79	140.0	10.5	33700.0	0.00349	0.0690	8.36	0.00295	1.40617	2.13
165.0	46.94	134.0	10.0	29700.0	0.00367	0.0662	7.74	0.00286	1.39820	2.08
170.0	46.06	129.0	9.56	26200.0	0.00388	0.0635	7.17	0.00276	1.38998	2.03
175.0	45.15	123.0	9.11	22900.0	0.00411	0.0608	6.62	0.00266	1.38150	1.99
180.0	44.20	118.0	8.67	20000.0	0.00437	0.0581	6.11	0.00255	1.37270	1.95
185.0	43.22	112.0	8.23	17200.0	0.00468	0.0554	5.63	0.00244	1.36354	1.92
190.0	42.18	107.0	7.81	14700.0	0.00505	0.0527	5.17	0.00232	1.35396	1.90
200.0	39.91	95.0	6.96	10300.0	0.00606	0.0474	4.32	0.00206	1.33319	1.89
205.0	38.65	88.7	6.53	8340.0	0.00680	0.0448	3.92	0.00192	1.32172	1.90
210.0	37.27	81.9	6.09	6520.0	0.00782	0.0421	3.52	0.00176	1.30921	1.93
215.0	35.72	74.5	5.63	4840.0	0.00934	0.0395	3.13	0.00159	1.29521	1.99
220.0	33.89	66.2	5.12	3300.0	0.0119	0.0369	2.73	0.00138	1.27888	2.10
225.0	31.56	56.4	4.53	1890.0	0.0173	0.0345	2.31	0.00112	1.25826	2.35
230.0	27.96	44.1	3.74	687.0	0.0359	0.0324	1.80	0.000730	1.22671	3.17
235.0	19.67	32.8	2.76	139.0	0.0981	0.0278	1.13	0.000438	1.15617	4.71
240.0	13.79	33.3	2.61	189.0	0.0460	0.0198	0.914	0.000939	1.10778	2.54
245.0	11.60	35.7	2.59	260.0	0.0267	0.0165	0.865	0.00150	1.09015	1.80
250.0	10.37	38.2	2.58	311.0	0.0192	0.0149	0.846	0.00197	1.08031	1.49
255.0	9.523	40.5	2.57	349.0	0.0152	0.0139	0.838	0.00238	1.07360	1.33
260.0	8.885	42.7	2.57	379.0	0.0127	0.0133	0.834	0.00275	1.06855	1.23
265.0	8.374	44.9	2.56	403.0	0.0110	0.0129	0.834	0.00310	1.06452	1.16
270.0	7.950	46.9	2.55	423.0	0.00980	0.0126	0.836	0.00344	1.06118	1.10
275.0	7.583	48.9	2.54	440.0	0.00885	0.0123	0.840	0.00376	1.05834	1.06
280.0	7.274	50.8	2.54	454.0	0.00810	0.0122	0.844	0.00407	1.05588	1.03
285.0	6.997	52.7	2.53	467.0	0.00748	0.0121	0.850	0.00438	1.05371	1.00
290.0	6.748	54.5	2.52	478.0	0.00697	0.0120	0.856	0.00469	1.05177	0.973
295.0	6.525	56.4	2.52	487.0	0.00654	0.0120	0.862	0.00499	1.05002	0.952
300.0	6.321	58.1	2.51	496.0	0.00616	0.0120	0.869	0.00530	1.04843	0.934
310.0	5.962	61.6	2.50	511.0	0.00555	0.0120	0.883	0.00591	1.04563	0.903
320.0	5.654	65.0	2.48	523.0	0.00507	0.0121	0.899	0.00651	1.04324	0.879
330.0	5.385	68.4	2.47	533.0	0.00468	0.0123	0.915	0.00712	1.04116	0.859
340.0	5.148	71.6	2.46	542.0	0.00436	0.0124	0.931	0.00773	1.03931	0.843
350.0	4.935	74.8	2.45	549.0	0.00408	0.0126	0.948	0.00834	1.03767	0.829
360.0	4.743	78.0	2.44	555.0	0.00385	0.0127	0.965	0.00895	1.03619	0.818
370.0	4.569	81.1	2.43	561.0	0.00364	0.0129	0.982	0.00957	1.03484	0.809
380.0	4.410	84.2	2.42	566.0	0.00345	0.0131	1.00	0.0102	1.03361	0.800
390.0	4.263	87.2	2.41	570.0	0.00330	0.0133	1.02	0.0108	1.03248	0.793
400.0	4.128	90.3	2.41	574.0	0.00316	0.0135	1.03	0.0115	1.03144	0.787
410.0	4.003	93.3	2.40	577.0	0.00303	0.0137	1.05	0.0121	1.03047	0.782
420.0	3.886	96.2	2.39	580.0	0.00291	0.0139	1.07	0.0127	1.02957	0.777
430.0	3.776	99.2	2.38	583.0	0.00280	0.0140	1.09	0.0134	1.02873	0.773
440.0	3.674	102.0	2.38	585.0	0.00270	0.0142	1.10	0.0141	1.02794	0.769
450.0	3.578	105.0	2.37	587.0	0.00261	0.0144	1.12	0.0147	1.02720	0.766
460.0	3.487	108.0	2.36	589.0	0.00253	0.0146	1.14	0.0154	1.02651	0.763
470.0	3.401	111.0	2.36	591.0	0.00245	0.0148	1.15	0.0161	1.02585	0.760
480.0	3.320	114.0	2.35	593.0	0.00238	0.0150	1.17	0.0168	1.02523	0.757
490.0	3.243	116.0	2.35	594.0	0.00231	0.0152	1.19	0.0175	1.02464	0.755
500.0	3.170	119.0	2.34	596.0	0.00225	0.0154	1.20	0.0182	1.02408	0.753
510.0	3.101	122.0	2.34	597.0	0.00219	0.0156	1.22	0.0189	1.02355	0.751
520.0	3.035	125.0	2.33	598.0	0.00213	0.0158	1.24	0.0196	1.02304	0.749
530.0	2.971	128.0	2.33	599.0	0.00208	0.0160	1.25	0.0203	1.02256	0.747
540.0	2.911	130.0	2.32	600.0	0.00203	0.0162	1.27	0.0211	1.02210	0.746
550.0	2.853	133.0	2.32	601.0	0.00199	0.0164	1.29	0.0218	1.02165	0.744
560.0	2.798	136.0	2.32	602.0	0.00193	0.0166	1.30	0.0226	1.02123	0.743
570.0	2.745	139.0	2.31	603.0	0.00189	0.0168	1.32	0.0233	1.02083	0.741
580.0	2.694	141.0	2.31	603.0	0.00185	0.0170	1.33	0.0241	1.02044	0.740
590.0	2.645	144.0	2.31	604.0	0.00181	0.0172	1.35	0.0249	1.02006	0.739
600.0	2.598	147.0	2.30	605.0	0.00177	0.0174	1.37	0.0257	1.01971	0.738
700.0	2.210	174.0	2.27	608.0	0.00148	0.0193	1.52	0.0339	1.01674	0.729
800.0	1.927	201.0	2.23	610.0	0.00127	0.0212	1.66	0.0429	1.01459	0.724
900.0	1.710	229.0	2.20	611.0	0.00112	0.0231	1.80	0.0525	1.01294	0.720
1000.0	1.539	258.0	2.16	611.0	0.00100	0.0249	1.92	0.0627	1.01163	0.718
1500.0	1.028	410.0	1.97	610.0	0.000661					
2000.0	0.7730	574.0	1.83	608.0	0.000495					
2500.0	0.6197	742.0	1.74	607.0	0.000396					
3000.0	0.5173	909.0	1.69	606.0	0.000330					
3500.0	0.4440	1080.0	1.65	605.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

620 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01862	1750.0	222.0	-62.30	-60.16	0.6007	0.2559	0.4728	3875.0
125.0	0.01885	1530.0	203.0	-59.94	-57.78	0.6201	0.2572	0.4776	3631.0
130.0	0.01903	1350.0	186.0	-57.58	-55.39	0.6383	0.2553	0.4798	3432.0
135.0	0.01935	1200.0	171.0	-55.21	-52.98	0.6570	0.2518	0.4807	3261.0
140.0	0.01963	1080.0	159.0	-52.83	-50.58	0.6745	0.2479	0.4813	3111.0
145.0	0.01992	967.0	147.0	-50.46	-48.17	0.6914	0.2441	0.4821	2974.0
150.0	0.02023	871.0	136.0	-48.08	-45.76	0.7078	0.2406	0.4834	2848.0
155.0	0.02056	785.0	127.0	-45.70	-43.34	0.7237	0.2375	0.4856	2728.0
160.0	0.02091	708.0	118.0	-43.30	-40.90	0.7391	0.2348	0.4888	2613.0
165.0	0.02129	637.0	109.0	-40.89	-38.45	0.7542	0.2326	0.4931	2502.0
170.0	0.02169	572.0	102.0	-38.46	-35.97	0.7690	0.2308	0.4987	2394.0
175.0	0.02213	512.0	94.4	-36.00	-33.46	0.7836	0.2292	0.5057	2287.0
180.0	0.02260	455.0	87.5	-33.50	-30.91	0.7979	0.2279	0.5143	2182.0
185.0	0.02311	403.0	81.0	-30.96	-28.31	0.8122	0.2269	0.5247	2077.0
190.0	0.02368	353.0	74.7	-28.38	-25.66	0.8263	0.2260	0.5375	1973.0
200.0	0.02501	262.0	62.8	-22.99	-20.12	0.8547	0.2248	0.5731	1760.0
205.0	0.02581	220.0	57.1	-20.15	-17.19	0.8692	0.2245	0.5990	1649.0
210.0	0.02675	180.0	51.4	-17.18	-14.11	0.8840	0.2245	0.6342	1533.0
215.0	0.02783	141.0	45.8	-14.02	-10.82	0.8995	0.2249	0.6858	1409.0
220.0	0.02933	103.0	39.9	-10.57	-7.211	0.9161	0.2259	0.7692	1272.0
225.0	0.03136	65.8	33.6	-6.615	-3.014	0.9350	0.2282	0.9299	1115.0
230.0	0.03487	31.2	26.1	-1.497	2.505	0.9593	0.2337	1.365	919.2
235.0	0.04507	9.17	16.2	7.439	12.61	1.003	0.2477	2.789	691.6
240.0	0.06503	11.8	10.0	17.44	24.91	1.055	0.2454	1.829	638.8
245.0	0.07972	20.0	7.66	22.69	31.85	1.083	0.2338	1.078	654.3
250.0	0.09041	27.8	6.47	26.06	36.44	1.102	0.2250	0.7956	674.3
255.0	0.09915	34.6	5.70	28.64	40.03	1.116	0.2183	0.6549	693.5
260.0	0.1068	40.8	5.15	30.82	43.08	1.128	0.2132	0.5710	711.3
265.0	0.1137	46.4	4.73	32.73	45.78	1.138	0.2090	0.5151	727.9
270.0	0.1200	51.6	4.40	34.47	48.25	1.147	0.2055	0.4752	743.5
275.0	0.1260	56.5	4.12	36.09	50.55	1.156	0.2027	0.4451	758.1
280.0	0.1316	61.1	3.88	37.61	52.72	1.164	0.2002	0.4218	772.0
285.0	0.1370	65.4	3.68	39.05	54.78	1.171	0.1981	0.4030	785.2
290.0	0.1422	69.6	3.50	40.43	56.75	1.178	0.1963	0.3877	797.9
295.0	0.1472	73.6	3.35	41.76	58.66	1.184	0.1947	0.3749	810.1
300.0	0.1520	77.4	3.21	43.05	60.50	1.190	0.1934	0.3640	821.8
310.0	0.1614	84.7	2.97	45.53	64.05	1.202	0.1911	0.3467	844.1
320.0	0.1703	91.7	2.77	47.90	67.45	1.213	0.1892	0.3334	865.0
330.0	0.1790	98.2	2.61	50.19	70.73	1.223	0.1878	0.3230	884.9
340.0	0.1873	105.0	2.46	52.41	73.92	1.232	0.1866	0.3146	903.8
350.0	0.1955	111.0	2.34	54.59	77.03	1.241	0.1856	0.3077	922.0
360.0	0.2035	117.0	2.22	56.72	80.08	1.250	0.1848	0.3020	939.4
370.0	0.2113	122.0	2.13	58.81	83.07	1.258	0.1841	0.2971	956.2
380.0	0.2190	128.0	2.04	60.88	86.02	1.266	0.1835	0.2929	972.5
390.0	0.2266	133.0	1.96	62.92	88.93	1.274	0.1829	0.2893	988.3
400.0	0.2341	139.0	1.88	64.94	91.81	1.281	0.1825	0.2862	1004.0
410.0	0.2415	144.0	1.81	66.93	94.66	1.288	0.1821	0.2834	1019.0
420.0	0.2488	149.0	1.75	68.92	97.48	1.295	0.1818	0.2810	1033.0
430.0	0.2560	154.0	1.69	70.88	100.3	1.301	0.1815	0.2788	1047.0
440.0	0.2632	159.0	1.64	72.84	103.1	1.308	0.1812	0.2768	1061.0
450.0	0.2703	164.0	1.59	74.78	105.8	1.314	0.1810	0.2751	1075.0
460.0	0.2774	169.0	1.55	76.71	108.6	1.320	0.1808	0.2735	1088.0
470.0	0.2844	174.0	1.50	78.63	111.3	1.326	0.1806	0.2720	1101.0
480.0	0.2914	179.0	1.46	80.55	114.0	1.332	0.1804	0.2707	1114.0
490.0	0.2983	183.0	1.42	82.45	116.7	1.337	0.1803	0.2695	1127.0
500.0	0.3052	188.0	1.39	84.35	119.4	1.343	0.1802	0.2684	1139.0
510.0	0.3121	193.0	1.35	86.24	122.1	1.348	0.1800	0.2674	1151.0
520.0	0.3189	197.0	1.32	88.13	124.7	1.353	0.1799	0.2665	1163.0
530.0	0.3257	202.0	1.29	90.01	127.4	1.358	0.1798	0.2657	1175.0
540.0	0.3324	206.0	1.26	91.88	130.1	1.363	0.1798	0.2649	1187.0
550.0	0.3392	211.0	1.23	93.75	132.7	1.368	0.1797	0.2641	1198.0
560.0	0.3459	215.0	1.21	95.62	135.3	1.373	0.1796	0.2635	1209.0
570.0	0.3526	220.0	1.18	97.48	133.0	1.377	0.1796	0.2628	1220.0
580.0	0.3593	224.0	1.16	99.34	140.6	1.382	0.1795	0.2623	1231.0
590.0	0.3659	228.0	1.13	101.2	143.2	1.386	0.1795	0.2617	1242.0
600.0	0.3725	233.0	1.11	103.1	145.8	1.391	0.1795	0.2612	1253.0
700.0	0.4380	276.0	0.931	121.5	171.4	1.431	0.1796	0.2579	1354.0
800.0	0.5024	317.0	0.804	139.8	197.5	1.465	0.1805	0.2568	1445.0
900.0	0.5661	358.0	0.708	158.2	223.2	1.495	0.1821	0.2570	1529.0
1000.0	0.6294	398.0	0.633	176.7	248.9	1.523	0.1843	0.2582	1607.0
1500.0	0.9422	594.0	0.416	272.8	381.0	1.629	0.1991	0.2711	1935.0
2000.0	1.253	787.0	0.311	376.2	520.0	1.709	0.2128	0.2842	2207.0
2500.0	1.562	979.0	0.248	485.3	664.6	1.774	0.2227	0.2938	2447.0
3000.0	1.871	1170.0	0.207	598.4	813.3	1.828	0.2294	0.3004	2666.0
3500.0	2.180	1360.0	0.177	714.4	964.7	1.875	0.2342	0.3051	2868.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

620 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.69	200.0	16.2	94200.0	0.00236	0.0926	18.2	0.00365	1.46233	3.35
125.0	53.05	192.0	14.9	81300.0	0.00243	0.0896	15.8	0.00354	1.45612	3.02
130.0	52.37	183.0	13.9	70800.0	0.00263	0.0866	14.0	0.00345	1.44967	2.78
135.0	51.67	174.0	13.2	62100.0	0.00276	0.0837	12.7	0.00337	1.44298	2.62
140.0	50.95	166.0	12.6	54800.0	0.00283	0.0807	11.6	0.00329	1.43608	2.50
145.0	50.20	159.0	12.0	48500.0	0.00303	0.0777	10.6	0.00321	1.42897	2.38
150.0	49.43	153.0	11.5	43000.0	0.00317	0.0748	9.75	0.00313	1.42166	2.27
155.0	48.63	146.0	11.0	38200.0	0.00332	0.0720	9.05	0.00305	1.41415	2.20
160.0	47.81	140.0	10.5	33900.0	0.00348	0.0691	8.39	0.00296	1.40643	2.13
165.0	46.97	135.0	10.0	29300.0	0.00366	0.0663	7.77	0.00286	1.39849	2.08
170.0	46.10	129.0	9.56	26400.0	0.00386	0.0636	7.19	0.00277	1.39031	2.03
175.0	45.19	124.0	9.12	23100.0	0.00403	0.0609	6.64	0.00266	1.38186	1.99
180.0	44.25	118.0	8.68	20200.0	0.00434	0.0562	6.13	0.00256	1.37311	1.95
185.0	43.27	113.0	8.25	17400.0	0.00465	0.0555	5.65	0.00245	1.36400	1.92
190.0	42.24	107.0	7.83	14900.0	0.00501	0.0529	5.20	0.00233	1.35449	1.90
200.0	39.99	95.7	6.99	10500.0	0.00593	0.0476	4.35	0.00208	1.33389	1.88
205.0	38.75	89.5	6.56	8530.0	0.00663	0.0450	3.96	0.00194	1.32255	1.89
210.0	37.39	82.8	6.13	6720.0	0.00766	0.0423	3.56	0.00179	1.31022	1.92
215.0	35.86	75.6	5.67	5040.0	0.00907	0.0397	3.17	0.00161	1.29651	1.97
220.0	34.09	67.5	5.18	3500.0	0.0114	0.0372	2.78	0.00142	1.28067	2.07
225.0	31.88	58.1	4.61	2100.0	0.0160	0.0348	2.36	0.00117	1.26108	2.27
230.0	28.68	46.8	3.90	395.0	0.0292	0.0326	1.83	0.000833	1.23297	2.84
235.0	22.19	34.9	2.95	203.0	0.0798	0.0293	1.27	0.000473	1.17731	4.37
240.0	15.37	33.3	2.64	182.0	0.9549	0.0218	0.963	0.000776	1.12063	2.91
245.0	12.54	35.4	2.61	251.0	0.0305	0.0177	0.890	0.00131	1.09774	1.95
250.0	11.06	37.8	2.60	307.0	0.0211	0.0157	0.863	0.00178	1.08585	1.58
255.0	10.08	40.1	2.59	349.0	0.0163	0.0145	0.851	0.00219	1.07806	1.38
260.0	9.364	42.3	2.58	382.0	0.0135	0.0137	0.845	0.00257	1.07235	1.27
265.0	8.797	44.4	2.57	408.0	0.0116	0.0132	0.844	0.00292	1.06786	1.18
270.0	8.332	46.5	2.57	430.0	0.0102	0.0128	0.845	0.00324	1.06419	1.13
275.0	7.938	48.5	2.56	448.0	0.00918	0.0126	0.848	0.00356	1.06109	1.08
280.0	7.598	50.4	2.55	464.0	0.00836	0.0124	0.851	0.00387	1.05842	1.04
285.0	7.299	52.3	2.54	478.0	0.00770	0.0123	0.856	0.00418	1.05608	1.01
290.0	7.033	54.2	2.54	489.0	0.00716	0.0122	0.862	0.00448	1.05399	0.985
295.0	6.794	56.0	2.53	500.0	0.00669	0.0122	0.868	0.00477	1.05212	0.963
300.0	6.577	57.8	2.52	509.0	0.00630	0.0121	0.874	0.00507	1.05043	0.943
310.0	6.197	61.3	2.51	525.0	0.00566	0.0122	0.888	0.00567	1.04746	0.911
320.0	5.871	64.7	2.50	538.0	0.00515	0.0123	0.903	0.00626	1.04493	0.885
330.0	5.588	68.1	2.48	549.0	0.00475	0.0124	0.919	0.00685	1.04273	0.864
340.0	5.338	71.3	2.47	558.0	0.00441	0.0125	0.935	0.00745	1.04079	0.847
350.0	5.115	74.6	2.46	566.0	0.00413	0.0127	0.952	0.00804	1.03906	0.833
360.0	4.915	77.7	2.45	573.0	0.00388	0.0128	0.969	0.00864	1.03751	0.821
370.0	4.733	80.9	2.44	579.0	0.00367	0.0130	0.986	0.00924	1.03610	0.811
380.0	4.566	84.0	2.43	584.0	0.00349	0.0132	1.00	0.00985	1.03482	0.803
390.0	4.413	87.0	2.42	588.0	0.00332	0.0134	1.02	0.0105	1.03364	0.796
400.0	4.272	90.1	2.41	592.0	0.00318	0.0135	1.04	0.0111	1.03255	0.789
410.0	4.141	93.1	2.41	596.0	0.00304	0.0137	1.05	0.0117	1.03154	0.784
420.0	4.020	96.1	2.40	599.0	0.00292	0.0139	1.07	0.0123	1.03060	0.779
430.0	3.906	99.0	2.39	602.0	0.00282	0.0141	1.09	0.0130	1.02973	0.774 *
440.0	3.799	102.0	2.38	605.0	0.00272	0.0143	1.11	0.0136	1.02891	0.770
450.0	3.699	105.0	2.38	607.0	0.00262	0.0145	1.12	0.0142	1.02814	0.767
460.0	3.605	108.0	2.37	609.0	0.00254	0.0147	1.14	0.0149	1.02742	0.764
470.0	3.516	111.0	2.37	611.0	0.00246	0.0149	1.16	0.0156	1.02673	0.761
480.0	3.432	113.0	2.36	613.0	0.00239	0.0151	1.17	0.0162	1.02609	0.758
490.0	3.352	116.0	2.35	614.0	0.00232	0.0153	1.19	0.0169	1.02548	0.756
500.0	3.277	119.0	2.35	616.0	0.00225	0.0155	1.21	0.0176	1.02490	0.754
510.0	3.205	122.0	2.34	617.0	0.00219	0.0157	1.22	0.0183	1.02434	0.751
520.0	3.136	125.0	2.34	618.0	0.00214	0.0159	1.24	0.0190	1.02382	0.750
530.0	3.071	128.0	2.34	619.0	0.00208	0.0161	1.26	0.0197	1.02332	0.748
540.0	3.008	130.0	2.33	620.0	0.00203	0.0163	1.27	0.0204	1.02284	0.746
550.0	2.948	133.0	2.33	621.0	0.00198	0.0165	1.29	0.0211	1.02238	0.745
560.0	2.891	136.0	2.32	622.0	0.00194	0.0167	1.30	0.0219	1.02194	0.743
570.0	2.836	139.0	2.32	623.0	0.00190	0.0168	1.32	0.0226	1.02152	0.742
580.0	2.784	141.0	2.31	624.0	0.00185	0.0170	1.34	0.0233	1.02112	0.741
590.0	2.733	144.0	2.31	624.0	0.00182	0.0172	1.35	0.0241	1.02073	0.739
600.0	2.684	147.0	2.31	625.0	0.00178	0.0174	1.37	0.0249	1.02036	0.738
700.0	2.283	174.0	2.27	629.0	0.00143	0.0193	1.52	0.0328	1.01730	0.729
800.0	1.990	202.0	2.24	631.0	0.00127	0.0212	1.66	0.0415	1.01507	0.724
900.0	1.766	229.0	2.20	632.0	0.00112	0.0231	1.80	0.0508	1.01336	0.720
1000.0	1.589	256.0	2.16	632.0	0.00100	0.0249	1.93	0.0608	1.01202	0.718
1500.0	1.061	410.0	1.97	630.0	0.000660					
2000.0	0.7934	574.0	1.83	628.0	0.000495					
2500.0	0.6402	742.0	1.74	627.0	0.000396					
3000.0	0.5344	910.0	1.69	626.0	0.000330					
3500.0	0.4587	1080.0	1.65	625.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

640 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01862	1760.0	222.0	-62.32	-60.11	0.6005	0.2563	0.4726	3874.0
125.0	0.01885	1540.0	203.0	-59.97	-57.73	0.6199	0.2577	0.4773	3631.0
130.0	0.01909	1360.0	186.0	-57.60	-55.34	0.6387	0.2557	0.4795	3433.0
135.0	0.01935	1210.0	172.0	-55.23	-52.94	0.6568	0.2522	0.4804	3263.0
140.0	0.01962	1080.0	159.0	-52.86	-50.54	0.6743	0.2482	0.4809	3113.0
145.0	0.01991	970.0	147.0	-50.49	-48.13	0.6912	0.2444	0.4817	2977.0
150.0	0.02022	874.0	137.0	-48.12	-45.72	0.7075	0.2408	0.4830	2850.0
155.0	0.02055	789.0	127.0	-45.73	-43.30	0.7234	0.2377	0.4851	2731.0
160.0	0.02090	712.0	118.0	-43.34	-40.87	0.7389	0.2351	0.4882	2617.0
165.0	0.02128	641.0	110.0	-40.94	-38.42	0.7539	0.2328	0.4924	2506.0
170.0	0.02168	576.0	102.0	-38.51	-35.94	0.7687	0.2309	0.4979	2398.0
175.0	0.02211	516.0	94.7	-36.05	-33.43	0.7832	0.2294	0.5048	2293.0
180.0	0.02258	459.0	87.8	-33.57	-30.89	0.7976	0.2281	0.5132	2188.0
185.0	0.02309	407.0	81.2	-31.04	-28.30	0.8118	0.2270	0.5234	2084.0
190.0	0.02365	357.0	75.0	-28.45	-25.65	0.8259	0.2261	0.5358	1980.0
200.0	0.02495	266.0	63.2	-23.09	-20.13	0.8542	0.2249	0.5702	1769.0
205.0	0.02575	224.0	57.5	-20.28	-17.22	0.8686	0.2246	0.5950	1660.0
210.0	0.02667	184.0	51.9	-17.33	-14.17	0.8833	0.2245	0.6284	1546.0
215.0	0.02778	145.0	46.3	-14.21	-10.92	0.8986	0.2248	0.6765	1424.0
220.0	0.02917	108.0	40.5	-10.82	-7.369	0.9149	0.2257	0.7524	1291.0
225.0	0.03108	71.6	34.4	-6.984	-3.300	0.9332	0.2277	0.8912	1140.0
230.0	0.03418	37.6	27.4	-2.207	1.842	0.9558	0.2321	1.223	957.9
235.0	0.04159	12.8	18.5	5.223	10.15	0.9915	0.2432	2.259	742.2
240.0	0.05836	11.0	11.4	15.04	21.96	1.041	0.2472	2.046	650.1
245.0	0.07354	18.0	8.49	21.15	29.87	1.074	0.2367	1.220	655.6
250.0	0.08467	25.7	7.04	24.93	34.97	1.095	0.2275	0.8683	673.8
255.0	0.09364	32.7	6.14	27.74	38.84	1.110	0.2204	0.6986	692.5
260.0	0.1014	39.0	5.51	30.06	42.07	1.122	0.2149	0.6003	710.3
265.0	0.1083	44.7	5.04	32.07	44.90	1.133	0.2104	0.5364	726.9
270.0	0.1146	50.1	4.66	33.88	47.46	1.143	0.2068	0.4915	742.6
275.0	0.1205	55.1	4.35	35.55	49.83	1.151	0.2037	0.4581	757.4
280.0	0.1261	59.7	4.09	37.11	52.06	1.159	0.2012	0.4324	771.4
285.0	0.1314	64.2	3.87	38.59	54.17	1.167	0.1990	0.4119	784.7
290.0	0.1366	68.4	3.68	40.00	56.18	1.174	0.1971	0.3953	797.5
295.0	0.1415	72.5	3.51	41.36	58.12	1.181	0.1954	0.3814	809.8
300.0	0.1463	76.4	3.36	42.67	60.00	1.187	0.1940	0.3698	821.6
310.0	0.1554	83.8	3.11	45.18	63.60	1.199	0.1916	0.3512	844.0
320.0	0.1642	90.9	2.90	47.58	67.04	1.210	0.1897	0.3372	865.1
330.0	0.1726	97.5	2.72	49.90	70.36	1.220	0.1881	0.3262	885.1
340.0	0.1808	104.0	2.57	52.14	73.57	1.229	0.1869	0.3173	904.1
350.0	0.1888	110.0	2.43	54.33	76.71	1.239	0.1859	0.3100	922.4
360.0	0.1966	116.0	2.32	56.48	79.78	1.247	0.1850	0.3040	939.3
370.0	0.2042	122.0	2.21	58.59	82.79	1.255	0.1843	0.2989	956.8
380.0	0.2117	127.0	2.12	60.66	85.76	1.263	0.1837	0.2945	973.1
390.0	0.2191	133.0	2.03	62.71	88.68	1.271	0.1831	0.2908	989.0
400.0	0.2264	138.0	1.95	64.74	91.57	1.278	0.1827	0.2875	1004.0
410.0	0.2336	144.0	1.88	66.75	94.44	1.285	0.1823	0.2846	1019.0
420.0	0.2407	149.0	1.82	68.74	97.27	1.292	0.1819	0.2821	1034.0
430.0	0.2478	154.0	1.76	70.71	100.1	1.299	0.1816	0.2798	1048.0
440.0	0.2548	159.0	1.70	72.67	102.9	1.305	0.1813	0.2778	1062.0
450.0	0.2617	164.0	1.65	74.62	105.6	1.311	0.1811	0.2760	1076.0
460.0	0.2686	169.0	1.60	76.56	108.4	1.317	0.1809	0.2743	1089.0
470.0	0.2754	174.0	1.56	78.48	111.1	1.323	0.1807	0.2728	1102.0
480.0	0.2822	178.0	1.51	80.40	113.8	1.329	0.1805	0.2715	1115.0
490.0	0.2889	183.0	1.47	82.31	116.5	1.335	0.1804	0.2702	1128.0
500.0	0.2956	188.0	1.44	84.21	119.2	1.340	0.1802	0.2691	1140.0
510.0	0.3023	193.0	1.40	86.11	121.9	1.345	0.1801	0.2680	1152.0
520.0	0.3089	197.0	1.37	88.00	124.6	1.351	0.1800	0.2671	1164.0
530.0	0.3155	202.0	1.33	89.88	127.3	1.356	0.1799	0.2662	1176.0
540.0	0.3221	206.0	1.30	91.76	129.9	1.361	0.1798	0.2654	1188.0
550.0	0.3286	211.0	1.28	93.64	132.6	1.366	0.1798	0.2646	1199.0
560.0	0.3351	215.0	1.25	95.51	135.2	1.370	0.1797	0.2639	1210.0
570.0	0.3416	220.0	1.22	97.37	137.9	1.375	0.1796	0.2633	1222.0
580.0	0.3481	224.0	1.20	99.24	140.5	1.380	0.1796	0.2627	1233.0
590.0	0.3546	229.0	1.17	101.1	143.1	1.384	0.1796	0.2622	1244.0
600.0	0.3610	233.0	1.15	103.0	145.7	1.388	0.1795	0.2616	1254.0
700.0	0.4245	276.0	0.963	121.4	171.7	1.428	0.1797	0.2582	1355.0
800.0	0.4870	317.0	0.831	139.7	197.4	1.463	0.1806	0.2570	1447.0
900.0	0.5488	358.0	0.732	158.1	223.1	1.493	0.1821	0.2572	1531.0
1000.0	0.6101	398.0	0.654	176.6	248.9	1.520	0.1843	0.2584	1608.0
1500.0	0.9132	595.0	0.430	272.8	381.0	1.627	0.1932	0.2711	1937.0
2000.0	1.214	788.0	0.321	376.1	520.0	1.707	0.2128	0.2842	2208.0
2500.0	1.514	980.0	0.256	485.2	664.7	1.772	0.2227	0.2938	2448.0
3000.0	1.813	1170.0	0.213	598.4	813.3	1.826	0.2294	0.3004	2667.0
3500.0	2.113	1360.0	0.183	714.4	964.8	1.872	0.2342	0.3051	2869.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

640 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial V)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.71	201.0	16.1	94400.0	0.00235	0.0927	18.3	0.00365	1.46244	3.36
125.0	53.06	192.0	14.8	81500.0	0.00249	0.0897	15.8	0.00354	1.45625	3.03
130.0	52.39	183.0	13.9	71000.0	0.00262	0.0867	14.0	0.00345	1.44981	2.79
135.0	51.69	175.0	13.2	62300.0	0.00275	0.0837	12.7	0.00337	1.44314	2.62
140.0	50.97	167.0	12.5	55000.0	0.00288	0.0808	11.7	0.00329	1.43626	2.50
145.0	50.22	160.0	12.0	48700.0	0.00302	0.0778	10.7	0.00322	1.42917	2.38
150.0	49.45	153.0	11.5	43200.0	0.00316	0.0749	9.78	0.00314	1.42188	2.27
155.0	48.66	147.0	11.0	38400.0	0.00331	0.0720	9.07	0.00305	1.41439	2.20
160.0	47.84	141.0	10.5	34000.0	0.00346	0.0692	8.41	0.00296	1.40670	2.13
165.0	47.00	135.0	10.0	30100.0	0.00364	0.0664	7.79	0.00287	1.39879	2.08
170.0	46.13	130.0	9.57	26600.0	0.00384	0.0637	7.21	0.00277	1.39064	2.03
175.0	45.23	124.0	9.12	23300.0	0.00406	0.0610	6.67	0.00267	1.38222	1.99
180.0	44.29	119.0	8.69	20300.0	0.00432	0.0583	6.16	0.00257	1.37351	1.95
185.0	43.32	113.0	8.26	17600.0	0.00461	0.0557	5.68	0.00246	1.36446	1.92
190.0	42.29	108.0	7.84	15100.0	0.00496	0.0530	5.22	0.00234	1.35501	1.90
200.0	40.07	96.4	7.01	10700.0	0.00592	0.0478	4.37	0.00209	1.33458	1.88
205.0	38.84	90.2	6.59	8720.0	0.00659	0.0452	3.97	0.00195	1.32337	1.88
210.0	37.50	83.7	6.16	6910.0	0.00751	0.0425	3.59	0.00181	1.31122	1.91
215.0	36.00	76.6	5.72	5240.0	0.00883	0.0400	3.20	0.00164	1.29776	1.95
220.0	34.28	68.7	5.23	3700.0	0.0109	0.0374	2.82	0.00145	1.28236	2.04
225.0	32.17	59.8	4.69	2310.0	0.0149	0.0351	2.41	0.00122	1.26365	2.21
230.0	29.26	49.2	4.03	1100.0	0.0249	0.0329	1.96	0.000919	1.23805	2.63
235.0	24.04	37.5	3.17	306.0	0.0602	0.0301	1.41	0.000555	1.19307	3.81
240.0	17.13	33.8	2.70	189.0	0.0606	0.0237	1.03	0.000677	1.13514	3.19
245.0	13.60	35.2	2.64	245.0	0.0347	0.0189	0.920	0.00114	1.10626	2.13
250.0	11.81	37.4	2.62	303.0	0.0232	0.0165	0.882	0.00161	1.09185	1.67
255.0	10.68	39.7	2.61	349.0	0.0176	0.0151	0.865	0.00202	1.08280	1.44
260.0	9.866	41.9	2.60	384.0	0.0143	0.0142	0.857	0.00240	1.07633	1.31
265.0	9.236	44.0	2.59	413.0	0.0122	0.0136	0.854	0.00274	1.07133	1.21
270.0	8.725	46.1	2.58	437.0	0.0107	0.0131	0.854	0.00307	1.06729	1.15
275.0	8.297	48.1	2.57	457.0	0.00953	0.0128	0.856	0.00338	1.06391	1.10
280.0	7.929	50.0	2.57	474.0	0.00864	0.0126	0.859	0.00368	1.06102	1.06
285.0	7.608	52.0	2.56	488.0	0.00793	0.0125	0.863	0.00398	1.05850	1.03
290.0	7.323	53.8	2.55	501.0	0.00734	0.0124	0.868	0.00428	1.05626	1.00
295.0	7.068	55.7	2.54	512.0	0.00685	0.0123	0.874	0.00457	1.05427	0.974
300.0	6.837	57.5	2.54	522.0	0.00644	0.0123	0.880	0.00486	1.05246	0.953
310.0	6.434	61.0	2.52	539.0	0.00576	0.0123	0.893	0.00544	1.04931	0.919
320.0	6.090	64.4	2.51	553.0	0.00523	0.0124	0.908	0.00602	1.04663	0.891
330.0	5.792	67.8	2.49	565.0	0.00481	0.0125	0.923	0.00660	1.04432	0.869
340.0	5.530	71.1	2.48	575.0	0.00446	0.0126	0.939	0.00718	1.04228	0.851
350.0	5.297	74.3	2.47	583.0	0.00417	0.0127	0.956	0.00776	1.04047	0.837
360.0	5.087	77.5	2.46	590.0	0.00392	0.0129	0.972	0.00835	1.03884	0.824
370.0	4.896	80.6	2.45	596.0	0.00371	0.0131	0.989	0.00893	1.03737	0.814
380.0	4.723	83.8	2.44	602.0	0.00352	0.0132	1.01	0.00952	1.03603	0.805
390.0	4.564	86.8	2.43	607.0	0.00335	0.0134	1.02	0.0101	1.03480	0.798
400.0	4.417	89.9	2.42	611.0	0.00320	0.0136	1.04	0.0107	1.03366	0.791
410.0	4.281	92.9	2.41	615.0	0.00306	0.0138	1.06	0.0113	1.03261	0.785
420.0	4.154	95.9	2.41	618.0	0.00294	0.0140	1.07	0.0119	1.03164	0.780
430.0	4.036	98.9	2.40	621.0	0.00283	0.0142	1.09	0.0125	1.03073	0.776
440.0	3.925	102.0	2.39	624.0	0.00273	0.0144	1.11	0.0132	1.02988	0.772
450.0	3.821	105.0	2.39	626.0	0.00264	0.0146	1.13	0.0138	1.02908	0.768
460.0	3.724	108.0	2.38	629.0	0.00255	0.0147	1.14	0.0144	1.02833	0.765
470.0	3.631	111.0	2.37	631.0	0.00247	0.0149	1.16	0.0151	1.02762	0.762
480.0	3.544	113.0	2.37	632.0	0.00239	0.0151	1.18	0.0157	1.02695	0.759
490.0	3.461	116.0	2.36	634.0	0.00232	0.0153	1.19	0.0164	1.02631	0.757
500.0	3.383	119.0	2.36	636.0	0.00226	0.0155	1.21	0.0171	1.02571	0.754
510.0	3.309	122.0	2.35	637.0	0.00220	0.0157	1.23	0.0177	1.02514	0.752
520.0	3.237	125.0	2.35	638.0	0.00214	0.0159	1.24	0.0184	1.02460	0.750
530.0	3.170	128.0	2.34	640.0	0.00209	0.0161	1.26	0.0191	1.02408	0.748
540.0	3.105	130.0	2.34	641.0	0.00204	0.0163	1.27	0.0198	1.02358	0.747
550.0	3.043	133.0	2.33	642.0	0.00199	0.0165	1.29	0.0205	1.02311	0.745
560.0	2.984	136.0	2.33	642.0	0.00194	0.0167	1.31	0.0212	1.02265	0.744
570.0	2.927	139.0	2.32	643.0	0.00190	0.0169	1.32	0.0219	1.02222	0.742
580.0	2.873	141.0	2.32	644.0	0.00186	0.0171	1.34	0.0226	1.02180	0.741
590.0	2.820	144.0	2.32	645.0	0.00182	0.0173	1.35	0.0234	1.02140	0.740
600.0	2.770	147.0	2.31	645.0	0.00178	0.0175	1.37	0.0241	1.02102	0.739
700.0	2.356	174.0	2.28	650.0	0.00148	0.0194	1.52	0.0319	1.01785	0.730
800.0	2.053	202.0	2.24	652.0	0.00127	0.0212	1.66	0.0403	1.01555	0.724
900.0	1.822	229.0	2.20	653.0	0.00112	0.0231	1.80	0.0493	1.01379	0.720
1000.0	1.639	258.0	2.17	653.0	0.00100	0.0250	1.93	0.0589	1.01240	0.718
1500.0	1.095	411.0	1.97	651.0	0.000660					
2000.0	0.8238	575.0	1.83	649.0	0.000495					
2500.0	0.6606	742.0	1.74	647.0	0.000396					
3000.0	0.5515	910.0	1.69	646.0	0.000330					
3500.0	0.4733	1080.0	1.65	645.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

660 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01862	1760.0	222.0	-62.33	-60.06	0.5004	0.2568	0.4723	3874.0
125.0	0.01884	1540.0	203.0	-59.99	-57.68	0.6198	0.2561	0.4771	3632.0
130.0	0.01909	1360.0	186.0	-57.63	-55.29	0.6385	0.2561	0.4792	3433.0
135.0	0.01934	1210.0	172.0	-55.26	-52.89	0.6566	0.2526	0.4800	3264.0
140.0	0.01961	1080.0	159.0	-52.89	-50.49	0.6741	0.2486	0.4806	3115.0
145.0	0.01990	974.0	147.0	-50.52	-48.09	0.6910	0.2447	0.4813	2979.0
150.0	0.02021	878.0	137.0	-48.15	-45.68	0.7073	0.2411	0.4825	2853.0
155.0	0.02054	792.0	127.0	-45.77	-43.26	0.7232	0.2380	0.4846	2734.0
160.0	0.02089	715.0	118.0	-43.38	-40.83	0.7386	0.2353	0.4875	2621.0
165.0	0.02125	645.0	110.0	-40.98	-38.38	0.7537	0.2330	0.4918	2511.0
170.0	0.02166	580.0	102.0	-38.56	-35.91	0.7684	0.2311	0.4971	2403.0
175.0	0.02209	519.0	94.9	-36.11	-33.41	0.7829	0.2296	0.5038	2298.0
180.0	0.02255	463.0	88.0	-33.63	-30.87	0.7972	0.2282	0.5121	2194.0
185.0	0.02305	410.0	81.5	-31.10	-28.29	0.8114	0.2271	0.5220	2091.0
190.0	0.02361	361.0	75.3	-28.53	-25.65	0.8255	0.2262	0.5341	1988.0
200.0	0.02491	271.0	63.5	-23.20	-20.15	0.8536	0.2249	0.5674	1779.0
205.0	0.02563	229.0	57.9	-20.40	-17.26	0.8679	0.2246	0.5912	1671.0
210.0	0.02653	189.0	52.3	-17.48	-14.23	0.8825	0.2245	0.6229	1558.0
215.0	0.02767	150.0	46.8	-14.39	-11.01	0.8977	0.2247	0.6679	1439.0
220.0	0.02902	113.0	41.1	-11.05	-7.516	0.9138	0.2255	0.7373	1309.0
225.0	0.03082	77.3	35.1	-7.325	-3.558	0.9316	0.2272	0.8587	1164.0
230.0	0.03361	43.7	28.5	-2.812	1.295	0.9529	0.2309	1.123	992.6
235.0	0.03940	17.4	20.4	3.631	8.446	0.9836	0.2395	1.856	791.2
240.0	0.05281	11.4	13.0	12.70	19.15	1.029	0.2472	2.100	668.8
245.0	0.06773	16.5	9.43	19.49	27.77	1.064	0.2393	1.365	659.5
250.0	0.07924	23.8	7.67	23.74	33.42	1.087	0.2299	0.9486	674.3
255.0	0.08842	30.8	6.61	26.80	37.61	1.104	0.2224	0.7465	692.1
260.0	0.09623	37.2	5.89	29.27	41.03	1.117	0.2166	0.6321	709.6
265.0	0.1032	43.1	5.36	31.39	44.00	1.128	0.2119	0.5592	726.3
270.0	0.1095	48.6	4.94	33.27	46.66	1.138	0.2080	0.5088	742.0
275.0	0.1154	53.7	4.60	35.00	49.11	1.147	0.2048	0.4718	756.8
280.0	0.1210	58.5	4.31	36.61	51.39	1.155	0.2021	0.4435	770.9
285.0	0.1262	63.0	4.07	38.12	53.55	1.163	0.1998	0.4212	784.3
290.0	0.1313	67.3	3.86	39.57	55.61	1.170	0.1978	0.4031	797.2
295.0	0.1361	71.4	3.68	40.95	57.59	1.177	0.1961	0.3882	809.5
300.0	0.1408	75.4	3.52	42.28	59.50	1.183	0.1946	0.3757	821.4
310.0	0.1498	83.0	3.25	44.84	63.15	1.195	0.1920	0.3559	844.0
320.0	0.1584	90.1	3.02	47.27	66.63	1.206	0.1901	0.3410	865.2
330.0	0.1667	96.8	2.83	49.60	69.98	1.217	0.1885	0.3293	885.3
340.0	0.1747	103.0	2.67	51.87	73.22	1.226	0.1872	0.3200	904.5
350.0	0.1825	110.0	2.53	54.08	76.39	1.236	0.1861	0.3124	922.8
360.0	0.1901	116.0	2.41	56.24	79.48	1.244	0.1852	0.3061	940.4
370.0	0.1976	121.0	2.30	58.36	82.51	1.253	0.1845	0.3007	957.4
380.0	0.2049	127.0	2.20	60.45	85.49	1.261	0.1838	0.2962	973.8
390.0	0.2121	133.0	2.11	62.51	88.44	1.268	0.1833	0.2922	989.7
400.0	0.2192	138.0	2.03	64.55	91.34	1.276	0.1828	0.2888	1005.0
410.0	0.2262	143.0	1.95	66.56	94.21	1.283	0.1824	0.2858	1020.0
420.0	0.2332	149.0	1.88	68.56	97.06	1.290	0.1821	0.2832	1035.0
430.0	0.2400	154.0	1.82	70.54	99.9	1.296	0.1817	0.2808	1049.0
440.0	0.2468	159.0	1.76	72.51	102.7	1.303	0.1815	0.2787	1063.0
450.0	0.2536	164.0	1.71	74.46	105.5	1.309	0.1812	0.2768	1077.0
460.0	0.2603	169.0	1.66	76.40	108.2	1.315	0.1810	0.2751	1090.0
470.0	0.2669	174.0	1.61	78.34	111.0	1.321	0.1808	0.2736	1103.0
480.0	0.2735	178.0	1.57	80.26	113.7	1.327	0.1806	0.2722	1116.0
490.0	0.2801	183.0	1.53	82.17	116.4	1.332	0.1805	0.2709	1129.0
500.0	0.2866	188.0	1.49	84.08	119.1	1.338	0.1803	0.2697	1141.0
510.0	0.2931	193.0	1.45	85.98	121.8	1.343	0.1802	0.2687	1153.0
520.0	0.2995	197.0	1.41	87.87	124.5	1.348	0.1801	0.2677	1165.0
530.0	0.3059	202.0	1.38	89.76	127.1	1.353	0.1800	0.2668	1177.0
540.0	0.3123	206.0	1.35	91.64	129.8	1.358	0.1799	0.2659	1189.0
550.0	0.3187	211.0	1.32	93.52	132.5	1.363	0.1798	0.2651	1200.0
560.0	0.3250	215.0	1.29	95.39	135.1	1.368	0.1798	0.2644	1212.0
570.0	0.3313	220.0	1.26	97.26	137.8	1.373	0.1797	0.2638	1223.0
580.0	0.3376	224.0	1.24	99.13	140.4	1.377	0.1797	0.2631	1234.0
590.0	0.3439	229.0	1.21	101.0	143.0	1.382	0.1796	0.2626	1245.0
600.0	0.3501	233.0	1.19	102.8	145.6	1.386	0.1796	0.2620	1256.0
700.0	0.4119	276.0	0.995	121.3	171.6	1.426	0.1797	0.2585	1357.0
800.0	0.4725	318.0	0.858	139.7	197.4	1.461	0.1806	0.2572	1448.0
900.0	0.5325	359.0	0.755	158.0	223.1	1.491	0.1822	0.2573	1532.0
1000.0	0.5920	399.0	0.675	176.6	248.9	1.518	0.1843	0.2585	1610.0
1500.0	0.8860	595.0	0.443	272.8	381.1	1.625	0.1992	0.2712	1938.0
2000.0	1.178	789.0	0.331	376.1	520.1	1.705	0.2128	0.2842	2209.0
2500.0	1.468	981.0	0.264	485.2	664.7	1.769	0.2227	0.2938	2449.0
3000.0	1.759	1170.0	0.220	598.4	813.4	1.824	0.2294	0.3005	2667.0
3500.0	2.049	1360.0	0.189	714.4	964.8	1.870	0.2342	0.3051	2870.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

660 PSIA 150BAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DU)$_V$ PSIA-CU FT/BTU	-V(DP/DV)$_T$ PSIA	(DV/DT)$_P$/V 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.72	201.0	16.1	94600.0	0.00235	0.0927	18.3	0.00365	1.46255	3.36
125.0	53.07	192.0	14.8	81700.0	0.00243	0.0897	15.9	0.00354	1.45637	3.03
130.0	52.40	184.0	13.9	71200.0	0.00251	0.0868	14.0	0.00346	1.44935	2.79
135.0	51.71	175.0	13.1	62600.0	0.00274	0.0833	12.7	0.00338	1.44330	2.62
140.0	50.98	167.0	12.5	55200.0	0.00287	0.0808	11.7	0.00330	1.43643	2.50
145.0	50.24	160.0	12.0	48900.0	0.00301	0.0779	10.7	0.00322	1.42936	2.38
150.0	49.47	153.0	11.5	43400.0	0.00315	0.0750	9.80	0.00314	1.42209	2.27
155.0	48.68	147.0	11.0	38600.0	0.00329	0.0721	9.09	0.00306	1.41463	2.20
160.0	47.87	141.0	10.5	34200.0	0.00345	0.0693	8.43	0.00297	1.40696	2.13
165.0	47.03	136.0	10.0	30300.0	0.00362	0.0665	7.81	0.00288	1.39908	2.08
170.0	46.16	130.0	9.57	26800.0	0.00382	0.0638	7.23	0.00278	1.39096	2.03
175.0	45.27	125.0	9.13	23500.0	0.00404	0.0611	6.69	0.00268	1.38259	1.99
180.0	44.34	119.0	8.70	20500.0	0.00429	0.0584	6.18	0.00257	1.37392	1.95
185.0	43.36	114.0	8.28	17800.0	0.00458	0.0558	5.70	0.00247	1.36491	1.92
190.0	42.35	109.0	7.86	15300.0	0.00492	0.0532	5.25	0.00235	1.35552	1.90
200.0	40.14	97.1	7.03	10900.0	0.00585	0.0480	4.40	0.00211	1.33527	1.87
205.0	38.92	91.0	6.62	8910.0	0.00650	0.0454	4.00	0.00197	1.32417	1.88
210.0	37.60	84.6	6.20	7100.0	0.00737	0.0428	3.62	0.00183	1.31219	1.90
215.0	36.14	77.6	5.76	5430.0	0.00861	0.0402	3.24	0.00166	1.29898	1.94
220.0	34.46	70.0	5.29	3900.0	0.0105	0.0377	2.86	0.00148	1.28397	2.01
225.0	32.44	61.3	4.77	2510.0	0.0140	0.0354	2.46	0.00127	1.26602	2.15
230.0	29.75	51.3	4.14	1300.0	0.0219	0.0332	2.03	0.000994	1.24235	2.48
235.0	25.38	40.2	3.36	443.0	0.0462	0.0307	1.53	0.000651	1.20451	3.33
240.0	18.34	34.7	2.78	215.0	0.0606	0.0253	1.10	0.000637	1.15005	3.30
245.0	14.76	35.2	2.67	243.0	0.0388	0.0203	0.955	0.00101	1.11572	2.32
250.0	12.62	37.1	2.64	330.0	0.0256	0.0174	0.904	0.00145	1.09836	1.78
255.0	11.31	39.3	2.63	348.0	0.0190	0.0157	0.891	0.00186	1.08784	1.51
260.0	10.39	41.5	2.62	387.0	0.0152	0.0147	0.870	0.00223	1.08050	1.35
265.0	9.692	43.7	2.61	418.0	0.0128	0.0140	0.865	0.00258	1.07494	1.25
270.0	9.131	45.7	2.60	444.0	0.0111	0.0135	0.863	0.00290	1.07050	1.17
275.0	8.665	47.7	2.59	465.0	0.00988	0.0131	0.864	0.00321	1.06681	1.12
280.0	8.268	49.7	2.58	483.0	0.00892	0.0123	0.866	0.00351	1.06368	1.08
285.0	7.922	51.6	2.57	499.0	0.00816	0.0127	0.870	0.00380	1.06097	1.04
290.0	7.618	53.5	2.56	513.0	0.00754	0.0126	0.874	0.00409	1.05858	1.01
295.0	7.346	55.3	2.56	525.0	0.00702	0.0125	0.880	0.00438	1.05644	0.985
300.0	7.101	57.1	2.55	536.0	0.00659	0.0124	0.885	0.00466	1.05452	0.963
310.0	6.674	60.7	2.53	554.0	0.00587	0.0124	0.898	0.00523	1.05118	0.926
320.0	6.311	64.1	2.52	568.0	0.00532	0.0125	0.913	0.00580	1.04836	0.898
330.0	5.998	67.5	2.51	581.0	0.00488	0.0126	0.928	0.00637	1.04592	0.875
340.0	5.723	70.8	2.49	591.0	0.00452	0.0127	0.943	0.00693	1.04378	0.856
350.0	5.479	74.1	2.48	600.0	0.00422	0.0128	0.959	0.00750	1.04188	0.840
360.0	5.259	77.3	2.47	608.0	0.00396	0.0130	0.976	0.00807	1.04018	0.828
370.0	5.061	80.4	2.46	614.0	0.00374	0.0132	0.992	0.00864	1.03864	0.817
380.0	4.880	83.6	2.45	620.0	0.00354	0.0133	1.01	0.00922	1.03724	0.808
390.0	4.714	86.6	2.44	625.0	0.00337	0.0135	1.03	0.00980	1.03596	0.800
400.0	4.561	89.7	2.43	630.0	0.00322	0.0137	1.04	0.0104	1.03478	0.793
410.0	4.420	92.7	2.42	634.0	0.00308	0.0139	1.06	0.0110	1.03369	0.787
420.0	4.288	95.7	2.41	637.0	0.00295	0.0140	1.08	0.0116	1.03267	0.782
430.0	4.166	98.7	2.41	640.0	0.00285	0.0142	1.09	0.0122	1.03173	0.777
440.0	4.051	102.0	2.40	643.0	0.00274	0.0144	1.11	0.0128	1.03085	0.773
450.0	3.943	105.0	2.39	646.0	0.00265	0.0146	1.13	0.0134	1.03002	0.769
460.0	3.842	107.0	2.39	648.0	0.00256	0.0148	1.14	0.0140	1.02924	0.766
470.0	3.747	110.0	2.38	650.0	0.00248	0.0150	1.16	0.0146	1.02850	0.763
480.0	3.656	113.0	2.37	652.0	0.00240	0.0152	1.18	0.0153	1.02781	0.760
490.0	3.571	116.0	2.37	654.0	0.00233	0.0154	1.19	0.0159	1.02715	0.757
500.0	3.490	119.0	2.36	656.0	0.00227	0.0156	1.21	0.0165	1.02653	0.755
510.0	3.412	122.0	2.36	657.0	0.00221	0.0158	1.23	0.0172	1.02594	0.753
520.0	3.339	125.0	2.35	658.0	0.00215	0.0160	1.24	0.0179	1.02537	0.751
530.0	3.269	127.0	2.35	660.0	0.00209	0.0162	1.26	0.0185	1.02484	0.749
540.0	3.202	130.0	2.34	661.0	0.00204	0.0164	1.28	0.0192	1.02432	0.747
550.0	3.138	133.0	2.34	662.0	0.00199	0.0165	1.29	0.0199	1.02383	0.746
560.0	3.077	136.0	2.33	663.0	0.00195	0.0167	1.31	0.0206	1.02336	0.744
570.0	3.018	139.0	2.33	664.0	0.00190	0.0169	1.32	0.0213	1.02292	0.743
580.0	2.962	141.0	2.32	665.0	0.00186	0.0171	1.34	0.0220	1.02249	0.741
590.0	2.908	144.0	2.32	665.0	0.00182	0.0173	1.35	0.0227	1.02207	0.740
600.0	2.856	147.0	2.32	666.0	0.00178	0.0175	1.37	0.0234	1.02167	0.739
700.0	2.428	174.0	2.28	671.0	0.00148	0.0194	1.52	0.0303	1.01840	0.730
800.0	2.116	202.0	2.24	673.0	0.00128	0.0213	1.66	0.0381	1.01603	0.724
900.0	1.878	229.0	2.21	673.0	0.00112	0.0231	1.80	0.0479	1.01421	0.721
1000.0	1.689	258.0	2.17	674.0	0.00100	0.0250	1.93	0.0572	1.01278	0.718
1500.0	1.129	411.0	1.97	672.0	0.000660					
2000.0	0.8491	575.0	1.83	670.0	0.000434					
2500.0	0.6810	742.0	1.74	668.0	0.000336					
3000.0	0.5685	910.0	1.69	667.0	0.000330					
3500.0	0.4880	1080.0	1.65	666.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

680 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01861	1760.0	222.0	-62.35	-60.01	0.6002	0.2572	0.4720	3873.0
125.0	0.01884	1540.0	203.0	-60.01	-57.64	0.6196	0.2585	0.4768	3632.0
130.0	0.01908	1360.0	186.0	-57.65	-55.25	0.6383	0.2565	0.4789	3434.0
135.0	0.01933	1210.0	172.0	-55.28	-52.85	0.6564	0.2529	0.4797	3265.0
140.0	0.01961	1090.0	159.0	-52.92	-50.45	0.6739	0.2489	0.4802	3116.0
145.0	0.01990	977.0	147.0	-50.55	-48.05	0.6907	0.2450	0.4809	2981.0
150.0	0.02020	881.0	137.0	-48.18	-45.64	0.7071	0.2414	0.4821	2856.0
155.0	0.02053	796.0	127.0	-45.81	-43.22	0.7229	0.2382	0.4841	2738.0
160.0	0.02088	719.0	118.0	-43.43	-40.80	0.7383	0.2355	0.4871	2624.0
165.0	0.02125	648.0	110.0	-41.03	-38.35	0.7534	0.2333	0.4911	2515.0
170.0	0.02165	583.0	102.0	-38.61	-35.88	0.7681	0.2313	0.4964	2408.0
175.0	0.02207	523.0	95.1	-36.16	-33.39	0.7826	0.2297	0.5030	2303.0
180.0	0.02253	467.0	88.3	-33.69	-30.85	0.7969	0.2284	0.5110	2200.0
185.0	0.02303	414.0	81.8	-31.17	-28.27	0.8110	0.2273	0.5207	2097.0
190.0	0.02358	365.0	75.6	-28.61	-25.64	0.8250	0.2263	0.5325	1995.0
200.0	0.02487	275.0	63.8	-23.30	-20.17	0.8531	0.2250	0.5648	1788.0
205.0	0.02563	233.0	58.2	-20.52	-17.29	0.8673	0.2246	0.5875	1681.0
210.0	0.02652	193.0	52.7	-17.62	-14.28	0.8818	0.2245	0.6177	1570.0
215.0	0.02757	155.0	47.2	-14.56	-11.09	0.8968	0.2246	0.6600	1453.0
220.0	0.02887	118.0	41.7	-11.28	-7.653	0.9127	0.2253	0.7236	1327.0
225.0	0.03059	82.9	35.8	-7.644	-3.793	0.9300	0.2267	0.8310	1186.0
230.0	0.03313	49.7	29.5	-3.341	0.8299	0.9503	0.2299	1.047	1024.0
235.0	0.03789	22.6	22.0	2.430	7.202	0.9777	0.2368	1.583	836.0
240.0	0.04851	12.6	14.7	10.59	16.70	1.018	0.2455	2.023	694.3
245.0	0.06243	15.5	10.5	17.76	25.62	1.055	0.2412	1.489	666.8
250.0	0.07412	22.2	8.36	22.48	31.81	1.080	0.2322	1.034	676.2
255.0	0.08348	29.1	7.12	25.82	36.33	1.097	0.2244	0.7983	692.5
260.0	0.09140	35.6	6.30	28.45	39.96	1.112	0.2183	0.6663	709.5
265.0	0.09833	41.5	5.69	30.68	43.07	1.123	0.2133	0.5835	725.9
270.0	0.1047	47.1	5.23	32.65	45.84	1.134	0.2093	0.5270	741.6
275.0	0.1106	52.3	4.85	34.44	48.37	1.143	0.2059	0.4861	756.5
280.0	0.1161	57.2	4.54	36.10	50.72	1.151	0.2030	0.4550	770.6
285.0	0.1213	61.8	4.28	37.65	52.93	1.159	0.2006	0.4308	784.1
290.0	0.1263	66.2	4.05	39.13	55.03	1.167	0.1985	0.4112	797.1
295.0	0.1311	70.4	3.86	40.54	57.05	1.174	0.1967	0.3952	809.5
300.0	0.1357	74.4	3.68	41.90	58.99	1.180	0.1952	0.3818	821.4
310.0	0.1446	82.1	3.39	44.49	62.69	1.192	0.1925	0.3607	844.1
320.0	0.1530	89.3	3.15	46.95	66.22	1.203	0.1905	0.3448	865.5
330.0	0.1611	96.1	2.95	49.31	69.60	1.214	0.1888	0.3325	885.7
340.0	0.1690	103.0	2.78	51.60	72.88	1.224	0.1875	0.3227	904.9
350.0	0.1766	109.0	2.63	53.82	76.06	1.233	0.1864	0.3147	923.3
360.0	0.1841	115.0	2.50	56.00	79.18	1.242	0.1855	0.3081	941.0
370.0	0.1914	121.0	2.38	58.13	82.23	1.250	0.1847	0.3026	958.0
380.0	0.1985	127.0	2.28	60.23	85.23	1.258	0.1840	0.2978	974.5
390.0	0.2055	132.0	2.19	62.31	88.19	1.266	0.1835	0.2937	990.4
400.0	0.2125	138.0	2.10	64.35	91.11	1.273	0.1830	0.2902	1006.0
410.0	0.2193	143.0	2.02	66.38	93.99	1.280	0.1826	0.2871	1021.0
420.0	0.2261	148.0	1.95	68.38	96.85	1.287	0.1822	0.2843	1036.0
430.0	0.2328	154.0	1.89	70.37	99.7	1.294	0.1819	0.2819	1050.0
440.0	0.2394	159.0	1.83	72.34	102.5	1.300	0.1816	0.2797	1064.0
450.0	0.2460	164.0	1.77	74.30	105.3	1.306	0.1813	0.2777	1078.0
460.0	0.2525	169.0	1.72	76.25	108.0	1.313	0.1811	0.2760	1091.0
470.0	0.2589	174.0	1.67	78.19	110.8	1.318	0.1809	0.2744	1104.0
480.0	0.2654	178.0	1.62	80.11	113.5	1.324	0.1807	0.2729	1117.0
490.0	0.2717	183.0	1.58	82.03	116.3	1.330	0.1806	0.2716	1130.0
500.0	0.2781	188.0	1.54	83.95	119.0	1.335	0.1804	0.2704	1142.0
510.0	0.2844	193.0	1.50	85.85	121.7	1.341	0.1803	0.2693	1154.0
520.0	0.2907	197.0	1.46	87.75	124.3	1.346	0.1802	0.2682	1166.0
530.0	0.2969	202.0	1.43	89.64	127.0	1.351	0.1801	0.2673	1178.0
540.0	0.3031	206.0	1.39	91.52	129.7	1.356	0.1800	0.2664	1190.0
550.0	0.3093	211.0	1.36	93.40	132.4	1.361	0.1799	0.2656	1202.0
560.0	0.3155	216.0	1.33	95.28	135.0	1.366	0.1798	0.2649	1213.0
570.0	0.3216	220.0	1.30	97.15	137.7	1.370	0.1798	0.2642	1224.0
580.0	0.3278	225.0	1.28	99.02	140.3	1.375	0.1797	0.2636	1235.0
590.0	0.3339	229.0	1.25	100.9	142.9	1.379	0.1797	0.2630	1246.0
600.0	0.3399	233.0	1.23	102.7	145.6	1.384	0.1796	0.2624	1257.0
700.0	0.3999	276.0	1.03	121.2	171.6	1.424	0.1798	0.2588	1358.0
800.0	0.4589	318.0	0.885	139.6	197.4	1.458	0.1806	0.2574	1449.0
900.0	0.5171	359.0	0.779	158.0	223.1	1.489	0.1822	0.2575	1533.0
1000.0	0.5749	399.0	0.696	176.5	248.9	1.516	0.1844	0.2586	1611.0
1500.0	0.8604	596.0	0.457	272.8	381.1	1.623	0.1992	0.2712	1939.0
2000.0	1.144	789.0	0.341	376.1	520.1	1.703	0.2129	0.2843	2210.0
2500.0	1.426	982.0	0.272	485.2	664.8	1.767	0.2227	0.2938	2450.0
3000.0	1.708	1170.0	0.227	598.4	813.4	1.821	0.2295	0.3005	2668.0
3500.0	1.989	1370.0	0.194	714.4	964.9	1.868	0.2342	0.3051	2871.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

680 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$(\partial H/\partial V)_P$ BTU/LB	$(\partial P/\partial V)_T$ PSIA-CU FT/BTU	$-(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.73	202.0	16.1	84300.0	0.00234	0.0928	18.4	0.00366	1.46266	3.37
125.0	53.09	193.0	14.8	81900.0	0.00247	0.0893	15.9	0.00355	1.45650	3.04
130.0	52.42	184.0	13.9	71500.0	0.00260	0.0868	14.1	0.00346	1.45009	2.79
135.0	51.72	175.0	13.1	62800.0	0.00273	0.0839	12.7	0.00338	1.44346	2.62
140.0	51.00	168.0	12.5	55400.0	0.00287	0.0809	11.7	0.00330	1.43661	2.50
145.0	50.26	160.0	12.0	49100.0	0.00303	0.0780	10.7	0.00323	1.42956	2.38
150.0	49.50	154.0	11.4	43600.0	0.00314	0.0751	9.82	0.00315	1.42231	2.27
155.0	48.71	148.0	11.0	38800.0	0.00323	0.0722	9.11	0.00306	1.41487	2.20
160.0	47.90	142.0	10.5	34400.0	0.00344	0.0694	8.45	0.00298	1.40722	2.13
165.0	47.06	136.0	10.0	30500.0	0.00361	0.0667	7.83	0.00288	1.39937	2.08
170.0	46.20	131.0	9.58	26900.0	0.00383	0.0639	7.26	0.00279	1.39128	2.03
175.0	45.31	125.0	9.14	23700.0	0.00401	0.0612	6.71	0.00269	1.38294	1.99
180.0	44.38	120.0	8.71	20700.0	0.00426	0.0586	6.20	0.00258	1.37431	1.95
185.0	43.41	115.0	8.29	18000.0	0.00455	0.0559	5.72	0.00247	1.36536	1.92
190.0	42.40	109.0	7.87	15500.0	0.00488	0.0533	5.27	0.00236	1.35603	1.89
200.0	40.21	97.7	7.06	11100.0	0.00576	0.0481	4.43	0.00212	1.33594	1.87
205.0	39.01	91.8	6.65	9090.0	0.00640	0.0456	4.03	0.00199	1.32496	1.87
210.0	37.71	85.4	6.23	7290.0	0.00723	0.0430	3.65	0.00184	1.31313	1.89
215.0	36.27	78.6	5.80	5630.0	0.00840	0.0404	3.27	0.00169	1.30016	1.92
220.0	34.64	71.1	5.34	4100.0	0.0102	0.0379	2.89	0.00151	1.28552	1.99
225.0	32.69	62.8	4.83	2710.0	0.0132	0.0356	2.51	0.00131	1.26824	2.11
230.0	30.18	53.3	4.25	1500.0	0.0197	0.0335	2.10	0.00106	1.24611	2.36
235.0	26.39	42.8	3.53	596.0	0.0370	0.0311	1.63	0.000745	1.21316	2.98
240.0	20.61	35.9	2.89	260.0	0.0563	0.0266	1.19	0.000639	1.16406	3.25
245.0	16.02	35.4	2.71	249.0	0.0421	0.0216	1.00	0.000906	1.12597	2.47
250.0	13.49	37.0	2.67	239.0	0.0279	0.0183	0.929	0.00132	1.10540	1.88
255.0	11.98	39.1	2.65	349.0	0.0204	0.0164	0.899	0.00172	1.09319	1.57
260.0	10.94	41.2	2.64	389.0	0.0162	0.0152	0.884	0.00208	1.08488	1.39
265.0	10.16	43.3	2.63	423.0	0.0135	0.0144	0.876	0.00242	1.07869	1.28
270.0	9.549	45.4	2.62	450.0	0.0116	0.0138	0.873	0.00274	1.07381	1.20
275.0	9.042	47.4	2.61	473.0	0.0103	0.0134	0.872	0.00305	1.06980	1.14
280.0	8.614	49.4	2.60	493.0	0.00922	0.0131	0.874	0.00334	1.06641	1.09
285.0	8.243	51.3	2.59	509.0	0.00840	0.0129	0.877	0.00363	1.06349	1.05
290.0	7.918	53.2	2.58	524.0	0.00773	0.0127	0.881	0.00391	1.06093	1.02
295.0	7.628	55.0	2.57	537.0	0.00718	0.0127	0.886	0.00420	1.05865	1.00
300.0	7.368	56.8	2.56	548.0	0.00672	0.0126	0.891	0.00448	1.05661	0.973
310.0	6.916	60.4	2.55	568.0	0.00597	0.0126	0.904	0.00503	1.05308	0.934
320.0	6.534	63.9	2.53	584.0	0.00540	0.0126	0.917	0.00559	1.05010	0.904
330.0	6.205	67.2	2.52	597.0	0.00495	0.0127	0.932	0.00615	1.04753	0.880
340.0	5.917	70.6	2.50	608.0	0.00457	0.0128	0.947	0.00670	1.04529	0.860
350.0	5.662	73.8	2.49	617.0	0.00426	0.0129	0.963	0.00726	1.04330	0.844
360.0	5.433	77.0	2.48	625.0	0.00400	0.0131	0.979	0.00781	1.04152	0.831
370.0	5.226	80.2	2.47	632.0	0.00377	0.0132	1.00	0.00837	1.03992	0.819
380.0	5.038	83.4	2.46	638.0	0.00357	0.0134	1.01	0.00893	1.03846	0.810
390.0	4.865	86.5	2.45	643.0	0.00340	0.0136	1.03	0.00950	1.03713	0.802
400.0	4.706	89.5	2.44	648.0	0.00324	0.0137	1.05	0.0101	1.03590	0.795
410.0	4.560	92.6	2.43	652.0	0.00310	0.0139	1.06	0.0106	1.03477	0.789
420.0	4.423	95.6	2.42	656.0	0.00298	0.0141	1.08	0.0112	1.03371	0.783
430.0	4.296	98.5	2.41	660.0	0.00286	0.0143	1.10	0.0118	1.03273	0.778
440.0	4.177	102.0	2.41	663.0	0.00276	0.0145	1.11	0.0124	1.03182	0.774
450.0	4.066	104.0	2.40	665.0	0.00266	0.0147	1.13	0.0130	1.03096	0.770
460.0	3.961	107.0	2.39	668.0	0.00257	0.0149	1.15	0.0136	1.03015	0.767
470.0	3.862	110.0	2.39	670.0	0.00249	0.0151	1.16	0.0142	1.02939	0.764
480.0	3.768	113.0	2.38	672.0	0.00241	0.0152	1.18	0.0148	1.02867	0.761
490.0	3.680	116.0	2.37	674.0	0.00234	0.0154	1.20	0.0154	1.02799	0.758
500.0	3.596	119.0	2.37	676.0	0.00227	0.0156	1.21	0.0161	1.02735	0.756
510.0	3.516	122.0	2.36	677.0	0.00221	0.0158	1.23	0.0167	1.02673	0.754
520.0	3.440	125.0	2.36	679.0	0.00215	0.0160	1.25	0.0173	1.02615	0.752
530.0	3.368	127.0	2.35	680.0	0.00210	0.0162	1.26	0.0180	1.02560	0.750
540.0	3.299	130.0	2.35	681.0	0.00205	0.0164	1.28	0.0187	1.02507	0.748
550.0	3.233	133.0	2.34	682.0	0.00200	0.0166	1.29	0.0193	1.02456	0.746
560.0	3.170	136.0	2.34	683.0	0.00195	0.0168	1.31	0.0200	1.02408	0.745
570.0	3.109	139.0	2.33	684.0	0.00191	0.0170	1.33	0.0207	1.02361	0.743
580.0	3.051	141.0	2.33	685.0	0.00186	0.0172	1.34	0.0213	1.02317	0.742
590.0	2.995	144.0	2.33	686.0	0.00182	0.0174	1.36	0.0220	1.02274	0.741
600.0	2.942	147.0	2.32	686.0	0.00179	0.0175	1.37	0.0227	1.02233	0.739
700.0	2.500	174.0	2.28	691.0	0.00148	0.0194	1.52	0.0300	1.01896	0.730
800.0	2.179	202.0	2.25	693.0	0.00126	0.0213	1.67	0.0380	1.01651	0.724
900.0	1.934	230.0	2.21	694.0	0.00112	0.0232	1.80	0.0465	1.01464	0.721
1000.0	1.739	258.0	2.17	694.0	0.00100	0.0250	1.93	0.0556	1.01316	0.718
1500.0	1.162	411.0	1.97	693.0	0.000660					
2000.0	0.8745	575.0	1.83	690.0	0.000494					
2500.0	0.7014	743.0	1.74	688.0	0.000396					
3000.0	0.5856	910.0	1.69	687.0	0.000330					
3500.0	0.5027	1080.0	1.65	686.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

700 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01861	1770.0	222.0	-62.37	-59.96	0.6001	0.2577	0.4718	3873.0
125.0	0.01883	1550.0	203.0	-60.03	-57.59	0.6194	0.2539	0.4765	3632.0
130.0	0.01907	1370.0	186.0	-57.67	-55.20	0.6382	0.2568	0.4786	3435.0
135.0	0.01933	1220.0	172.0	-55.31	-52.80	0.6562	0.2533	0.4794	3267.0
140.0	0.01960	1090.0	159.0	-52.95	-50.41	0.6737	0.2492	0.4799	3118.0
145.0	0.01989	981.0	147.0	-50.58	-48.01	0.6905	0.2453	0.4805	2984.0
150.0	0.02019	885.0	137.0	-48.22	-45.60	0.7068	0.2417	0.4817	2859.0
155.0	0.02052	800.0	127.0	-45.85	-43.19	0.7227	0.2385	0.4836	2741.0
160.0	0.02087	722.0	119.0	-43.47	-40.76	0.7381	0.2358	0.4865	2628.0
165.0	0.02123	652.0	110.0	-41.07	-38.32	0.7531	0.2335	0.4905	2519.0
170.0	0.02163	587.0	103.0	-38.66	-35.85	0.7679	0.2315	0.4956	2413.0
175.0	0.02205	527.0	95.4	-36.22	-33.36	0.7823	0.2299	0.5021	2309.0
180.0	0.02251	471.0	88.5	-33.75	-30.83	0.7965	0.2285	0.5099	2206.0
185.0	0.02301	418.0	82.1	-31.24	-28.26	0.8106	0.2274	0.5194	2104.0
190.0	0.02355	369.0	75.9	-28.69	-25.63	0.8246	0.2265	0.5309	2002.0
200.0	0.02482	279.0	64.2	-23.40	-20.18	0.8526	0.2251	0.5622	1797.0
205.0	0.02555	237.0	58.6	-20.63	-17.32	0.8667	0.2247	0.5840	1691.0
210.0	0.02643	198.0	53.1	-17.76	-14.33	0.8811	0.2245	0.6128	1582.0
215.0	0.02743	160.0	47.7	-14.73	-11.17	0.8960	0.2246	0.6525	1467.0
220.0	0.02873	123.0	42.2	-11.50	-7.731	0.9116	0.2251	0.7112	1343.0
225.0	0.03037	88.3	36.5	-7.944	-4.007	0.9286	0.2264	0.8070	1207.0
230.0	0.03272	55.5	30.4	-3.815	0.4258	0.9480	0.2290	0.9883	1053.0
235.0	0.03678	27.3	23.4	1.475	5.243	0.9730	0.2346	1.395	876.5
240.0	0.04527	14.7	16.2	8.787	14.66	1.008	0.2431	1.880	725.0
245.0	0.05774	15.3	11.6	16.02	23.50	1.045	0.2422	1.566	678.0
250.0	0.06933	20.9	9.11	21.16	30.14	1.072	0.2342	1.118	680.8
255.0	0.07883	27.6	7.67	24.79	35.01	1.091	0.2264	0.8530	693.8
260.0	0.08684	34.1	6.73	27.60	38.36	1.106	0.2200	0.7026	709.9
265.0	0.09386	40.1	6.05	29.96	42.12	1.116	0.2148	0.6092	726.0
270.0	0.1002	45.7	5.53	32.01	45.00	1.129	0.2105	0.5462	741.6
275.0	0.1061	51.0	5.12	33.87	47.62	1.139	0.2070	0.5010	756.4
280.0	0.1115	56.0	4.78	35.58	50.03	1.148	0.2040	0.4671	770.6
285.0	0.1167	60.7	4.49	37.17	52.30	1.156	0.2015	0.4407	784.1
290.0	0.1216	65.1	4.25	38.68	54.45	1.163	0.1993	0.4196	797.1
295.0	0.1264	69.4	4.04	40.12	56.50	1.170	0.1974	0.4023	809.5
300.0	0.1309	73.5	3.85	41.50	58.48	1.177	0.1958	0.3880	821.5
310.0	0.1396	81.3	3.54	44.14	62.24	1.189	0.1930	0.3655	844.4
320.0	0.1479	88.6	3.28	46.63	65.81	1.200	0.1909	0.3488	865.8
330.0	0.1559	95.5	3.07	49.02	69.23	1.211	0.1892	0.3358	886.1
340.0	0.1636	102.0	2.89	51.32	72.53	1.221	0.1878	0.3255	905.4
350.0	0.1711	108.0	2.73	53.57	75.74	1.230	0.1867	0.3171	923.9
360.0	0.1783	115.0	2.59	55.76	78.88	1.239	0.1857	0.3102	941.6
370.0	0.1855	121.0	2.47	57.91	81.95	1.247	0.1849	0.3044	958.7
380.0	0.1925	126.0	2.36	60.02	84.97	1.255	0.1842	0.2994	975.2
390.0	0.1993	132.0	2.26	62.10	87.94	1.263	0.1836	0.2952	991.2
400.0	0.2061	137.0	2.18	64.16	90.87	1.271	0.1831	0.2915	1007.0
410.0	0.2128	143.0	2.09	66.19	93.77	1.278	0.1827	0.2883	1022.0
420.0	0.2194	148.0	2.02	68.20	96.64	1.285	0.1823	0.2854	1037.0
430.0	0.2259	153.0	1.95	70.20	99.48	1.291	0.1820	0.2829	1051.0
440.0	0.2324	158.0	1.89	72.18	102.3	1.298	0.1817	0.2806	1065.0
450.0	0.2388	164.0	1.83	74.14	105.1	1.304	0.1814	0.2786	1079.0
460.0	0.2451	169.0	1.77	76.10	107.9	1.310	0.1812	0.2768	1092.0
470.0	0.2514	173.0	1.72	78.04	110.6	1.316	0.1810	0.2751	1105.0
480.0	0.2577	178.0	1.67	79.97	113.4	1.322	0.1808	0.2736	1118.0
490.0	0.2639	183.0	1.63	81.90	116.1	1.327	0.1806	0.2723	1131.0
500.0	0.2701	188.0	1.59	83.81	118.8	1.333	0.1805	0.2710	1143.0
510.0	0.2762	193.0	1.55	85.72	121.5	1.338	0.1804	0.2699	1156.0
520.0	0.2824	197.0	1.51	87.62	124.2	1.344	0.1802	0.2688	1168.0
530.0	0.2884	202.0	1.47	89.51	126.9	1.349	0.1801	0.2679	1179.0
540.0	0.2945	207.0	1.44	91.40	129.6	1.354	0.1800	0.2670	1191.0
550.0	0.3005	211.0	1.41	93.29	132.2	1.359	0.1800	0.2661	1203.0
560.0	0.3065	216.0	1.38	95.17	134.9	1.363	0.1799	0.2654	1214.0
570.0	0.3125	220.0	1.35	97.04	137.6	1.368	0.1798	0.2647	1225.0
580.0	0.3185	225.0	1.32	98.91	140.2	1.373	0.1798	0.2640	1236.0
590.0	0.3244	229.0	1.29	100.8	142.8	1.377	0.1797	0.2634	1247.0
600.0	0.3303	234.0	1.27	102.6	145.5	1.382	0.1797	0.2628	1258.0
700.0	0.3887	277.0	1.06	121.1	171.5	1.422	0.1798	0.2590	1359.0
800.0	0.4460	319.0	0.912	139.5	197.3	1.456	0.1807	0.2576	1451.0
900.0	0.5026	359.0	0.802	157.9	223.1	1.487	0.1822	0.2576	1534.0
1000.0	0.5588	400.0	0.717	176.5	248.9	1.514	0.1844	0.2587	1612.0
1500.0	0.8363	596.0	0.470	272.7	381.1	1.621	0.1992	0.2713	1940.0
2000.0	1.111	790.0	0.351	376.1	520.2	1.701	0.2129	0.2843	2211.0
2500.0	1.386	982.0	0.280	485.2	664.8	1.765	0.2227	0.2938	2451.0
3000.0	1.659	1170.0	0.233	598.4	813.5	1.819	0.2295	0.3005	2669.0
3500.0	1.933	1370.0	0.200	714.4	965.0	1.866	0.2342	0.3051	2871.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

700 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DV)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.74	202.0	16.0	95000.0	0.00233	0.0928	18.4	0.00365	1.46277	3.38
125.0	53.10	193.0	14.7	82200.0	0.00246	0.0899	15.9	0.00355	1.45662	3.04
130.0	52.43	184.0	13.8	71700.0	0.00260	0.0869	14.1	0.00346	1.45023	2.79
135.0	51.74	176.0	13.1	63000.0	0.00273	0.0839	12.8	0.00338	1.44361	2.62
140.0	51.02	168.0	12.5	55600.0	0.00286	0.0810	11.7	0.00331	1.43678	2.50
145.0	50.28	161.0	12.0	49300.0	0.00293	0.0781	10.8	0.00323	1.42975	2.38
150.0	49.52	154.0	11.4	43800.0	0.00312	0.0752	9.84	0.00315	1.42252	2.27
155.0	48.73	148.0	11.0	39000.0	0.00327	0.0723	9.13	0.00307	1.41510	2.20
160.0	47.93	142.0	10.5	34600.0	0.00342	0.0695	8.47	0.00298	1.40748	2.13
165.0	47.09	137.0	10.0	30700.0	0.00359	0.0668	7.86	0.00289	1.39966	2.08
170.0	46.23	131.0	9.58	27100.0	0.00378	0.0640	7.28	0.00279	1.39160	2.03
175.0	45.34	126.0	9.15	23900.0	0.00399	0.0613	6.74	0.00269	1.38330	1.98
180.0	44.42	120.0	8.72	20900.0	0.00424	0.0587	6.23	0.00259	1.37471	1.95
185.0	43.46	115.0	8.30	18200.0	0.00451	0.0561	5.75	0.00248	1.36580	1.92
190.0	42.46	110.0	7.89	15700.0	0.00484	0.0535	5.29	0.00237	1.35653	1.89
200.0	40.29	98.4	7.08	11200.0	0.00571	0.0483	4.45	0.00213	1.33660	1.87
205.0	39.10	92.5	6.67	9280.0	0.00631	0.0457	4.06	0.00200	1.32573	1.87
210.0	37.81	86.2	6.26	7480.0	0.00711	0.0432	3.68	0.00186	1.31406	1.88
215.0	36.40	79.6	5.84	5820.0	0.00820	0.0406	3.30	0.00171	1.30130	1.91
220.0	34.80	72.3	5.39	4290.0	0.00984	0.0382	2.93	0.00154	1.28700	1.97
225.0	32.93	64.2	4.90	2910.0	0.0126	0.0359	2.55	0.00135	1.27031	2.07
230.0	30.56	55.1	4.34	1690.0	0.0179	0.0338	2.16	0.00112	1.24944	2.27
235.0	27.19	45.1	3.68	759.0	0.0309	0.0315	1.72	0.000831	1.22003	2.74
240.0	22.09	37.5	3.02	324.0	0.0501	0.0277	1.28	0.000668	1.17647	3.13
245.0	17.32	35.9	2.76	266.0	0.0436	0.0229	1.05	0.000843	1.13666	2.58
250.0	14.42	37.0	2.70	302.0	0.0302	0.0193	0.957	0.00120	1.11295	1.99
255.0	12.68	38.9	2.67	350.0	0.0219	0.0171	0.918	0.00156	1.09888	1.64
260.0	11.52	41.0	2.66	392.0	0.0172	0.0157	0.898	0.00195	1.08948	1.44
265.0	10.65	43.0	2.64	427.0	0.0142	0.0148	0.888	0.00228	1.08259	1.32
270.0	9.98	45.1	2.63	457.0	0.0121	0.0142	0.883	0.00260	1.07723	1.23
275.0	9.429	47.1	2.62	481.0	0.0106	0.0137	0.881	0.00290	1.07286	1.16
280.0	8.967	49.1	2.61	502.0	0.00952	0.0133	0.882	0.00319	1.06920	1.11
285.0	8.570	51.0	2.60	520.0	0.00864	0.0131	0.884	0.00347	1.06606	1.07
290.0	8.222	52.9	2.59	535.0	0.00794	0.0129	0.888	0.00375	1.06333	1.04
295.0	7.914	54.7	2.58	549.0	0.00735	0.0128	0.892	0.00403	1.06090	1.01
300.0	7.638	56.5	2.58	561.0	0.00686	0.0127	0.897	0.00430	1.05873	0.983
310.0	7.161	60.1	2.56	582.0	0.00608	0.0127	0.909	0.00485	1.05499	0.942
320.0	6.759	63.6	2.54	599.0	0.00548	0.0127	0.922	0.00539	1.05185	0.910
330.0	6.414	67.0	2.53	612.0	0.00501	0.0128	0.936	0.00594	1.04916	0.885
340.0	6.113	70.3	2.52	624.0	0.00463	0.0129	0.951	0.00648	1.04681	0.865
350.0	5.846	73.6	2.50	634.0	0.00431	0.0130	0.967	0.00702	1.04473	0.848
360.0	5.607	76.8	2.49	642.0	0.00404	0.0132	0.983	0.00757	1.04288	0.834
370.0	5.392	80.0	2.48	650.0	0.00380	0.0133	1.00	0.00811	1.04121	0.822
380.0	5.196	83.2	2.47	656.0	0.00360	0.0135	1.02	0.00866	1.03969	0.812
390.0	5.017	86.3	2.46	662.0	0.00342	0.0136	1.03	0.00921	1.03830	0.804
400.0	4.852	89.3	2.45	667.0	0.00326	0.0138	1.05	0.00977	1.03702	0.797
410.0	4.699	92.4	2.44	671.0	0.00312	0.0140	1.07	0.0103	1.03585	0.790
420.0	4.558	95.4	2.43	675.0	0.00299	0.0142	1.08	0.0109	1.03475	0.785
430.0	4.426	98.4	2.42	679.0	0.00287	0.0144	1.10	0.0115	1.03374	0.780
440.0	4.303	101.0	2.41	682.0	0.00277	0.0145	1.12	0.0120	1.03279	0.775
450.0	4.188	104.0	2.41	685.0	0.00267	0.0147	1.13	0.0126	1.03190	0.771
460.0	4.079	107.0	2.40	687.0	0.00258	0.0149	1.15	0.0132	1.03106	0.768
470.0	3.977	110.0	2.39	690.0	0.00250	0.0151	1.17	0.0138	1.03028	0.765
480.0	3.880	113.0	2.39	692.0	0.00242	0.0153	1.18	0.0144	1.02953	0.762
490.0	3.789	116.0	2.38	694.0	0.00235	0.0155	1.20	0.0150	1.02883	0.759
500.0	3.702	119.0	2.37	696.0	0.00228	0.0157	1.22	0.0156	1.02816	0.757
510.0	3.620	122.0	2.37	697.0	0.00222	0.0159	1.23	0.0162	1.02753	0.754
520.0	3.542	124.0	2.36	699.0	0.00216	0.0161	1.25	0.0169	1.02693	0.752
530.0	3.467	127.0	2.36	700.0	0.00210	0.0162	1.26	0.0175	1.02636	0.750
540.0	3.396	130.0	2.35	701.0	0.00205	0.0164	1.28	0.0181	1.02581	0.748
550.0	3.328	133.0	2.35	703.0	0.00200	0.0166	1.30	0.0188	1.02529	0.747
560.0	3.262	136.0	2.34	704.0	0.00195	0.0168	1.31	0.0194	1.02479	0.745
570.0	3.200	139.0	2.34	705.0	0.00191	0.0170	1.33	0.0201	1.02431	0.744
580.0	3.140	141.0	2.33	705.0	0.00187	0.0172	1.34	0.0208	1.02385	0.742
590.0	3.083	144.0	2.33	706.0	0.00183	0.0174	1.36	0.0214	1.02341	0.741
600.0	3.027	147.0	2.33	707.0	0.00179	0.0176	1.37	0.0221	1.02299	0.740
700.0	2.573	174.0	2.29	712.0	0.00149	0.0195	1.53	0.0292	1.01951	0.730
800.0	2.242	202.0	2.25	714.0	0.00128	0.0213	1.67	0.0369	1.01699	0.725
900.0	1.989	230.0	2.21	715.0	0.00112	0.0232	1.80	0.0452	1.01506	0.721
1000.0	1.783	258.0	2.17	715.0	0.00100	0.0250	1.93	0.0541	1.01354	0.718
1500.0	1.196	411.0	1.98	713.0	0.000660					
2000.0	0.8998	575.0	1.83	711.0	0.000494					
2500.0	0.7217	743.0	1.74	709.0	0.000396					
3000.0	0.6026	911.0	1.69	708.0	0.000330					
3500.0	0.5173	1080.0	1.65	707.0	0.000283					

* TWO-PHASE BOUNDARY

750 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01360	1760.0	222.0	-62.42	-54.84	0.5987	0.2548	0.4711	3872.0
125.0	0.01382	1560.0	202.0	-60.08	-57.47	0.6190	0.2600	0.4758	3633.0
130.0	0.01305	1380.0	186.0	-57.73	-55.08	0.6377	0.2578	0.4778	3437.0
135.0	0.01931	1230.0	172.0	-55.37	-52.69	0.6557	0.2542	0.4786	3270.0
140.0	0.01958	1100.0	159.0	-53.02	-50.30	0.6732	0.2530	0.4790	3123.0
145.0	0.01987	989.0	148.0	-50.66	-47.90	0.6900	0.2460	0.4796	2989.0
150.0	0.02017	894.0	137.0	-48.30	-45.50	0.7063	0.2423	0.4806	2866.0
155.0	0.02049	808.0	128.0	-45.94	-43.09	0.7220	0.2391	0.4825	2749.0
160.0	0.02084	731.0	119.0	-43.57	-40.67	0.7374	0.2363	0.4852	2637.0
165.0	0.02120	661.0	111.0	-41.18	-38.24	0.7524	0.2340	0.4890	2530.0
170.0	0.02159	596.0	103.0	-38.78	-35.78	0.7671	0.2320	0.4938	2425.0
175.0	0.02201	536.0	96.0	-36.36	-33.30	0.7815	0.2303	0.4999	2322.0
180.0	0.02246	480.0	89.2	-33.90	-30.78	0.7956	0.2289	0.5074	2220.0
185.0	0.02295	428.0	82.7	-31.41	-28.22	0.8097	0.2278	0.5163	2120.0
190.0	0.02348	379.0	76.6	-28.88	-25.61	0.8236	0.2268	0.5271	2020.0
200.0	0.02471	289.0	65.0	-23.64	-20.21	0.8513	0.2253	0.5560	1818.0
205.0	0.02544	248.0	59.5	-20.91	-17.38	0.8653	0.2248	0.5759	1716.0
210.0	0.02628	209.0	54.1	-18.09	-14.44	0.8794	0.2245	0.6015	1610.0
215.0	0.02725	171.0	48.8	-15.14	-11.35	0.8940	0.2244	0.6358	1500.0
220.0	0.02842	135.0	43.5	-12.01	-8.068	0.9091	0.2247	0.6846	1383.0
225.0	0.02983	101.0	38.1	-8.625	-4.473	0.9252	0.2256	0.7589	1256.0
230.0	0.03188	69.3	32.4	-4.823	-0.3364	0.9432	0.2274	0.8841	1117.0
235.0	0.03491	41.3	26.3	-0.3017	4.546	0.9644	0.2310	1.118	962.7
240.0	0.04023	22.6	19.8	5.456	11.04	0.9918	0.2371	1.485	810.7
245.0	0.04897	17.5	14.5	12.05	18.85	1.024	0.2410	1.549	722.1
250.0	0.05911	19.7	11.2	17.75	25.96	1.053	0.2374	1.272	699.0
255.0	0.06547	24.8	9.22	22.06	31.57	1.075	0.2305	0.9884	702.3
260.0	0.07655	30.8	7.93	25.37	36.00	1.092	0.2239	0.7991	714.2
265.0	0.08364	36.8	7.03	28.06	39.68	1.106	0.2183	0.6783	728.4
270.0	0.08398	42.6	6.36	30.36	42.85	1.116	0.2136	0.5977	743.0
275.0	0.09578	48.0	5.83	32.39	45.63	1.128	0.2096	0.5409	757.4
280.0	0.1012	53.1	5.41	34.24	48.29	1.138	0.2063	0.4990	771.4
285.0	0.1062	58.0	5.06	35.94	50.70	1.146	0.2035	0.4669	784.8
290.0	0.1110	62.6	4.77	37.55	52.97	1.154	0.2011	0.4415	797.8
295.0	0.1156	67.0	4.51	39.06	55.12	1.162	0.1991	0.4210	810.3
300.0	0.1201	71.2	4.29	40.51	57.18	1.169	0.1973	0.4042	822.4
310.0	0.1285	79.3	3.92	43.25	61.09	1.181	0.1943	0.3781	845.4
320.0	0.1364	86.8	3.62	45.82	64.77	1.193	0.1919	0.3588	867.0
330.0	0.1440	93.9	3.38	48.27	68.28	1.204	0.1901	0.3441	887.4
340.0	0.1514	101.0	3.17	50.64	71.66	1.214	0.1886	0.3325	906.9
350.0	0.1585	107.0	2.99	52.93	74.94	1.223	0.1873	0.3232	925.5
360.0	0.1654	113.0	2.83	55.16	78.13	1.232	0.1863	0.3155	943.4
370.0	0.1722	120.0	2.70	57.34	81.25	1.241	0.1854	0.3090	960.6
380.0	0.1788	125.0	2.57	59.48	84.31	1.249	0.1847	0.3036	977.3
390.0	0.1853	131.0	2.46	61.59	87.33	1.257	0.1841	0.2989	993.4
400.0	0.1917	137.0	2.37	63.67	90.29	1.264	0.1835	0.2949	1009.0
410.0	0.1980	142.0	2.27	65.72	93.22	1.272	0.1831	0.2913	1024.0
420.0	0.2042	148.0	2.19	67.76	96.12	1.279	0.1827	0.2882	1039.0
430.0	0.2104	153.0	2.12	69.77	98.99	1.285	0.1823	0.2855	1053.0
440.0	0.2165	158.0	2.05	71.76	101.8	1.292	0.1820	0.2830	1068.0
450.0	0.2225	163.0	1.98	73.75	104.7	1.298	0.1817	0.2808	1081.0
460.0	0.2285	168.0	1.92	75.71	107.4	1.304	0.1815	0.2789	1095.0
470.0	0.2344	173.0	1.86	77.67	110.2	1.310	0.1812	0.2771	1108.0
480.0	0.2403	178.0	1.81	79.61	113.0	1.316	0.1810	0.2755	1121.0
490.0	0.2462	183.0	1.76	81.55	115.7	1.322	0.1809	0.2740	1134.0
500.0	0.2520	188.0	1.71	83.48	118.5	1.327	0.1807	0.2726	1146.0
510.0	0.2578	193.0	1.67	85.39	121.2	1.333	0.1806	0.2714	1158.0
520.0	0.2635	197.0	1.63	87.30	123.9	1.338	0.1804	0.2703	1171.0
530.0	0.2692	202.0	1.59	89.21	126.6	1.343	0.1803	0.2692	1182.0
540.0	0.2749	207.0	1.55	91.11	129.3	1.348	0.1802	0.2683	1194.0
550.0	0.2806	211.0	1.52	93.00	132.0	1.353	0.1801	0.2674	1206.0
560.0	0.2862	216.0	1.48	94.88	134.6	1.358	0.1801	0.2665	1217.0
570.0	0.2918	221.0	1.45	96.77	137.3	1.363	0.1800	0.2658	1228.0
580.0	0.2974	225.0	1.42	98.64	139.9	1.367	0.1799	0.2651	1239.0
590.0	0.3030	230.0	1.39	100.5	142.6	1.372	0.1799	0.2644	1250.0
600.0	0.3035	234.0	1.36	102.4	145.2	1.376	0.1798	0.2638	1261.0
700.0	0.3632	278.0	1.14	120.9	171.4	1.417	0.1799	0.2597	1362.0
800.0	0.4169	320.0	0.979	139.4	197.3	1.451	0.1808	0.2580	1454.0
900.0	0.4698	361.0	0.861	157.8	223.0	1.481	0.1823	0.2580	1538.0
1000.0	0.5224	401.0	0.769	176.3	248.9	1.509	0.1844	0.2590	1615.0
1500.0	0.7815	598.0	0.504	272.7	381.2	1.616	0.1932	0.2714	1943.0
2000.0	1.038	792.0	0.376	376.1	520.3	1.696	0.2129	0.2843	2213.0
2500.0	1.294	984.0	0.300	485.2	665.0	1.760	0.2227	0.2939	2453.0
3000.0	1.550	1180.0	0.250	598.4	813.7	1.815	0.2295	0.3005	2671.0
3500.0	1.805	1370.0	0.214	714.4	965.1	1.861	0.2342	0.3051	2873.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

750 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.77	203.0	15.9	95600.0	0.00232	0.0930	18.6	0.00367	1.46304	3.39
125.0	53.13	194.0	14.7	82700.0	0.00245	0.0900	16.0	0.00356	1.45693	3.05
130.0	52.47	185.0	13.8	72200.0	0.00253	0.0871	14.2	0.00347	1.45058	2.80
135.0	51.78	177.0	13.1	63500.0	0.00271	0.0841	12.8	0.00339	1.44401	2.63
140.0	51.07	169.0	12.5	56100.0	0.00284	0.0812	11.8	0.00332	1.43722	2.51
145.0	50.33	162.0	11.9	49800.0	0.00296	0.0783	10.8	0.00324	1.43023	2.39
150.0	49.58	155.0	11.4	44300.0	0.00310	0.0754	9.90	0.00316	1.42305	2.27
155.0	48.80	149.0	10.9	39400.0	0.00324	0.0726	9.19	0.00308	1.41569	2.20
160.0	47.99	143.0	10.5	35100.0	0.00339	0.0698	8.53	0.00300	1.40813	2.14
165.0	47.17	138.0	10.0	31200.0	0.00355	0.0670	7.91	0.00291	1.40037	2.08
170.0	46.32	132.0	9.60	27600.0	0.00374	0.0643	7.33	0.00281	1.39239	2.03
175.0	45.44	127.0	9.17	24400.0	0.00394	0.0616	6.79	0.00271	1.38418	1.98
180.0	44.53	122.0	8.75	21400.0	0.00417	0.0590	6.28	0.00261	1.37569	1.94
185.0	43.58	116.0	8.33	18600.0	0.00444	0.0564	5.80	0.00251	1.36690	1.91
190.0	42.59	111.0	7.93	16100.0	0.00475	0.0538	5.35	0.00240	1.35776	1.89
200.0	40.46	100.0	7.13	11700.0	0.00556	0.0487	4.52	0.00217	1.33821	1.86
205.0	39.30	94.3	6.74	9750.0	0.00611	0.0462	4.13	0.00204	1.32761	1.85
210.0	38.06	88.3	6.34	7940.0	0.00681	0.0437	3.75	0.00191	1.31629	1.86
215.0	36.70	81.9	5.93	6290.0	0.00777	0.0412	3.38	0.00177	1.30402	1.88
220.0	35.19	75.0	5.50	4770.0	0.00913	0.0388	3.02	0.00161	1.29046	1.92
225.0	33.46	67.5	5.05	3390.0	0.0112	0.0365	2.66	0.00144	1.27500	1.99
230.0	31.37	59.3	4.54	2170.0	0.0149	0.0344	2.29	0.00124	1.25652	2.11
235.0	28.65	50.3	3.97	1180.0	0.0222	0.0323	1.89	0.00101	1.23272	2.36
240.0	24.85	42.2	3.36	563.0	0.0352	0.0296	1.49	0.000801	1.19998	2.70
245.0	20.42	38.2	2.95	358.0	0.0406	0.0255	1.19	0.000806	1.16245	2.61
250.0	16.92	37.7	2.79	333.0	0.0337	0.0218	1.04	0.00101	1.13335	2.19
255.0	14.61	38.9	2.74	363.0	0.0254	0.0190	0.974	0.00132	1.11443	1.82
260.0	13.06	40.6	2.71	403.0	0.0197	0.0172	0.940	0.00165	1.10192	1.57
265.0	11.96	42.5	2.69	440.0	0.0160	0.0160	0.921	0.00197	1.09301	1.41
270.0	11.11	44.5	2.68	473.0	0.0134	0.0151	0.911	0.00227	1.08626	1.30
275.0	10.44	46.5	2.67	501.0	0.0116	0.0145	0.906	0.00256	1.08089	1.22
280.0	9.884	48.4	2.65	525.0	0.0103	0.0140	0.904	0.00284	1.07647	1.16
285.0	9.413	50.3	2.64	546.0	0.00928	0.0137	0.904	0.00311	1.07273	1.11
290.0	9.006	52.2	2.63	564.0	0.00846	0.0134	0.905	0.00338	1.06951	1.07
295.0	8.648	54.1	2.62	579.0	0.00779	0.0133	0.908	0.00365	1.06668	1.04
300.0	8.329	55.9	2.61	593.0	0.00723	0.0132	0.912	0.00391	1.06417	1.01
310.0	7.784	59.5	2.59	617.0	0.00636	0.0130	0.922	0.00443	1.05988	0.963
320.0	7.330	63.0	2.58	636.0	0.00570	0.0130	0.934	0.00495	1.05631	0.927
330.0	6.942	66.4	2.56	652.0	0.00518	0.0131	0.948	0.00547	1.05328	0.898
340.0	6.606	69.8	2.54	665.0	0.00477	0.0131	0.962	0.00599	1.05065	0.876
350.0	6.310	73.1	2.53	676.0	0.00442	0.0133	0.977	0.00650	1.04834	0.857
360.0	6.046	76.3	2.52	686.0	0.00413	0.0134	0.992	0.00702	1.04629	0.842
370.0	5.808	79.5	2.50	694.0	0.00389	0.0135	1.01	0.00753	1.04444	0.829
380.0	5.593	82.7	2.49	701.0	0.00367	0.0137	1.02	0.00805	1.04277	0.818
390.0	5.397	85.8	2.48	708.0	0.00343	0.0138	1.04	0.00857	1.04124	0.809
400.0	5.217	88.9	2.47	713.0	0.00332	0.0140	1.06	0.00910	1.03985	0.801
410.0	5.050	92.0	2.46	718.0	0.00317	0.0142	1.07	0.00963	1.03856	0.794
420.0	4.896	95.1	2.45	723.0	0.00303	0.0143	1.09	0.0102	1.03737	0.788
430.0	4.753	98.1	2.44	727.0	0.00291	0.0145	1.11	0.0107	1.03626	0.783
440.0	4.619	101.0	2.43	730.0	0.00280	0.0147	1.12	0.0112	1.03523	0.778
450.0	4.494	104.0	2.43	734.0	0.00270	0.0149	1.14	0.0118	1.03426	0.774
460.0	4.376	107.0	2.42	737.0	0.00261	0.0151	1.16	0.0123	1.03335	0.770
470.0	4.265	110.0	2.41	739.0	0.00252	0.0152	1.17	0.0129	1.03250	0.767
480.0	4.161	113.0	2.40	742.0	0.00244	0.0154	1.19	0.0135	1.03169	0.764
490.0	4.062	116.0	2.40	744.0	0.00237	0.0156	1.20	0.0140	1.03093	0.761
500.0	3.968	119.0	2.39	746.0	0.00230	0.0158	1.22	0.0146	1.03021	0.758
510.0	3.880	121.0	2.38	748.0	0.00223	0.0160	1.24	0.0152	1.02953	0.756
520.0	3.795	124.0	2.38	749.0	0.00217	0.0162	1.25	0.0158	1.02888	0.754
530.0	3.714	127.0	2.37	751.0	0.00212	0.0164	1.27	0.0164	1.02826	0.752
540.0	3.638	130.0	2.37	752.0	0.00206	0.0166	1.29	0.0170	1.02767	0.750
550.0	3.564	133.0	2.36	754.0	0.00201	0.0167	1.30	0.0176	1.02710	0.748
560.0	3.494	136.0	2.36	755.0	0.00197	0.0169	1.32	0.0182	1.02656	0.746
570.0	3.427	138.0	2.35	756.0	0.00192	0.0171	1.33	0.0188	1.02605	0.745
580.0	3.362	141.0	2.35	757.0	0.00188	0.0173	1.35	0.0194	1.02555	0.743
590.0	3.301	144.0	2.34	758.0	0.00184	0.0175	1.36	0.0200	1.02508	0.742
600.0	3.241	147.0	2.34	759.0	0.00180	0.0177	1.38	0.0207	1.02462	0.741
700.0	2.753	174.0	2.30	764.0	0.00149	0.0196	1.53	0.0273	1.02089	0.731
800.0	2.399	202.0	2.26	767.0	0.00128	0.0214	1.67	0.0346	1.01818	0.725
900.0	2.128	230.0	2.22	768.0	0.00112	0.0232	1.80	0.0423	1.01612	0.721
1000.0	1.914	258.0	2.18	768.0	0.00100	0.0251	1.93	0.0506	1.01449	0.718
1500.0	1.280	412.0	1.98	765.0	0.000659					
2000.0	0.9631	576.0	1.84	762.0	0.000434					
2500.0	0.7726	744.0	1.75	760.0	0.000335					
3000.0	0.6452	911.0	1.69	759.0	0.000330					
3500.0	0.5539	1080.0	1.65	757.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

800 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01659	1790.0	221.0	-62.46	-59.71	0.5993	0.2599	0.4705	3871.0
125.0	0.01881	1570.0	202.0	-60.13	-57.35	0.6186	0.2610	0.4751	3634.0
130.0	0.01905	1380.0	186.0	-57.79	-54.96	0.6372	0.2587	0.4771	3439.0
135.0	0.01930	1230.0	172.0	-55.44	-52.58	0.6553	0.2550	0.4778	3273.0
140.0	0.01955	1110.0	159.0	-53.09	-50.19	0.6726	0.2508	0.4781	3127.0
145.0	0.01985	1000.0	148.0	-50.74	-47.80	0.6894	0.2468	0.4786	2995.0
150.0	0.02015	902.0	138.0	-48.38	-45.40	0.7057	0.2430	0.4796	2873.0
155.0	0.02047	817.0	128.0	-46.03	-43.00	0.7214	0.2397	0.4813	2757.0
160.0	0.02081	740.0	119.0	-43.67	-40.59	0.7367	0.2369	0.4839	2647.0
165.0	0.02117	670.0	111.0	-41.29	-38.16	0.7517	0.2345	0.4875	2540.0
170.0	0.02155	605.0	104.0	-38.90	-35.71	0.7663	0.2325	0.4921	2436.0
175.0	0.02196	545.0	96.5	-36.49	-33.23	0.7807	0.2308	0.4979	2335.0
180.0	0.02241	489.0	89.8	-34.05	-30.73	0.7948	0.2293	0.5049	2235.0
185.0	0.02289	437.0	83.4	-31.57	-28.18	0.8087	0.2281	0.5134	2135.0
190.0	0.02341	388.0	77.3	-29.06	-25.59	0.8225	0.2271	0.5235	2037.0
200.0	0.02461	299.0	65.8	-23.88	-20.23	0.8500	0.2255	0.5503	1840.0
205.0	0.02532	258.0	60.4	-21.19	-17.44	0.8638	0.2249	0.5685	1739.0
210.0	0.02612	220.0	55.1	-18.41	-14.54	0.8778	0.2245	0.5914	1637.0
215.0	0.02704	183.0	49.9	-15.52	-11.51	0.8921	0.2243	0.6215	1531.0
220.0	0.02814	147.0	44.7	-12.47	-8.314	0.9068	0.2244	0.6627	1419.0
225.0	0.02948	114.0	39.5	-9.229	-4.862	0.9223	0.2250	0.7224	1301.0
230.0	0.03122	82.3	34.2	-5.661	-1.036	0.9391	0.2262	0.8152	1172.0
235.0	0.03367	54.4	28.6	-1.596	3.391	0.9582	0.2286	0.9693	1034.0
240.0	0.03748	33.1	22.7	3.256	8.809	0.9810	0.2327	1.210	892.3
245.0	0.04357	22.7	17.4	8.939	15.39	1.008	0.2372	1.385	782.8
250.0	0.05158	21.2	13.5	14.54	22.18	1.036	0.2375	1.295	732.6
255.0	0.06000	24.1	11.0	19.26	28.15	1.059	0.2330	1.085	720.2
260.0	0.06783	28.9	9.30	23.02	33.06	1.078	0.2271	0.8903	724.2
265.0	0.07483	34.4	8.13	26.06	37.14	1.094	0.2214	0.7498	734.5
270.0	0.08112	40.0	7.28	28.62	40.63	1.107	0.2164	0.6526	747.2
275.0	0.08685	45.4	6.62	30.85	43.72	1.118	0.2122	0.5837	760.5
280.0	0.09217	50.6	6.10	32.85	46.50	1.128	0.2086	0.5331	773.8
285.0	0.09714	55.5	5.68	34.68	49.07	1.137	0.2056	0.4947	787.0
290.0	0.1018	60.3	5.32	36.38	51.46	1.146	0.2030	0.4648	799.7
295.0	0.1063	64.8	5.02	37.97	53.72	1.153	0.2007	0.4408	812.1
300.0	0.1106	69.2	4.76	39.49	55.88	1.161	0.1987	0.4212	824.1
310.0	0.1187	77.4	4.33	42.34	59.93	1.174	0.1955	0.3911	847.1
320.0	0.1264	85.1	3.98	45.00	63.73	1.186	0.1930	0.3692	868.8
330.0	0.1337	92.4	3.70	47.52	67.33	1.197	0.1909	0.3527	889.3
340.0	0.1407	99.4	3.46	49.94	70.79	1.207	0.1893	0.3397	908.9
350.0	0.1475	106.0	3.26	52.28	74.13	1.217	0.1880	0.3293	927.6
360.0	0.1541	112.0	3.08	54.55	77.38	1.226	0.1869	0.3208	945.6
370.0	0.1606	119.0	2.93	56.77	80.56	1.235	0.1859	0.3137	962.9
380.0	0.1669	125.0	2.79	58.94	83.66	1.243	0.1852	0.3077	979.6
390.0	0.1730	130.0	2.67	61.08	86.71	1.251	0.1845	0.3026	996.0
400.0	0.1791	136.0	2.56	63.18	89.72	1.259	0.1839	0.2982	1011.0
410.0	0.1851	142.0	2.46	65.26	92.68	1.266	0.1834	0.2944	1027.0
420.0	0.1910	147.0	2.37	67.31	95.61	1.273	0.1830	0.2910	1042.0
430.0	0.1968	153.0	2.28	69.34	98.50	1.280	0.1826	0.2881	1056.0
440.0	0.2026	158.0	2.21	71.35	101.4	1.287	0.1823	0.2854	1070.0
450.0	0.2083	163.0	2.13	73.35	104.2	1.293	0.1820	0.2831	1084.0
460.0	0.2140	168.0	2.07	75.33	107.0	1.299	0.1817	0.2809	1098.0
470.0	0.2196	173.0	2.01	77.30	109.8	1.305	0.1815	0.2790	1111.0
480.0	0.2251	178.0	1.95	79.26	112.6	1.311	0.1813	0.2773	1124.0
490.0	0.2307	183.0	1.89	81.20	115.4	1.317	0.1811	0.2757	1137.0
500.0	0.2362	188.0	1.84	83.14	118.1	1.322	0.1809	0.2742	1149.0
510.0	0.2416	193.0	1.80	85.07	120.9	1.328	0.1808	0.2729	1162.0
520.0	0.2470	198.0	1.75	86.99	123.6	1.333	0.1806	0.2717	1174.0
530.0	0.2524	202.0	1.71	88.90	126.3	1.338	0.1805	0.2706	1186.0
540.0	0.2578	207.0	1.67	90.81	129.0	1.343	0.1804	0.2695	1197.0
550.0	0.2631	212.0	1.63	92.71	131.7	1.348	0.1803	0.2686	1209.0
560.0	0.2684	216.0	1.59	94.60	134.4	1.353	0.1802	0.2677	1220.0
570.0	0.2737	221.0	1.56	96.49	137.0	1.358	0.1801	0.2669	1232.0
580.0	0.2790	226.0	1.52	98.38	139.7	1.362	0.1801	0.2661	1243.0
590.0	0.2842	230.0	1.49	100.3	142.4	1.367	0.1800	0.2654	1254.0
600.0	0.2895	235.0	1.46	102.1	145.0	1.371	0.1800	0.2648	1264.0
700.0	0.3410	278.0	1.22	120.7	171.2	1.412	0.1800	0.2604	1366.0
800.0	0.3914	321.0	1.05	139.2	197.2	1.446	0.1809	0.2585	1457.0
900.0	0.4412	362.0	0.921	157.7	223.0	1.477	0.1824	0.2583	1541.0
1000.0	0.4905	402.0	0.822	176.2	248.9	1.504	0.1845	0.2593	1619.0
1500.0	0.7337	600.0	0.538	272.6	381.3	1.611	0.1993	0.2715	1946.0
2000.0	0.9745	793.0	0.402	376.0	520.4	1.691	0.2129	0.2844	2216.0
2500.0	1.215	986.0	0.321	485.2	665.1	1.756	0.2227	0.2939	2455.0
3000.0	1.454	1180.0	0.267	598.4	813.8	1.810	0.2295	0.3005	2673.0
3500.0	1.694	1370.0	0.229	714.4	965.3	1.857	0.2342	0.3052	2875.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

800 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DU)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.80	204.0	15.8	96100.0	0.00230	0.0931	18.7	0.00368	1.46331	3.40
125.0	53.16	195.0	14.6	83200.0	0.00243	0.0902	16.2	0.00357	1.45724	3.06
130.0	52.50	186.0	13.7	72700.0	0.00256	0.0872	14.3	0.00348	1.45093	2.81
135.0	51.82	178.0	13.0	64000.0	0.00269	0.0843	12.9	0.00340	1.44439	2.63
140.0	51.11	170.0	12.4	56600.0	0.00281	0.0814	11.9	0.00333	1.43765	2.51
145.0	50.38	163.0	11.9	50300.0	0.00294	0.0785	10.9	0.00325	1.43071	2.39
150.0	49.63	156.0	11.4	44800.0	0.00307	0.0756	9.95	0.00318	1.42358	2.27
155.0	48.86	150.0	10.9	39900.0	0.00321	0.0728	9.24	0.00310	1.41627	2.20
160.0	48.06	144.0	10.5	35600.0	0.00336	0.0700	8.58	0.00301	1.40877	2.14
165.0	47.24	139.0	10.0	31600.0	0.00352	0.0673	7.97	0.00292	1.40108	2.08
170.0	46.40	133.0	9.61	28100.0	0.00369	0.0646	7.39	0.00283	1.39317	2.03
175.0	45.53	128.0	9.19	24800.0	0.00389	0.0619	6.85	0.00273	1.38504	1.98
180.0	44.63	123.0	8.77	21800.0	0.00411	0.0593	6.34	0.00263	1.37665	1.94
185.0	43.69	118.0	8.37	19100.0	0.00436	0.0567	5.86	0.00253	1.36797	1.91
190.0	42.72	112.0	7.97	16600.0	0.00466	0.0542	5.41	0.00242	1.35897	1.88
200.0	40.63	102.0	7.19	12200.0	0.00541	0.0491	4.58	0.00220	1.33976	1.85
205.0	39.50	96.0	6.80	10200.0	0.00592	0.0466	4.19	0.00208	1.32941	1.84
210.0	38.29	90.2	6.41	8410.0	0.00656	0.0442	3.82	0.00195	1.31840	1.84
215.0	36.98	84.1	6.02	6750.0	0.00739	0.0417	3.46	0.00181	1.30657	1.85
220.0	35.54	77.5	5.61	5230.0	0.00855	0.0393	3.10	0.00167	1.29363	1.88
225.0	33.92	70.5	5.18	3860.0	0.0102	0.0371	2.75	0.00151	1.27914	1.93
230.0	32.03	62.9	4.72	2640.0	0.0130	0.0350	2.40	0.00134	1.26234	2.01
235.0	29.70	54.8	4.21	1620.0	0.0177	0.0330	2.04	0.00115	1.24188	2.15
240.0	26.68	46.9	3.66	882.0	0.0258	0.0307	1.67	0.000952	1.21565	2.37
245.0	22.95	41.4	3.19	520.0	0.0334	0.0275	1.35	0.000865	1.18378	2.45
250.0	19.39	39.5	2.93	412.0	0.0328	0.0239	1.15	0.000952	1.15381	2.24
255.0	16.67	39.6	2.83	401.0	0.0274	0.0210	1.04	0.00116	1.13129	1.95
260.0	14.74	40.8	2.78	426.0	0.0218	0.0188	0.990	0.00143	1.11556	1.69
265.0	13.36	42.4	2.75	459.0	0.0177	0.0172	0.960	0.00172	1.10436	1.50
270.0	12.33	44.2	2.73	493.0	0.0148	0.0161	0.942	0.00200	1.09600	1.37
275.0	11.51	46.0	2.71	523.0	0.0127	0.0153	0.932	0.00228	1.08946	1.28
280.0	10.85	47.9	2.70	549.0	0.0111	0.0147	0.927	0.00255	1.08416	1.21
285.0	10.29	49.8	2.68	572.0	0.00993	0.0143	0.925	0.00281	1.07973	1.15
290.0	9.820	51.7	2.67	592.0	0.00893	0.0140	0.925	0.00306	1.07596	1.11
295.0	9.406	53.5	2.66	610.0	0.00823	0.0138	0.926	0.00332	1.07268	1.07
300.0	9.042	55.4	2.65	625.0	0.00761	0.0136	0.929	0.00357	1.06979	1.04
310.0	8.422	59.0	2.63	652.0	0.00663	0.0134	0.937	0.00407	1.06490	0.984
320.0	7.912	62.5	2.61	674.0	0.00591	0.0133	0.947	0.00457	1.06088	0.944
330.0	7.479	65.9	2.59	691.0	0.00535	0.0134	0.959	0.00506	1.05749	0.912
340.0	7.106	69.3	2.57	706.0	0.00490	0.0134	0.972	0.00556	1.05456	0.887
350.0	6.779	72.6	2.56	719.0	0.00454	0.0135	0.986	0.00605	1.05200	0.866
360.0	6.489	75.9	2.54	729.0	0.00423	0.0136	1.00	0.00654	1.04974	0.850
370.0	6.228	79.1	2.53	739.0	0.00397	0.0137	1.02	0.00703	1.04771	0.836
380.0	5.993	82.3	2.52	747.0	0.00374	0.0139	1.03	0.00752	1.04588	0.824
390.0	5.779	85.5	2.50	754.0	0.00354	0.0140	1.05	0.00802	1.04421	0.814
400.0	5.583	88.6	2.49	760.0	0.00337	0.0142	1.06	0.00851	1.04269	0.806
410.0	5.402	91.7	2.48	766.0	0.00321	0.0143	1.08	0.00901	1.04129	0.798
420.0	5.235	94.7	2.47	771.0	0.00307	0.0145	1.10	0.00952	1.03999	0.792
430.0	5.080	97.8	2.46	775.0	0.00295	0.0147	1.11	0.0100	1.03879	0.786
440.0	4.936	101.0	2.45	779.0	0.00283	0.0148	1.13	0.0105	1.03767	0.781
450.0	4.800	104.0	2.44	783.0	0.00273	0.0150	1.14	0.0111	1.03663	0.777
460.0	4.673	107.0	2.44	786.0	0.00263	0.0152	1.16	0.0116	1.03565	0.773
470.0	4.554	110.0	2.43	789.0	0.00254	0.0154	1.18	0.0121	1.03472	0.769
480.0	4.442	113.0	2.42	792.0	0.00246	0.0156	1.19	0.0126	1.03386	0.766
490.0	4.335	116.0	2.41	794.0	0.00239	0.0157	1.21	0.0132	1.03303	0.763
500.0	4.234	118.0	2.41	796.0	0.00232	0.0159	1.23	0.0137	1.03226	0.760
510.0	4.139	121.0	2.40	798.0	0.00225	0.0161	1.24	0.0143	1.03152	0.758
520.0	4.048	124.0	2.39	800.0	0.00219	0.0163	1.26	0.0148	1.03082	0.755
530.0	3.962	127.0	2.39	802.0	0.00213	0.0165	1.27	0.0154	1.03016	0.753
540.0	3.879	130.0	2.38	803.0	0.00207	0.0167	1.29	0.0159	1.02952	0.751
550.0	3.801	133.0	2.38	805.0	0.00202	0.0169	1.31	0.0165	1.02892	0.749
560.0	3.725	136.0	2.37	806.0	0.00197	0.0170	1.32	0.0171	1.02834	0.748
570.0	3.653	138.0	2.37	807.0	0.00193	0.0172	1.34	0.0177	1.02779	0.746
580.0	3.584	141.0	2.36	808.0	0.00188	0.0174	1.35	0.0183	1.02726	0.744
590.0	3.518	144.0	2.36	809.0	0.00184	0.0176	1.37	0.0188	1.02675	0.743
600.0	3.455	147.0	2.35	810.0	0.00180	0.0178	1.38	0.0194	1.02626	0.742
700.0	2.933	174.0	2.31	816.0	0.00143	0.0196	1.53	0.0257	1.02226	0.732
800.0	2.555	202.0	2.27	819.0	0.00128	0.0215	1.67	0.0325	1.01937	0.725
900.0	2.267	230.0	2.23	820.0	0.00112	0.0233	1.81	0.0338	1.01717	0.721
1000.0	2.039	259.0	2.18	820.0	0.00100	0.0251	1.93	0.0475	1.01544	0.719
1500.0	1.363	412.0	1.98	817.0	0.000659					
2000.0	1.026	577.0	1.84	814.0	0.000493					
2500.0	0.8234	744.0	1.75	812.0	0.000395					
3000.0	0.6877	912.0	1.69	810.0	0.000329					
3500.0	0.5904	1080.0	1.65	809.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

850 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01858	1800.0	221.0	-62.51	-59.59	0.5989	0.2610	0.4699	3871.0
125.0	0.01880	1570.0	202.0	-60.18	-57.22	0.6161	0.2620	0.4744	3634.0
130.0	0.01903	1390.0	186.0	-57.84	-54.85	0.6363	0.2597	0.4763	3441.0
135.0	0.01928	1240.0	172.0	-55.50	-52.46	0.6548	0.2559	0.4770	3277.0
140.0	0.01955	1120.0	159.0	-53.15	-50.08	0.6721	0.2516	0.4773	3132.0
145.0	0.01983	1010.0	148.0	-50.81	-47.69	0.6889	0.2475	0.4777	3001.0
150.0	0.02013	911.0	138.0	-48.47	-45.30	0.7051	0.2437	0.4786	2879.0
155.0	0.02044	826.0	129.0	-46.12	-42.90	0.7208	0.2403	0.4802	2765.0
160.0	0.02078	749.0	120.0	-43.77	-40.50	0.7361	0.2374	0.4826	2656.0
165.0	0.02113	679.0	112.0	-41.40	-38.07	0.7510	0.2350	0.4860	2550.0
170.0	0.02151	614.0	104.0	-39.02	-35.63	0.7656	0.2329	0.4904	2448.0
175.0	0.02192	554.0	97.1	-36.62	-33.17	0.7799	0.2312	0.4959	2347.0
180.0	0.02236	498.0	90.4	-34.19	-30.67	0.7939	0.2297	0.5026	2249.0
185.0	0.02283	447.0	84.0	-31.73	-28.14	0.8078	0.2284	0.5106	2151.0
190.0	0.02334	398.0	78.0	-29.24	-25.56	0.8215	0.2273	0.5201	2054.0
200.0	0.02451	309.0	66.6	-24.10	-20.25	0.8488	0.2256	0.5451	1860.0
205.0	0.02520	269.0	61.3	-21.45	-17.48	0.8625	0.2250	0.5617	1762.0
210.0	0.02597	230.0	56.0	-18.71	-14.62	0.8762	0.2245	0.5824	1663.0
215.0	0.02685	193.0	50.9	-15.87	-11.65	0.8902	0.2243	0.6089	1560.0
220.0	0.02788	159.0	45.9	-12.91	-8.528	0.9046	0.2242	0.6443	1453.0
225.0	0.02912	126.0	40.8	-9.775	-5.191	0.9196	0.2245	0.6935	1341.0
230.0	0.03068	94.8	35.7	-6.385	-1.555	0.9356	0.2254	0.7656	1222.0
235.0	0.03275	67.0	30.5	-2.628	2.527	0.9532	0.2270	0.8758	1095.0
240.0	0.03574	44.4	25.2	1.669	7.234	0.9732	0.2298	1.040	964.2
245.0	0.04021	30.1	20.0	6.612	12.94	0.997	0.2335	1.207	849.4
250.0	0.04635	25.0	15.8	11.81	19.11	1.021	0.2355	1.230	778.0
255.0	0.05345	25.3	12.9	16.59	25.01	1.045	0.2336	1.114	748.1
260.0	0.06062	28.5	10.8	20.64	30.18	1.065	0.2291	0.9552	741.3
265.0	0.06733	33.0	9.36	23.99	34.59	1.082	0.2239	0.8140	745.5
270.0	0.07347	38.1	8.30	26.81	38.38	1.096	0.2190	0.7063	754.8
275.0	0.07911	43.3	7.49	29.25	41.70	1.108	0.2146	0.6272	766.1
280.0	0.08432	48.5	6.86	31.41	44.68	1.119	0.2108	0.5684	778.3
285.0	0.08919	53.5	6.35	33.37	47.41	1.128	0.2076	0.5237	790.7
290.0	0.09378	58.3	5.92	35.18	49.94	1.137	0.2048	0.4889	803.0
295.0	0.09814	62.9	5.56	36.86	52.31	1.145	0.2023	0.4613	815.0
300.0	0.1023	67.3	5.26	38.46	54.56	1.153	0.2002	0.4388	826.9
310.0	0.1102	75.7	4.75	41.42	58.77	1.167	0.1967	0.4046	849.6
320.0	0.1176	83.6	4.36	44.17	62.68	1.179	0.1940	0.3799	871.2
330.0	0.1246	91.1	4.03	46.77	66.38	1.191	0.1918	0.3614	891.7
340.0	0.1314	98.2	3.77	49.25	69.92	1.201	0.1901	0.3470	911.3
350.0	0.1379	105.0	3.54	51.63	73.33	1.211	0.1886	0.3355	930.1
360.0	0.1442	111.0	3.34	53.94	76.64	1.220	0.1874	0.3262	948.1
370.0	0.1503	118.0	3.17	56.20	79.86	1.229	0.1865	0.3184	965.5
380.0	0.1564	124.0	3.02	58.40	83.01	1.238	0.1856	0.3119	982.2
390.0	0.1623	130.0	2.88	60.57	86.10	1.246	0.1849	0.3064	998.0
400.0	0.1680	136.0	2.76	62.69	89.14	1.253	0.1843	0.3016	1014.0
410.0	0.1737	141.0	2.65	64.79	92.14	1.261	0.1838	0.2975	1030.0
420.0	0.1794	147.0	2.55	66.86	95.09	1.268	0.1833	0.2939	1044.0
430.0	0.1849	152.0	2.46	68.91	98.02	1.275	0.1829	0.2906	1059.0
440.0	0.1904	158.0	2.37	70.94	100.9	1.281	0.1825	0.2878	1073.0
450.0	0.1958	163.0	2.29	72.95	103.8	1.288	0.1822	0.2853	1087.0
460.0	0.2012	168.0	2.22	74.95	106.6	1.294	0.1820	0.2830	1101.0
470.0	0.2065	173.0	2.15	76.93	109.4	1.300	0.1817	0.2809	1114.0
480.0	0.2118	178.0	2.09	78.90	112.2	1.306	0.1815	0.2791	1127.0
490.0	0.2170	183.0	2.03	80.86	115.0	1.312	0.1813	0.2774	1140.0
500.0	0.2222	188.0	1.97	82.81	117.8	1.317	0.1811	0.2758	1152.0
510.0	0.2274	193.0	1.92	84.74	120.5	1.323	0.1809	0.2744	1165.0
520.0	0.2325	198.0	1.87	86.67	123.3	1.328	0.1808	0.2731	1177.0
530.0	0.2376	203.0	1.83	88.60	126.0	1.333	0.1807	0.2719	1189.0
540.0	0.2427	207.0	1.78	90.51	128.7	1.338	0.1806	0.2708	1200.0
550.0	0.2477	212.0	1.74	92.42	131.4	1.343	0.1805	0.2698	1212.0
560.0	0.2528	217.0	1.70	94.32	134.1	1.348	0.1804	0.2689	1223.0
570.0	0.2578	221.0	1.66	96.22	136.8	1.353	0.1803	0.2680	1235.0
580.0	0.2627	226.0	1.63	98.11	133.5	1.358	0.1802	0.2672	1246.0
590.0	0.2677	231.0	1.59	100.0	142.1	1.362	0.1802	0.2664	1257.0
600.0	0.2727	235.0	1.56	101.9	144.8	1.367	0.1801	0.2657	1268.0
700.0	0.3213	279.0	1.30	120.5	171.1	1.407	0.1801	0.2610	1369.0
800.0	0.3689	322.0	1.12	139.0	197.1	1.442	0.1809	0.2590	1460.0
900.0	0.4158	363.0	0.980	157.5	223.0	1.472	0.1825	0.2587	1544.0
1000.0	0.4623	404.0	0.875	176.1	248.9	1.500	0.1846	0.2596	1622.0
1500.0	0.6914	601.0	0.572	272.6	381.4	1.607	0.1993	0.2716	1949.0
2000.0	0.9182	795.0	0.427	376.0	520.5	1.687	0.2129	0.2844	2218.0
2500.0	1.144	988.0	0.341	485.2	665.3	1.751	0.2227	0.2939	2457.0
3000.0	1.370	1180.0	0.284	598.4	814.0	1.806	0.2295	0.3005	2675.0
3500.0	1.595	1370.0	0.243	714.4	965.5	1.852	0.2342	0.3052	2877.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

850 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.82	205.0	15.7	96700.0	0.00229	0.0932	18.8	0.00369	1.46358	3.42
125.0	53.20	197.0	14.5	83800.0	0.00241	0.0903	16.3	0.00358	1.45754	3.07
130.0	52.54	187.0	13.6	73200.0	0.00254	0.0874	14.3	0.00349	1.45127	2.82
135.0	51.86	179.0	13.0	64500.0	0.00267	0.0845	13.0	0.00342	1.44478	2.64
140.0	51.16	171.0	12.4	57100.0	0.00279	0.0816	11.9	0.00334	1.43808	2.51
145.0	50.43	164.0	11.9	50800.0	0.00292	0.0787	11.0	0.00327	1.43118	2.40
150.0	49.69	157.0	11.4	45300.0	0.00305	0.0758	10.0	0.00319	1.42410	2.27
155.0	48.92	151.0	10.9	40400.0	0.00318	0.0730	9.30	0.00311	1.41685	2.20
160.0	48.13	145.0	10.5	36000.0	0.00332	0.0703	8.64	0.00302	1.40940	2.14
165.0	47.32	140.0	10.0	32100.0	0.00348	0.0675	8.02	0.00294	1.40177	2.08
170.0	46.48	134.0	9.62	28600.0	0.00365	0.0649	7.44	0.00285	1.39394	2.03
175.0	45.62	129.0	9.21	25300.0	0.00384	0.0622	6.90	0.00275	1.38589	1.98
180.0	44.73	124.0	8.80	22300.0	0.00405	0.0596	6.40	0.00265	1.37759	1.94
185.0	43.81	119.0	8.40	19600.0	0.00429	0.0571	5.92	0.00255	1.36902	1.91
190.0	42.85	114.0	8.00	17100.0	0.00457	0.0545	5.47	0.00245	1.36014	1.88
200.0	40.80	103.0	7.24	12600.0	0.00528	0.0495	4.64	0.00223	1.34127	1.84
205.0	39.69	97.7	6.86	10700.0	0.00575	0.0471	4.26	0.00211	1.33114	1.83
210.0	38.51	92.1	6.48	8860.0	0.00632	0.0446	3.89	0.00199	1.32042	1.83
215.0	37.25	86.2	6.10	7210.0	0.00707	0.0422	3.53	0.00186	1.30897	1.83
220.0	35.87	79.9	5.70	5690.0	0.00806	0.0399	3.18	0.00173	1.29656	1.85
225.0	34.34	73.3	5.30	4320.0	0.00946	0.0377	2.84	0.00158	1.28287	1.88
230.0	32.59	66.2	4.87	3090.0	0.0116	0.0356	2.50	0.00143	1.26734	1.94
235.0	30.53	58.7	4.40	2050.0	0.0149	0.0337	2.16	0.00126	1.24912	2.02
240.0	27.98	51.3	3.91	1240.0	0.0203	0.0316	1.82	0.00109	1.22692	2.16
245.0	24.87	45.2	3.44	749.0	0.0267	0.0290	1.51	0.000965	1.20012	2.26
250.0	21.57	42.0	3.11	539.0	0.0293	0.0257	1.27	0.000970	1.17210	2.19
255.0	18.70	41.1	2.94	474.0	0.0271	0.0227	1.13	0.00109	1.14813	1.99
260.0	16.50	41.5	2.86	469.0	0.0230	0.0203	1.05	0.00129	1.12989	1.77
265.0	14.85	42.6	2.81	490.0	0.0191	0.0185	1.00	0.00153	1.11644	1.59
270.0	13.61	44.2	2.78	519.0	0.0160	0.0172	0.978	0.00179	1.10635	1.45
275.0	12.64	45.9	2.76	548.0	0.0137	0.0162	0.962	0.00205	1.09852	1.34
280.0	11.86	47.7	2.74	575.0	0.0119	0.0155	0.953	0.00230	1.09224	1.26
285.0	11.21	49.5	2.73	600.0	0.0106	0.0150	0.947	0.00255	1.08706	1.19
290.0	10.66	51.3	2.71	621.0	0.00953	0.0146	0.945	0.00279	1.08267	1.14
295.0	10.19	53.1	2.70	641.0	0.00868	0.0143	0.945	0.00304	1.07890	1.10
300.0	9.774	54.9	2.69	658.0	0.00799	0.0141	0.946	0.00328	1.07560	1.06
310.0	9.075	58.5	2.66	687.0	0.00691	0.0138	0.951	0.00376	1.07006	1.00
320.0	8.504	62.0	2.64	711.0	0.00613	0.0137	0.960	0.00423	1.06555	0.960
330.0	8.024	65.5	2.62	731.0	0.00552	0.0136	0.971	0.00471	1.06177	0.926
340.0	7.612	68.9	2.60	747.0	0.00504	0.0137	0.983	0.00518	1.05853	0.898
350.0	7.253	72.2	2.59	761.0	0.00465	0.0137	1.00	0.00565	1.05571	0.876
360.0	6.935	75.5	2.57	773.0	0.00432	0.0138	1.01	0.00612	1.05323	0.857
370.0	6.651	78.7	2.55	783.0	0.00404	0.0140	1.03	0.00659	1.05101	0.842
380.0	6.396	82.0	2.54	792.0	0.00381	0.0141	1.04	0.00706	1.04901	0.830
390.0	6.163	85.1	2.53	800.0	0.00360	0.0142	1.06	0.00753	1.04720	0.819
400.0	5.951	88.3	2.52	807.0	0.00342	0.0144	1.07	0.00800	1.04555	0.810
410.0	5.756	91.4	2.50	813.0	0.00326	0.0145	1.09	0.00848	1.04403	0.802
420.0	5.575	94.5	2.49	819.0	0.00311	0.0147	1.10	0.00896	1.04263	0.795
430.0	5.408	97.5	2.48	824.0	0.00298	0.0148	1.12	0.00944	1.04133	0.789
440.0	5.252	101.0	2.47	828.0	0.00286	0.0150	1.14	0.00992	1.04013	0.784
450.0	5.107	104.0	2.46	832.0	0.00275	0.0152	1.15	0.0104	1.03900	0.779
460.0	4.971	107.0	2.45	836.0	0.00266	0.0153	1.17	0.0109	1.03794	0.775
470.0	4.843	109.0	2.45	839.0	0.00257	0.0155	1.18	0.0114	1.03695	0.771
480.0	4.722	112.0	2.44	842.0	0.00248	0.0157	1.20	0.0119	1.03602	0.768
490.0	4.608	115.0	2.43	844.0	0.00240	0.0159	1.22	0.0124	1.03514	0.765
500.0	4.500	118.0	2.42	847.0	0.00233	0.0161	1.23	0.0129	1.03431	0.762
510.0	4.398	121.0	2.42	849.0	0.00226	0.0162	1.25	0.0135	1.03352	0.759
520.0	4.301	124.0	2.41	851.0	0.00220	0.0164	1.26	0.0140	1.03277	0.757
530.0	4.209	127.0	2.40	853.0	0.00214	0.0166	1.28	0.0145	1.03206	0.754
540.0	4.121	130.0	2.40	855.0	0.00209	0.0168	1.29	0.0150	1.03138	0.752
550.0	4.037	133.0	2.39	856.0	0.00203	0.0170	1.31	0.0156	1.03073	0.750
560.0	3.956	136.0	2.38	858.0	0.00198	0.0171	1.33	0.0161	1.03012	0.749
570.0	3.879	138.0	2.38	859.0	0.00194	0.0173	1.34	0.0167	1.02953	0.747
580.0	3.806	141.0	2.37	860.0	0.00189	0.0175	1.36	0.0172	1.02896	0.745
590.0	3.735	144.0	2.37	861.0	0.00185	0.0177	1.37	0.0178	1.02842	0.744
600.0	3.668	147.0	2.36	862.0	0.00181	0.0179	1.39	0.0183	1.02790	0.743
700.0	3.112	175.0	2.32	869.0	0.00150	0.0197	1.54	0.0243	1.02364	0.732
800.0	2.711	202.0	2.28	872.0	0.00128	0.0215	1.68	0.0307	1.02056	0.726
900.0	2.405	230.0	2.23	873.0	0.00112	0.0234	1.81	0.0376	1.01823	0.722
1000.0	2.163	259.0	2.19	873.0	0.00100	0.0252	1.94	0.0449	1.01638	0.719
1500.0	1.446	413.0	1.99	870.0	0.000658					
2000.0	1.089	577.0	1.84	866.0	0.000493					
2500.0	0.8740	745.0	1.75	863.0	0.000395					
3000.0	0.7301	913.0	1.69	861.0	0.000329					
3500.0	0.6269	1080.0	1.65	860.0	0.000283					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

900 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
120.0	0.01857	1810.0	221.0	-62.56	-59.46	0.5985	0.2621	0.4632	3870.0
125.0	0.01879	1580.0	202.0	-60.23	-57.10	0.6177	0.2630	0.4737	3635.0
130.0	0.01902	1400.0	186.0	-57.90	-54.73	0.6364	0.2606	0.4756	3443.0
135.0	0.01927	1250.0	172.0	-55.56	-52.35	0.6543	0.2567	0.4762	3280.0
140.0	0.01953	1120.0	160.0	-53.22	-49.97	0.6716	0.2524	0.4765	3136.0
145.0	0.01981	1020.0	148.0	-50.89	-47.58	0.6884	0.2482	0.4768	3007.0
150.0	0.02010	920.0	138.0	-48.55	-45.20	0.7045	0.2443	0.4776	2886.0
155.0	0.02042	835.0	129.0	-46.21	-42.81	0.7202	0.2409	0.4791	2773.0
160.0	0.02075	758.0	120.0	-43.86	-40.41	0.7355	0.2380	0.4814	2665.0
165.0	0.02110	688.0	112.0	-41.51	-37.99	0.7503	0.2355	0.4846	2561.0
170.0	0.02148	623.0	105.0	-39.14	-35.56	0.7649	0.2334	0.4888	2459.0
175.0	0.02188	564.0	97.6	-36.75	-33.10	0.7791	0.2316	0.4940	2360.0
180.0	0.02231	508.0	91.0	-34.33	-30.62	0.7931	0.2301	0.5003	2262.0
185.0	0.02277	456.0	84.7	-31.89	-28.10	0.8069	0.2287	0.5079	2166.0
190.0	0.02327	407.0	78.7	-29.41	-25.53	0.8206	0.2276	0.5169	2071.0
200.0	0.02442	319.0	67.4	-24.33	-20.26	0.8476	0.2258	0.5402	1880.0
205.0	0.02508	279.0	62.1	-21.70	-17.52	0.8612	0.2252	0.5554	1785.0
210.0	0.02582	240.0	56.9	-19.00	-14.70	0.8748	0.2246	0.5742	1687.0
215.0	0.02667	204.0	51.9	-16.21	-11.77	0.8885	0.2242	0.5979	1588.0
220.0	0.02764	170.0	47.0	-13.31	-8.715	0.9026	0.2241	0.6286	1486.0
225.0	0.02880	137.0	42.1	-10.27	-5.474	0.9172	0.2242	0.6700	1379.0
230.0	0.03022	107.0	37.2	-7.025	-1.988	0.9325	0.2247	0.7279	1266.0
235.0	0.03204	79.2	32.2	-3.493	1.846	0.9490	0.2258	0.8112	1148.0
240.0	0.03450	55.8	27.2	0.4319	6.182	0.9672	0.2277	0.9290	1027.0
245.0	0.03798	39.1	22.3	4.840	11.17	0.9878	0.2305	1.064	914.4
250.0	0.04275	30.6	18.0	9.586	16.71	1.010	0.2328	1.134	830.4
255.0	0.04853	28.3	14.8	14.22	22.31	1.032	0.2327	1.091	784.3
260.0	0.05485	29.6	12.4	18.37	27.51	1.053	0.2299	0.9822	765.4
265.0	0.06107	32.9	10.7	21.94	32.12	1.070	0.2256	0.8602	761.9
270.0	0.06693	37.2	9.40	24.99	36.14	1.085	0.2210	0.7532	766.3
275.0	0.07239	42.0	8.43	27.62	39.68	1.098	0.2167	0.6684	774.7
280.0	0.07747	46.9	7.67	29.95	42.86	1.110	0.2128	0.6032	785.0
285.0	0.08222	51.8	7.06	32.04	45.74	1.120	0.2094	0.5529	796.2
290.0	0.08670	56.6	6.56	33.95	48.40	1.129	0.2064	0.5135	807.7
295.0	0.09094	61.2	6.14	35.73	50.89	1.138	0.2039	0.4822	819.2
300.0	0.09500	65.7	5.78	37.40	53.23	1.145	0.2016	0.4567	830.7
310.0	0.1026	74.3	5.20	40.49	57.60	1.160	0.1979	0.4183	852.9
320.0	0.1098	82.3	4.75	43.34	61.64	1.173	0.1950	0.3908	874.3
330.0	0.1166	89.9	4.38	46.01	65.44	1.184	0.1927	0.3702	894.7
340.0	0.1231	97.1	4.08	48.54	69.06	1.195	0.1908	0.3544	914.2
350.0	0.1293	104.0	3.83	50.98	72.54	1.205	0.1893	0.3418	933.0
360.0	0.1354	111.0	3.61	53.33	75.90	1.215	0.1880	0.3316	951.0
370.0	0.1413	117.0	3.41	55.62	79.17	1.224	0.1870	0.3232	968.3
380.0	0.1471	123.0	3.25	57.86	82.37	1.232	0.1861	0.3161	985.1
390.0	0.1527	129.0	3.10	60.05	85.50	1.240	0.1853	0.3101	1001.0
400.0	0.1582	135.0	2.96	62.20	88.58	1.248	0.1847	0.3050	1017.0
410.0	0.1637	141.0	2.84	64.33	91.60	1.256	0.1841	0.3006	1033.0
420.0	0.1690	147.0	2.73	66.42	94.59	1.263	0.1836	0.2967	1047.0
430.0	0.1743	152.0	2.63	68.49	97.54	1.270	0.1832	0.2932	1062.0
440.0	0.1795	157.0	2.54	70.53	100.5	1.276	0.1828	0.2902	1076.0
450.0	0.1847	163.0	2.45	72.56	103.3	1.283	0.1825	0.2875	1090.0
460.0	0.1898	168.0	2.37	74.57	106.2	1.289	0.1822	0.2850	1104.0
470.0	0.1949	173.0	2.30	76.56	109.0	1.295	0.1819	0.2828	1117.0
480.0	0.1999	178.0	2.23	78.55	111.9	1.301	0.1817	0.2809	1130.0
490.0	0.2049	183.0	2.17	80.52	114.7	1.307	0.1815	0.2791	1143.0
500.0	0.2098	188.0	2.11	82.47	117.4	1.313	0.1813	0.2774	1156.0
510.0	0.2147	193.0	2.05	84.42	120.2	1.318	0.1811	0.2759	1168.0
520.0	0.2196	198.0	2.00	86.36	123.0	1.323	0.1810	0.2745	1180.0
530.0	0.2245	203.0	1.95	88.29	125.7	1.329	0.1808	0.2733	1192.0
540.0	0.2293	208.0	1.90	90.21	128.4	1.334	0.1807	0.2721	1204.0
550.0	0.2341	212.0	1.86	92.13	131.1	1.339	0.1806	0.2710	1215.0
560.0	0.2388	217.0	1.81	94.04	133.8	1.344	0.1805	0.2700	1227.0
570.0	0.2436	222.0	1.77	95.94	136.5	1.348	0.1804	0.2691	1238.0
580.0	0.2483	226.0	1.73	97.84	139.2	1.353	0.1804	0.2682	1249.0
590.0	0.2530	231.0	1.70	99.7	141.9	1.358	0.1803	0.2674	1260.0
600.0	0.2577	236.0	1.66	101.6	144.6	1.362	0.1803	0.2667	1271.0
700.0	0.3038	280.0	1.38	120.3	171.0	1.403	0.1802	0.2617	1372.0
800.0	0.3499	323.0	1.18	138.9	197.0	1.438	0.1810	0.2595	1464.0
900.0	0.3333	364.0	1.04	157.4	222.9	1.468	0.1825	0.2591	1548.0
1000.0	0.4373	405.0	0.927	176.0	248.9	1.495	0.1846	0.2599	1625.0
1500.0	0.6539	603.0	0.606	272.5	381.5	1.603	0.1993	0.2717	1951.0
2000.0	0.8681	797.0	0.452	376.0	520.7	1.683	0.2130	0.2845	2221.0
2500.0	1.082	989.0	0.361	485.2	665.4	1.747	0.2228	0.2940	2460.0
3000.0	1.295	1180.0	0.300	598.4	814.1	1.802	0.2295	0.3005	2677.0
3500.0	1.507	1370.0	0.257	714.4	965.6	1.848	0.2342	0.3052	2879.0

* TWO-PHASE BOUNDARY

900 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V - V(\partial P/\partial V)_T$ PSIA-CU FT/BTU	PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.35	207.0	15.7	97200.0	0.00227	0.0934	19.0	0.00370	1.46384	3.43
125.0	53.23	198.0	14.4	84300.0	0.00240	0.0905	16.4	0.00359	1.45785	3.09
130.0	52.58	188.0	13.6	73700.0	0.00252	0.0876	14.4	0.00350	1.45161	2.82
135.0	51.90	180.0	12.9	65000.0	0.00265	0.0847	13.0	0.00343	1.44516	2.64
140.0	51.20	172.0	12.4	57600.0	0.00277	0.0818	12.0	0.00335	1.43850	2.51
145.0	50.48	165.0	11.8	51300.0	0.00290	0.0789	11.0	0.00328	1.43165	2.40
150.0	49.74	158.0	11.4	45700.0	0.00302	0.0761	10.1	0.00320	1.42462	2.27
155.0	48.98	152.0	10.9	40900.0	0.00315	0.0733	9.35	0.00312	1.41741	2.20
160.0	48.20	146.0	10.5	36500.0	0.00329	0.0705	8.69	0.00304	1.41003	2.14
165.0	47.39	141.0	10.1	32600.0	0.00344	0.0678	8.07	0.00295	1.40246	2.08
170.0	46.56	135.0	9.63	29000.0	0.00361	0.0651	7.50	0.00286	1.39470	2.03
175.0	45.71	130.0	9.22	25800.0	0.00379	0.0625	6.96	0.00277	1.38672	1.98
180.0	44.83	125.0	8.82	22800.0	0.00400	0.0599	6.45	0.00267	1.37851	1.94
185.0	43.92	120.0	8.43	20000.0	0.00423	0.0574	5.96	0.00257	1.37005	1.90
190.0	42.97	115.0	8.04	17500.0	0.00449	0.0549	5.53	0.00247	1.36129	1.87
200.0	40.96	105.0	7.29	13100.0	0.00515	0.0499	4.70	0.00226	1.34273	1.83
205.0	39.87	99.4	6.92	11100.0	0.00559	0.0475	4.32	0.00214	1.33281	1.82
210.0	38.72	93.9	6.55	9310.0	0.00611	0.0451	3.95	0.00203	1.32235	1.81
215.0	37.50	88.2	6.17	7660.0	0.00678	0.0427	3.60	0.00190	1.31124	1.81
220.0	36.17	82.2	5.79	6140.0	0.00765	0.0404	3.26	0.00178	1.29930	1.82
225.0	34.72	75.9	5.41	4770.0	0.00883	0.0382	2.92	0.00164	1.28626	1.85
230.0	33.09	69.2	5.00	3530.0	0.0105	0.0362	2.60	0.00150	1.27174	1.88
235.0	31.21	62.2	4.57	2470.0	0.0130	0.0343	2.27	0.00135	1.25514	1.93
240.0	26.98	55.3	4.12	1620.0	0.0168	0.0324	1.95	0.00120	1.23564	2.02
245.0	26.33	49.1	3.68	1030.0	0.0217	0.0301	1.65	0.00107	1.21263	2.10
250.0	23.38	44.9	3.31	714.0	0.0252	0.0273	1.40	0.00103	1.18745	2.09
255.0	20.58	43.1	3.08	583.0	0.0253	0.0244	1.22	0.00109	1.16377	1.97
260.0	18.23	42.8	2.96	540.0	0.0230	0.0219	1.12	0.00122	1.14417	1.81
265.0	16.38	43.4	2.89	538.0	0.0198	0.0199	1.06	0.00141	1.12890	1.65
270.0	14.94	44.5	2.85	556.0	0.0169	0.0183	1.02	0.00163	1.11716	1.51
275.0	13.81	46.0	2.82	580.0	0.0145	0.0172	1.00	0.00186	1.10801	1.39
280.0	12.91	47.6	2.79	606.0	0.0127	0.0163	0.981	0.00210	1.10068	1.31
285.0	12.16	49.3	2.77	630.0	0.0112	0.0157	0.972	0.00233	1.09468	1.24
290.0	11.53	51.1	2.76	653.0	0.0101	0.0152	0.967	0.00256	1.08963	1.18
295.0	11.00	52.9	2.74	673.0	0.00912	0.0148	0.964	0.00279	1.08532	1.13
300.0	10.53	54.6	2.73	692.0	0.00836	0.0145	0.964	0.00302	1.08158	1.09
310.0	9.742	58.2	2.70	724.0	0.00719	0.0142	0.967	0.00348	1.07534	1.03
320.0	9.107	61.7	2.67	750.0	0.00634	0.0140	0.974	0.00394	1.07031	0.977
330.0	8.577	65.1	2.65	771.0	0.00563	0.0140	0.983	0.00439	1.06612	0.939
340.0	8.124	68.5	2.63	789.0	0.00517	0.0140	0.995	0.00485	1.06255	0.909
350.0	7.731	71.9	2.61	804.0	0.00476	0.0140	1.01	0.00530	1.05947	0.885
360.0	7.385	75.2	2.60	817.0	0.00441	0.0141	1.02	0.00575	1.05675	0.865
370.0	7.077	78.4	2.58	829.0	0.00412	0.0142	1.03	0.00620	1.05434	0.849
380.0	6.800	81.6	2.57	838.0	0.00387	0.0143	1.05	0.00665	1.05217	0.836
390.0	6.549	84.8	2.55	847.0	0.00366	0.0145	1.06	0.00710	1.05021	0.824
400.0	6.320	88.0	2.54	854.0	0.00347	0.0145	1.08	0.00755	1.04842	0.814
410.0	6.110	91.1	2.53	861.0	0.00330	0.0147	1.09	0.00800	1.04679	0.806
420.0	5.916	94.2	2.51	867.0	0.00315	0.0148	1.11	0.00846	1.04528	0.799
430.0	5.737	97.3	2.50	872.0	0.00301	0.0150	1.13	0.00892	1.04388	0.792
440.0	5.570	100.0	2.49	877.0	0.00289	0.0152	1.14	0.00938	1.04259	0.787
450.0	5.414	103.0	2.48	882.0	0.00278	0.0153	1.16	0.00984	1.04138	0.782
460.0	5.268	106.0	2.47	885.0	0.00268	0.0155	1.17	0.0103	1.04025	0.777
470.0	5.131	109.0	2.46	889.0	0.00259	0.0157	1.19	0.0108	1.03919	0.773
480.0	5.002	112.0	2.45	892.0	0.00250	0.0158	1.21	0.0113	1.03819	0.770
490.0	4.881	115.0	2.45	895.0	0.00242	0.0160	1.22	0.0118	1.03725	0.766
500.0	4.766	118.0	2.44	898.0	0.00235	0.0162	1.24	0.0122	1.03636	0.763
510.0	4.657	121.0	2.43	900.0	0.00228	0.0164	1.25	0.0127	1.03552	0.761
520.0	4.554	124.0	2.42	902.0	0.00221	0.0165	1.27	0.0132	1.03472	0.758
530.0	4.455	127.0	2.42	904.0	0.00215	0.0167	1.28	0.0137	1.03396	0.756
540.0	4.361	130.0	2.41	906.0	0.00210	0.0169	1.30	0.0142	1.03324	0.754
550.0	4.272	133.0	2.40	908.0	0.00204	0.0171	1.32	0.0147	1.03255	0.752
560.0	4.187	135.0	2.40	909.0	0.00199	0.0173	1.33	0.0153	1.03189	0.750
570.0	4.105	138.0	2.39	911.0	0.00195	0.0174	1.35	0.0158	1.03126	0.748
580.0	4.027	141.0	2.39	912.0	0.00190	0.0176	1.36	0.0163	1.03066	0.746
590.0	3.952	144.0	2.38	913.0	0.00186	0.0178	1.38	0.0168	1.03008	0.745
600.0	3.880	147.0	2.38	914.0	0.00182	0.0180	1.39	0.0174	1.02953	0.743
700.0	3.291	175.0	2.33	922.0	0.00150	0.0198	1.54	0.0230	1.02501	0.733
800.0	2.866	203.0	2.28	925.0	0.00128	0.0216	1.68	0.0291	1.02175	0.726
900.0	2.542	231.0	2.24	926.0	0.00112	0.0234	1.81	0.0356	1.01928	0.722
1000.0	2.287	259.0	2.20	926.0	0.00100	0.0252	1.94	0.0425	1.01733	0.719
1500.0	1.529	413.0	1.99	922.0	0.000658					
2000.0	1.152	578.0	1.84	918.0	0.000492					
2500.0	0.9246	746.0	1.75	915.0	0.000394					
3000.0	0.7724	914.0	1.69	913.0	0.000329					
3500.0	0.6634	1080.0	1.66	911.0	0.000282					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

950 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01855	1810.0	221.0	-62.60	-53.34	0.5981	0.2632	0.4686	3869.0
125.0	0.01878	1590.0	202.0	-60.28	-56.98	0.6173	0.2640	0.4731	3636.0
130.0	0.01901	1410.0	186.0	-57.95	-54.61	0.6359	0.2615	0.4749	3446.0
135.0	0.01925	1260.0	172.0	-55.62	-52.23	0.6538	0.2576	0.4755	3284.0
140.0	0.01951	1130.0	160.0	-53.29	-49.86	0.6711	0.2532	0.4757	3141.0
145.0	0.01973	1020.0	149.0	-50.96	-47.48	0.6878	0.2489	0.4760	3012.0
150.0	0.02008	928.0	139.0	-48.63	-45.10	0.7040	0.2450	0.4767	2893.0
155.0	0.02033	843.0	129.0	-46.30	-42.71	0.7196	0.2415	0.4780	2781.0
160.0	0.02072	767.0	121.0	-43.96	-40.31	0.7348	0.2385	0.4802	2674.0
165.0	0.02107	697.0	113.0	-41.61	-37.91	0.7497	0.2360	0.4832	2571.0
170.0	0.02144	632.0	105.0	-39.25	-35.48	0.7641	0.2338	0.4872	2470.0
175.0	0.02183	573.0	98.2	-36.87	-33.03	0.7783	0.2320	0.4921	2372.0
180.0	0.02226	517.0	91.6	-34.47	-30.56	0.7923	0.2304	0.4981	2276.0
185.0	0.02271	465.0	85.3	-32.04	-28.05	0.8060	0.2291	0.5053	2181.0
190.0	0.02321	417.0	79.3	-29.58	-25.50	0.8196	0.2279	0.5138	2087.0
200.0	0.02432	329.0	68.1	-24.54	-20.26	0.8465	0.2260	0.5356	1900.0
205.0	0.02497	289.0	62.9	-21.94	-17.55	0.8599	0.2253	0.5497	1806.0
210.0	0.02563	251.0	57.8	-19.28	-14.76	0.8733	0.2247	0.5668	1711.0
215.0	0.02650	215.0	52.8	-16.54	-11.87	0.8869	0.2242	0.5880	1615.0
220.0	0.02743	181.0	48.0	-13.70	-8.879	0.9007	0.2239	0.6150	1516.0
225.0	0.02852	148.0	43.2	-10.73	-5.720	0.9149	0.2239	0.6504	1414.0
230.0	0.02982	118.0	38.5	-7.601	-2.355	0.9297	0.2242	0.6980	1307.0
235.0	0.03145	91.0	33.7	-4.242	1.289	0.9454	0.2249	0.7636	1196.0
240.0	0.03356	67.2	29.0	-0.5842	5.319	0.9623	0.2262	0.8524	1083.0
245.0	0.03640	48.9	24.4	3.440	9.844	0.9810	0.2282	0.9579	974.8
250.0	0.04022	37.5	20.1	7.781	14.86	1.001	0.2302	1.037	885.3
255.0	0.04499	32.7	16.6	12.17	20.09	1.022	0.2310	1.040	826.5
260.0	0.05037	32.1	14.0	16.29	25.15	1.042	0.2296	0.9767	795.8
265.0	0.05594	34.0	12.1	19.96	29.80	1.059	0.2264	0.8834	783.6
270.0	0.06140	37.3	10.6	23.18	33.98	1.075	0.2225	0.7875	782.1
275.0	0.06660	41.4	9.44	25.98	37.70	1.089	0.2184	0.7036	786.6
280.0	0.07150	46.0	8.54	28.46	41.04	1.101	0.2145	0.6353	794.3
285.0	0.07611	50.7	7.83	30.69	44.08	1.111	0.2111	0.5809	803.8
290.0	0.08046	55.3	7.24	32.71	46.87	1.121	0.2080	0.5377	814.1
295.0	0.08459	59.9	6.76	34.59	49.47	1.130	0.2053	0.5030	824.8
300.0	0.08854	64.4	6.34	36.33	51.91	1.138	0.2030	0.4748	835.6
310.0	0.09595	73.0	5.68	39.55	56.43	1.153	0.1990	0.4322	857.2
320.0	0.1029	81.2	5.16	42.49	60.59	1.166	0.1959	0.4018	878.1
330.0	0.1095	88.9	4.75	45.24	64.49	1.178	0.1935	0.3792	898.2
340.0	0.1157	96.2	4.41	47.84	68.19	1.189	0.1915	0.3618	917.6
350.0	0.1217	103.0	4.12	50.32	71.74	1.200	0.1899	0.3481	936.3
360.0	0.1276	110.0	3.88	52.72	75.17	1.209	0.1886	0.3371	954.2
370.0	0.1332	116.0	3.67	55.05	78.49	1.218	0.1875	0.3280	971.6
380.0	0.1388	123.0	3.48	57.32	81.73	1.227	0.1865	0.3204	988.3
390.0	0.1442	129.0	3.32	59.54	84.90	1.235	0.1857	0.3139	1005.0
400.0	0.1495	135.0	3.17	61.72	88.01	1.243	0.1850	0.3084	1020.0
410.0	0.1547	141.0	3.04	63.86	91.07	1.251	0.1844	0.3036	1036.0
420.0	0.1598	146.0	2.92	65.97	94.09	1.258	0.1839	0.2995	1051.0
430.0	0.1649	152.0	2.81	68.06	97.06	1.265	0.1835	0.2958	1065.0
440.0	0.1699	157.0	2.71	70.12	100.0	1.272	0.1831	0.2925	1079.0
450.0	0.1748	163.0	2.61	72.16	102.9	1.278	0.1827	0.2897	1093.0
460.0	0.1797	168.0	2.53	74.19	105.8	1.285	0.1824	0.2871	1107.0
470.0	0.1845	173.0	2.45	76.20	108.7	1.291	0.1822	0.2847	1120.0
480.0	0.1893	178.0	2.38	78.19	111.5	1.297	0.1819	0.2826	1133.0
490.0	0.1940	184.0	2.31	80.17	114.3	1.303	0.1817	0.2807	1146.0
500.0	0.1988	189.0	2.24	82.14	117.1	1.308	0.1815	0.2790	1159.0
510.0	0.2034	194.0	2.18	84.10	119.9	1.314	0.1813	0.2774	1171.0
520.0	0.2081	198.0	2.12	86.05	122.7	1.319	0.1812	0.2759	1183.0
530.0	0.2127	203.0	2.07	87.99	125.4	1.324	0.1810	0.2746	1195.0
540.0	0.2173	208.0	2.02	89.92	128.1	1.329	0.1809	0.2734	1207.0
550.0	0.2219	213.0	1.97	91.84	130.9	1.334	0.1808	0.2722	1219.0
560.0	0.2264	218.0	1.92	93.76	133.6	1.339	0.1807	0.2712	1230.0
570.0	0.2309	222.0	1.88	95.67	136.3	1.344	0.1806	0.2702	1241.0
580.0	0.2354	227.0	1.84	97.58	139.0	1.349	0.1805	0.2693	1253.0
590.0	0.2399	232.0	1.80	99.48	141.7	1.353	0.1805	0.2684	1264.0
600.0	0.2444	236.0	1.76	101.4	144.4	1.358	0.1804	0.2677	1274.0
700.0	0.2882	281.0	1.46	120.1	170.8	1.399	0.1803	0.2623	1376.0
800.0	0.3311	324.0	1.25	138.7	196.9	1.434	0.1811	0.2600	1467.0
900.0	0.3732	365.0	1.10	157.2	222.9	1.464	0.1826	0.2594	1551.0
1000.0	0.4150	406.0	0.981	175.9	248.9	1.491	0.1847	0.2602	1628.0
1500.0	0.6203	605.0	0.640	272.4	381.6	1.599	0.1994	0.2718	1954.0
2000.0	0.8233	799.0	0.477	375.9	520.8	1.679	0.2130	0.2846	2223.0
2500.0	1.026	991.0	0.381	485.1	665.5	1.744	0.2228	0.2940	2462.0
3000.0	1.227	1180.0	0.317	598.4	814.3	1.798	0.2295	0.3006	2679.0
3500.0	1.429	1370.0	0.271	714.4	965.8	1.844	0.2342	0.3052	2881.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

350 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.88	208.0	15.6	97800.0	0.00225	0.0935	19.1	0.00370	1.46411	3.45
125.0	53.26	199.0	14.4	84600.0	0.00233	0.0906	16.5	0.00360	1.45815	3.10
130.0	52.61	189.0	13.5	74200.0	0.00251	0.0877	14.5	0.00351	1.45195	2.83
135.0	51.94	181.0	12.9	65500.0	0.00263	0.0848	13.1	0.00344	1.44554	2.64
140.0	51.25	173.0	12.3	58100.0	0.00275	0.0820	12.0	0.00336	1.43892	2.52
145.0	50.53	166.0	11.8	51700.0	0.00287	0.0791	11.1	0.00329	1.43212	2.41
150.0	49.79	159.0	11.4	46200.0	0.00300	0.0763	10.1	0.00321	1.42513	2.28
155.0	49.04	153.0	10.9	41400.0	0.00313	0.0735	9.41	0.00313	1.41798	2.20
160.0	48.26	147.0	10.5	37000.0	0.00326	0.0707	8.75	0.00305	1.41065	2.14
165.0	47.46	142.0	10.1	33100.0	0.00341	0.0680	8.13	0.00297	1.40314	2.08
170.0	46.64	137.0	9.65	29500.0	0.00357	0.0654	7.55	0.00288	1.39544	2.03
175.0	45.80	131.0	9.24	26200.0	0.00374	0.0628	7.01	0.00279	1.38754	1.98
180.0	44.93	126.0	8.85	23200.0	0.00394	0.0602	6.51	0.00269	1.37942	1.94
185.0	44.03	121.0	8.46	20500.0	0.00416	0.0577	6.03	0.00259	1.37105	1.90
190.0	43.09	116.0	8.08	18000.0	0.00441	0.0552	5.58	0.00249	1.36241	1.87
200.0	41.11	106.0	7.33	13500.0	0.00504	0.0503	4.76	0.00229	1.34414	1.82
205.0	40.05	101.0	6.97	11600.0	0.00544	0.0479	4.38	0.00218	1.33442	1.81
210.0	38.93	95.7	6.61	9750.0	0.00592	0.0455	4.02	0.00206	1.32421	1.80
215.0	37.74	90.1	6.25	8100.0	0.00652	0.0432	3.67	0.00195	1.31340	1.80
220.0	36.46	84.4	5.86	6580.0	0.00723	0.0409	3.33	0.00182	1.30187	1.80
225.0	35.07	78.3	5.51	5210.0	0.00833	0.0387	3.00	0.00170	1.28939	1.82
230.0	33.53	72.0	5.12	3970.0	0.00963	0.0367	2.68	0.00157	1.27569	1.84
235.0	31.80	65.5	4.72	2890.0	0.0117	0.0349	2.37	0.00144	1.26033	1.87
240.0	29.80	58.9	4.30	2000.0	0.0145	0.0330	2.06	0.00130	1.24275	1.92
245.0	27.47	52.8	3.89	1340.0	0.0181	0.0310	1.77	0.00118	1.22250	1.97
250.0	24.86	48.1	3.51	933.0	0.0216	0.0285	1.52	0.00111	1.20005	1.99
255.0	22.23	45.5	3.24	726.0	0.0229	0.0258	1.32	0.00112	1.17763	1.92
260.0	19.85	44.4	3.08	638.0	0.0220	0.0233	1.20	0.00120	1.15770	1.81
265.0	17.88	44.5	2.98	607.0	0.0199	0.0211	1.12	0.00134	1.14127	1.68
270.0	16.29	45.2	2.92	607.0	0.0174	0.0195	1.07	0.00152	1.12817	1.55
275.0	15.02	46.4	2.88	622.0	0.0152	0.0182	1.03	0.00172	1.11777	1.44
280.0	13.99	47.8	2.85	643.0	0.0133	0.0172	1.01	0.00193	1.10940	1.35
285.0	13.14	49.4	2.82	666.0	0.0118	0.0164	1.00	0.00215	1.10254	1.27
290.0	12.43	51.1	2.80	688.0	0.0105	0.0158	0.991	0.00237	1.09681	1.21
295.0	11.82	52.8	2.78	709.0	0.00954	0.0154	0.986	0.00259	1.09193	1.16
300.0	11.29	54.5	2.77	728.0	0.00872	0.0150	0.983	0.00280	1.08772	1.12
310.0	10.42	58.0	2.74	761.0	0.00746	0.0146	0.983	0.00324	1.08074	1.05
320.0	9.719	61.4	2.71	789.0	0.00654	0.0144	0.988	0.00368	1.07516	0.994
330.0	9.136	64.8	2.69	812.0	0.00585	0.0143	1.00	0.00412	1.07054	0.953
340.0	8.642	68.2	2.66	831.0	0.00530	0.0142	1.01	0.00455	1.06663	0.920
350.0	8.214	71.6	2.64	848.0	0.00486	0.0143	1.02	0.00499	1.06326	0.894
360.0	7.839	74.9	2.62	862.0	0.00450	0.0143	1.03	0.00542	1.06031	0.873
370.0	7.505	78.2	2.61	874.0	0.00420	0.0144	1.04	0.00585	1.05769	0.856
380.0	7.207	81.4	2.59	885.0	0.00394	0.0145	1.06	0.00628	1.05535	0.841
390.0	6.936	84.6	2.58	894.0	0.00371	0.0146	1.07	0.00671	1.05324	0.829
400.0	6.690	87.7	2.56	902.0	0.00351	0.0147	1.09	0.00714	1.05131	0.819
410.0	6.465	90.9	2.55	909.0	0.00334	0.0149	1.10	0.00758	1.04955	0.810
420.0	6.258	94.0	2.53	916.0	0.00319	0.0150	1.12	0.00801	1.04794	0.802
430.0	6.066	97.1	2.52	922.0	0.00305	0.0152	1.13	0.00845	1.04644	0.795
440.0	5.887	100.0	2.51	927.0	0.00292	0.0153	1.15	0.00889	1.04505	0.789
450.0	5.721	103.0	2.50	931.0	0.00281	0.0155	1.16	0.00934	1.04376	0.784
460.0	5.566	106.0	2.49	936.0	0.00270	0.0156	1.18	0.00979	1.04256	0.780
470.0	5.420	109.0	2.48	939.0	0.00261	0.0158	1.20	0.0102	1.04142	0.775
480.0	5.283	112.0	2.47	943.0	0.00252	0.0160	1.21	0.0107	1.04036	0.772
490.0	5.153	115.0	2.46	946.0	0.00244	0.0161	1.23	0.0112	1.03936	0.768
500.0	5.031	118.0	2.45	949.0	0.00236	0.0163	1.24	0.0116	1.03841	0.765
510.0	4.915	121.0	2.45	951.0	0.00229	0.0165	1.26	0.0121	1.03752	0.762
520.0	4.806	124.0	2.44	954.0	0.00223	0.0167	1.27	0.0126	1.03667	0.759
530.0	4.701	127.0	2.43	956.0	0.00217	0.0168	1.29	0.0130	1.03586	0.757
540.0	4.602	130.0	2.43	958.0	0.00211	0.0170	1.30	0.0135	1.03509	0.755
550.0	4.507	133.0	2.42	960.0	0.00205	0.0172	1.32	0.0140	1.03436	0.753
560.0	4.417	135.0	2.41	961.0	0.00200	0.0174	1.34	0.0145	1.03366	0.751
570.0	4.330	138.0	2.41	963.0	0.00195	0.0175	1.35	0.0150	1.03300	0.749
580.0	4.247	141.0	2.40	964.0	0.00191	0.0177	1.37	0.0155	1.03236	0.747
590.0	4.168	144.0	2.39	966.0	0.00186	0.0179	1.38	0.0160	1.03175	0.746
600.0	4.092	147.0	2.39	967.0	0.00182	0.0181	1.40	0.0165	1.03116	0.744
700.0	3.469	175.0	2.34	974.0	0.00150	0.0199	1.54	0.0218	1.02637	0.733
800.0	3.021	203.0	2.29	978.0	0.00128	0.0217	1.68	0.0276	1.02293	0.726
900.0	2.679	231.0	2.25	979.0	0.00112	0.0235	1.82	0.0338	1.02032	0.722
1000.0	2.410	260.0	2.20	979.0	0.00100	0.0253	1.94	0.0404	1.01827	0.719
1500.0	1.612	414.0	1.99	975.0	0.000657					
2000.0	1.215	578.0	1.84	970.0	0.000492					
2500.0	0.9751	746.0	1.75	967.0	0.000394					
3000.0	0.8147	914.0	1.69	964.0	0.000329					
3500.0	0.6997	1080.0	1.66	962.0	0.000282					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01855	1820.0	220.0	-62.65	-59.21	0.5977	0.2643	0.4680	3869.0
125.0	0.01877	1600.0	202.0	-60.33	-56.86	0.6169	0.2650	0.4724	3637.0
130.0	0.01993	1420.0	186.0	-58.01	-54.49	0.6355	0.2624	0.4742	3448.0
135.0	0.01924	1270.0	172.0	-55.68	-52.12	0.6534	0.2584	0.4747	3287.0
140.0	0.01950	1140.0	160.0	-53.36	-49.74	0.6706	0.2539	0.4749	3146.0
145.0	0.01977	1030.0	149.0	-51.03	-47.37	0.6873	0.2496	0.4751	3018.0
150.0	0.02006	937.0	139.0	-48.71	-44.99	0.7034	0.2456	0.4757	2900.0
155.0	0.02037	852.0	130.0	-46.38	-42.61	0.7190	0.2421	0.4770	2789.0
160.0	0.02069	775.0	121.0	-44.05	-40.22	0.7342	0.2391	0.4790	2683.0
165.0	0.02104	705.0	113.0	-41.72	-37.82	0.7490	0.2365	0.4819	2581.0
170.0	0.02140	641.0	106.0	-39.36	-35.40	0.7634	0.2343	0.4856	2481.0
175.0	0.02179	582.0	98.7	-37.00	-32.96	0.7776	0.2324	0.4903	2384.0
180.0	0.02221	526.0	92.1	-34.61	-30.50	0.7915	0.2308	0.4961	2289.0
185.0	0.02265	475.0	85.9	-32.20	-28.00	0.8052	0.2294	0.5029	2195.0
190.0	0.02314	426.0	80.0	-29.75	-25.47	0.8187	0.2282	0.5109	2103.0
200.0	0.02424	338.0	68.9	-24.75	-20.26	0.8454	0.2262	0.5313	1919.0
205.0	0.02486	298.0	63.7	-22.18	-17.57	0.8586	0.2254	0.5443	1827.0
210.0	0.02555	261.0	58.6	-19.55	-14.81	0.8719	0.2248	0.5600	1734.0
215.0	0.02634	225.0	53.8	-16.84	-11.97	0.8853	0.2242	0.5791	1641.0
220.0	0.02723	191.0	49.0	-14.06	-9.023	0.8989	0.2239	0.6031	1545.0
225.0	0.02825	159.0	44.3	-11.16	-5.934	0.9128	0.2237	0.6337	1446.0
230.0	0.02947	130.0	39.7	-8.127	-2.671	0.9271	0.2237	0.6737	1345.0
235.0	0.03094	102.0	35.1	-4.906	0.3233	0.9422	0.2242	0.7268	1240.0
240.0	0.03280	78.4	30.6	-1.449	4.624	0.9582	0.2251	0.7963	1134.0
245.0	0.03521	59.0	26.2	2.290	9.310	0.9754	0.2264	0.8793	1030.0
250.0	0.03835	45.6	22.0	6.300	13.40	0.9940	0.2281	0.9533	939.3
255.0	0.04230	38.3	18.5	10.43	18.26	1.013	0.2291	0.9806	872.1
260.0	0.04683	35.8	15.6	14.43	23.11	1.032	0.2286	0.9511	831.0
265.0	0.05180	36.2	13.5	18.12	27.71	1.050	0.2265	0.8858	810.0
270.0	0.05673	38.4	11.8	21.43	31.95	1.065	0.2233	0.8070	802.0
275.0	0.06165	41.7	10.5	24.37	35.79	1.080	0.2196	0.7301	801.8
280.0	0.06632	45.7	9.46	26.98	39.27	1.092	0.2160	0.6626	806.3
285.0	0.07075	50.1	8.64	29.33	42.43	1.103	0.2125	0.6064	813.5
290.0	0.07497	54.5	7.96	31.46	45.35	1.113	0.2094	0.5605	822.3
295.0	0.07897	59.0	7.40	33.43	48.05	1.123	0.2067	0.5232	831.9
300.0	0.08280	63.4	6.93	35.26	50.59	1.131	0.2042	0.4925	841.9
310.0	0.09000	72.0	6.17	38.60	55.27	1.147	0.2001	0.4460	862.4
320.0	0.09672	80.2	5.59	41.64	59.55	1.160	0.1969	0.4128	882.6
330.0	0.1031	88.0	5.13	44.47	63.55	1.172	0.1943	0.3882	902.4
340.0	0.1091	95.4	4.75	47.13	67.34	1.184	0.1922	0.3693	921.5
350.0	0.1149	102.0	4.43	49.67	70.95	1.194	0.1905	0.3545	940.0
360.0	0.1206	109.0	4.16	52.11	74.44	1.204	0.1891	0.3425	957.9
370.0	0.1260	116.0	3.93	54.48	77.81	1.213	0.1879	0.3327	975.1
380.0	0.1313	122.0	3.72	56.78	81.10	1.222	0.1870	0.3246	991.9
390.0	0.1365	129.0	3.54	59.02	84.31	1.230	0.1861	0.3177	1008.0
400.0	0.1416	135.0	3.38	61.23	87.45	1.238	0.1854	0.3118	1024.0
410.0	0.1466	140.0	3.24	63.39	90.54	1.246	0.1848	0.3067	1039.0
420.0	0.1515	146.0	3.11	65.53	93.59	1.253	0.1842	0.3022	1054.0
430.0	0.1564	152.0	2.99	67.63	96.59	1.260	0.1838	0.2983	1069.0
440.0	0.1612	157.0	2.88	69.71	99.6	1.267	0.1834	0.2949	1083.0
450.0	0.1659	163.0	2.78	71.77	102.5	1.274	0.1830	0.2918	1097.0
460.0	0.1706	168.0	2.69	73.81	105.4	1.280	0.1827	0.2891	1110.0
470.0	0.1752	173.0	2.60	75.83	108.3	1.286	0.1824	0.2866	1124.0
480.0	0.1798	179.0	2.52	77.84	111.1	1.292	0.1821	0.2844	1137.0
490.0	0.1843	184.0	2.45	79.83	114.0	1.298	0.1819	0.2824	1150.0
500.0	0.1888	189.0	2.38	81.81	116.8	1.304	0.1817	0.2805	1162.0
510.0	0.1933	194.0	2.31	83.78	119.6	1.309	0.1815	0.2789	1175.0
520.0	0.1977	199.0	2.25	85.74	122.4	1.315	0.1813	0.2773	1187.0
530.0	0.2021	204.0	2.19	87.69	125.1	1.320	0.1812	0.2759	1199.0
540.0	0.2065	209.0	2.14	89.63	127.9	1.325	0.1811	0.2746	1211.0
550.0	0.2109	213.0	2.09	91.56	130.6	1.330	0.1809	0.2734	1222.0
560.0	0.2152	218.0	2.04	93.48	133.3	1.335	0.1808	0.2723	1234.0
570.0	0.2195	223.0	1.99	95.40	136.1	1.340	0.1807	0.2713	1245.0
580.0	0.2238	228.0	1.95	97.31	138.8	1.345	0.1807	0.2703	1256.0
590.0	0.2281	232.0	1.90	99.22	141.5	1.349	0.1806	0.2694	1267.0
600.0	0.2324	237.0	1.86	101.1	144.2	1.354	0.1805	0.2686	1278.0
700.0	0.2742	282.0	1.54	119.9	170.7	1.395	0.1804	0.2630	1379.0
800.0	0.3150	325.0	1.32	138.5	196.8	1.430	0.1812	0.2604	1471.0
900.0	0.3551	367.0	1.16	157.1	222.8	1.460	0.1827	0.2598	1554.0
1000.0	0.3948	408.0	1.03	175.7	248.9	1.488	0.1848	0.2604	1632.0
1500.0	0.5901	606.0	0.674	272.4	381.6	1.595	0.1994	0.2720	1957.0
2000.0	0.7830	800.0	0.502	375.9	520.9	1.675	0.2130	0.2846	2226.0
2500.0	0.9751	993.0	0.401	485.1	665.7	1.740	0.2228	0.2940	2464.0
3000.0	1.167	1180.0	0.334	598.4	814.4	1.794	0.2295	0.3006	2681.0
3500.0	1.359	1360.0	0.286	714.4	966.0	1.841	0.2342	0.3052	2883.0

* TWO-PHASE BOUNDARY

1000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DV)$_T$ PSIA-CU FT/BTU	-V(DP/DV)$_T$ PSIA	(DV/DT)/V$_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.31	209.0	15.5	98300.0	0.00224	0.0936	19.3	0.00371	1.46437	3.46
125.0	53.29	200.0	14.3	85400.0	0.00237	0.0908	16.6	0.00361	1.45845	3.11
130.0	52.65	191.0	13.5	74800.0	0.00249	0.0879	14.6	0.00352	1.45229	2.84
135.0	51.98	182.0	12.8	66000.0	0.00261	0.0850	13.2	0.00345	1.44592	2.65
140.0	51.29	174.0	12.3	58600.0	0.00273	0.0821	12.1	0.00337	1.43934	2.52
145.0	50.58	167.0	11.8	52200.0	0.00285	0.0793	11.2	0.00330	1.43258	2.41
150.0	49.85	160.0	11.3	46700.0	0.00297	0.0765	10.2	0.00322	1.42564	2.28
155.0	49.10	154.0	10.9	41800.0	0.00310	0.0737	9.46	0.00315	1.41853	2.20
160.0	48.33	148.0	10.5	37500.0	0.00323	0.0710	8.80	0.00307	1.41126	2.14
165.0	47.54	143.0	10.1	33500.0	0.00337	0.0683	8.18	0.00298	1.40381	2.08
170.0	46.72	138.0	9.66	30000.0	0.00353	0.0657	7.61	0.00289	1.39618	2.03
175.0	45.89	133.0	9.26	26700.0	0.00370	0.0631	7.07	0.00280	1.38835	1.98
180.0	45.02	128.0	8.87	23700.0	0.00389	0.0605	6.56	0.00271	1.38031	1.94
185.0	44.13	123.0	8.49	20900.0	0.00410	0.0580	6.09	0.00261	1.37204	1.90
190.0	43.21	118.0	8.11	18400.0	0.00434	0.0555	5.64	0.00252	1.36350	1.87
200.0	41.26	108.0	7.38	14000.0	0.00493	0.0507	4.82	0.00231	1.34552	1.82
205.0	40.22	103.0	7.02	12000.0	0.00531	0.0483	4.44	0.00221	1.33597	1.80
210.0	39.12	97.4	6.67	10200.0	0.00575	0.0460	4.08	0.00210	1.32599	1.79
215.0	37.96	92.0	6.31	8540.0	0.00630	0.0436	3.73	0.00198	1.31546	1.78
220.0	36.73	86.4	5.96	7020.0	0.00698	0.0414	3.40	0.00187	1.30429	1.78
225.0	35.39	80.6	5.60	5640.0	0.00786	0.0393	3.08	0.00175	1.29230	1.79
230.0	33.94	74.6	5.23	4400.0	0.00903	0.0373	2.77	0.00163	1.27928	1.80
235.0	32.32	68.4	4.85	3310.0	0.0106	0.0354	2.46	0.00151	1.26490	1.82
240.0	30.49	62.2	4.46	2390.0	0.0128	0.0336	2.17	0.00139	1.24878	1.85
245.0	28.40	56.3	4.07	1680.0	0.0156	0.0317	1.89	0.00127	1.23057	1.88
250.0	26.07	51.4	3.70	1190.0	0.0185	0.0295	1.63	0.00119	1.21042	1.90
255.0	23.64	48.1	3.41	906.0	0.0204	0.0270	1.43	0.00117	1.18961	1.86
260.0	21.33	45.5	3.21	764.0	0.0205	0.0246	1.28	0.00121	1.17008	1.78
265.0	19.31	46.0	3.08	699.0	0.0193	0.0224	1.18	0.00131	1.15313	1.68
270.0	17.61	46.3	3.00	676.0	0.0174	0.0206	1.12	0.00145	1.13907	1.58
275.0	16.22	47.1	2.95	677.0	0.0155	0.0191	1.07	0.00162	1.12762	1.47
280.0	15.08	48.3	2.91	690.0	0.0137	0.0180	1.05	0.00180	1.11828	1.38
285.0	14.13	49.7	2.88	708.0	0.0122	0.0172	1.03	0.00200	1.11059	1.31
290.0	13.34	51.2	2.85	727.0	0.0110	0.0165	1.02	0.00220	1.10416	1.24
295.0	12.66	52.8	2.83	747.0	0.00991	0.0160	1.01	0.00241	1.09870	1.19
300.0	12.06	54.5	2.81	766.0	0.00905	0.0156	1.00	0.00262	1.09399	1.14
310.0	11.11	57.8	2.78	800.0	0.00771	0.0150	1.00	0.00304	1.08624	1.07
320.0	10.34	61.2	2.75	829.0	0.00674	0.0147	1.00	0.00346	1.08008	1.01
330.0	9.702	64.6	2.72	854.0	0.00601	0.0146	1.01	0.00388	1.07502	0.966
340.0	9.164	68.0	2.70	874.0	0.00543	0.0145	1.02	0.00430	1.07076	0.931
350.0	8.700	71.4	2.67	892.0	0.00497	0.0145	1.03	0.00471	1.06709	0.903
360.0	8.295	74.7	2.65	907.0	0.00459	0.0146	1.04	0.00513	1.06390	0.881
370.0	7.936	77.9	2.63	920.0	0.00427	0.0146	1.05	0.00554	1.06107	0.862
380.0	7.615	81.2	2.62	931.0	0.00400	0.0147	1.07	0.00595	1.05855	0.847
390.0	7.325	84.4	2.60	941.0	0.00376	0.0148	1.08	0.00637	1.05628	0.834
400.0	7.062	87.6	2.58	950.0	0.00356	0.0149	1.09	0.00678	1.05422	0.823
410.0	6.821	90.7	2.57	958.0	0.00338	0.0151	1.11	0.00720	1.05233	0.814
420.0	6.599	93.8	2.56	965.0	0.00322	0.0152	1.12	0.00762	1.05060	0.805
430.0	6.395	96.9	2.54	971.0	0.00308	0.0153	1.14	0.00804	1.04901	0.798
440.0	6.205	100.0	2.53	976.0	0.00295	0.0155	1.15	0.00846	1.04753	0.792
450.0	6.028	103.0	2.52	981.0	0.00283	0.0156	1.17	0.00888	1.04615	0.787
460.0	5.863	106.0	2.51	986.0	0.00273	0.0158	1.19	0.00931	1.04487	0.782
470.0	5.708	109.0	2.50	990.0	0.00263	0.0159	1.20	0.00975	1.04366	0.777
480.0	5.563	112.0	2.49	994.0	0.00254	0.0161	1.22	0.0102	1.04253	0.773
490.0	5.426	115.0	2.48	1000.0	0.00245	0.0163	1.23	0.0106	1.04147	0.770
500.0	5.296	118.0	2.47	1000.0	0.00238	0.0164	1.25	0.0111	1.04047	0.766
510.0	5.174	121.0	2.46	1000.0	0.00231	0.0166	1.26	0.0115	1.03952	0.763
520.0	5.057	124.0	2.45	1010.0	0.00224	0.0168	1.28	0.0120	1.03862	0.761
530.0	4.947	127.0	2.45	1010.0	0.00218	0.0170	1.29	0.0124	1.03776	0.758
540.0	4.842	130.0	2.44	1010.0	0.00212	0.0171	1.31	0.0129	1.03695	0.756
550.0	4.742	133.0	2.43	1010.0	0.00206	0.0173	1.32	0.0133	1.03617	0.754
560.0	4.646	135.0	2.43	1010.0	0.00201	0.0175	1.34	0.0138	1.03544	0.752
570.0	4.555	138.0	2.42	1020.0	0.00196	0.0177	1.36	0.0143	1.03473	0.750
580.0	4.467	141.0	2.41	1020.0	0.00192	0.0178	1.37	0.0148	1.03406	0.748
590.0	4.384	144.0	2.41	1020.0	0.00187	0.0180	1.39	0.0152	1.03341	0.746
600.0	4.303	147.0	2.40	1020.0	0.00183	0.0182	1.40	0.0157	1.03279	0.745
700.0	3.647	175.0	2.35	1030.0	0.00150	0.0200	1.55	0.0208	1.02774	0.734
800.0	3.175	203.0	2.30	1030.0	0.00128	0.0218	1.69	0.0263	1.02412	0.727
900.0	2.816	231.0	2.25	1030.0	0.00112	0.0235	1.82	0.0322	1.02137	0.722
1000.0	2.533	260.0	2.21	1030.0	0.00100	0.0254	1.94	0.0384	1.01920	0.719
1500.0	1.695	414.0	2.00	1030.0	0.000656					
2000.0	1.277	579.0	1.85	1020.0	0.000491					
2500.0	1.025	747.0	1.75	1020.0	0.000394					
3000.0	0.8570	915.0	1.70	1020.0	0.000329					
3500.0	0.7363	1080.0	1.66	1010.0	0.000282					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1100 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01853	1840.0	220.0	-62.73	-58.96	0.5969	0.2664	0.4668	3868.0
125.0	0.01874	1620.0	202.0	-60.43	-56.61	0.6161	0.2669	0.4711	3639.0
130.0	0.01897	1440.0	186.0	-58.12	-54.25	0.6346	0.2642	0.4728	3453.0
135.0	0.01921	1290.0	172.0	-55.80	-51.89	0.6525	0.2600	0.4733	3294.0
140.0	0.01945	1160.0	160.0	-53.49	-49.52	0.6697	0.2554	0.4733	3155.0
145.0	0.01973	1050.0	149.0	-51.17	-47.15	0.6863	0.2509	0.4734	3029.0
150.0	0.02002	954.0	140.0	-48.86	-44.79	0.7023	0.2468	0.4739	2913.0
155.0	0.02032	869.0	130.0	-46.55	-42.41	0.7179	0.2432	0.4750	2804.0
160.0	0.02064	793.0	122.0	-44.24	-40.04	0.7330	0.2401	0.4768	2700.0
165.0	0.02098	723.0	114.0	-41.92	-37.65	0.7477	0.2374	0.4793	2600.0
170.0	0.02133	659.0	107.0	-39.59	-35.24	0.7621	0.2351	0.4827	2503.0
175.0	0.02171	599.0	100.0	-37.24	-32.82	0.7761	0.2331	0.4870	2408.0
180.0	0.02212	544.0	93.3	-34.88	-30.37	0.7899	0.2315	0.4921	2315.0
185.0	0.02255	493.0	87.1	-32.49	-27.89	0.8035	0.2300	0.4983	2224.0
190.0	0.02302	445.0	81.2	-30.07	-25.39	0.8168	0.2287	0.5054	2134.0
200.0	0.02407	357.0	70.3	-25.15	-20.25	0.8432	0.2266	0.5234	1955.0
205.0	0.02467	318.0	65.2	-22.63	-17.60	0.8563	0.2257	0.5347	1867.0
210.0	0.02532	280.0	60.2	-20.05	-14.90	0.8693	0.2250	0.5480	1778.0
215.0	0.02605	245.0	55.5	-17.42	-12.12	0.8824	0.2243	0.5638	1689.0
220.0	0.02688	212.0	50.9	-14.72	-9.261	0.8955	0.2238	0.5830	1599.0
225.0	0.02779	180.0	46.4	-11.94	-6.289	0.9089	0.2234	0.6066	1507.0
230.0	0.02886	151.0	42.0	-9.064	-3.185	0.9225	0.2232	0.6361	1413.0
235.0	0.03012	124.0	37.6	-6.050	0.08396	0.9366	0.2232	0.6732	1318.0
240.0	0.03163	100.0	33.4	-2.881	3.561	0.9513	0.2235	0.7193	1222.0
245.0	0.03349	79.5	29.3	0.4682	7.291	0.9666	0.2241	0.7734	1128.0
250.0	0.03580	63.3	25.4	4.005	11.30	0.9828	0.2249	0.8284	1040.0
255.0	0.03865	52.3	21.8	7.677	15.55	1.000	0.2257	0.8678	965.2
260.0	0.04201	46.1	18.8	11.36	19.92	1.017	0.2259	0.8760	909.8
265.0	0.04573	43.5	16.3	14.93	24.25	1.033	0.2251	0.8523	873.5
270.0	0.04981	43.3	14.3	18.27	28.41	1.049	0.2233	0.8077	852.3
275.0	0.05392	44.8	12.7	21.33	32.32	1.063	0.2207	0.7533	841.9
280.0	0.05801	47.4	11.4	24.12	35.94	1.076	0.2177	0.6973	838.6
285.0	0.06201	50.7	10.4	26.66	39.30	1.088	0.2147	0.6450	840.0
290.0	0.06587	54.4	9.51	28.98	42.40	1.099	0.2117	0.5987	844.5
295.0	0.06959	58.4	8.79	31.12	45.29	1.109	0.2089	0.5589	850.9
300.0	0.07316	62.5	8.19	33.10	48.00	1.118	0.2064	0.5252	858.5
310.0	0.07992	70.8	7.23	36.70	52.98	1.134	0.2021	0.4725	875.8
320.0	0.08623	78.9	6.50	39.94	57.50	1.148	0.1986	0.4344	894.2
330.0	0.09213	86.7	5.92	42.92	61.69	1.161	0.1958	0.4059	912.7
340.0	0.09765	94.3	5.46	45.71	65.64	1.173	0.1936	0.3842	931.0
350.0	0.1033	101.0	5.07	48.35	69.39	1.184	0.1917	0.3671	948.9
360.0	0.1085	108.0	4.75	50.88	72.99	1.194	0.1902	0.3534	966.3
370.0	0.1136	115.0	4.47	53.33	76.47	1.204	0.1889	0.3422	983.3
380.0	0.1186	122.0	4.23	55.69	79.84	1.213	0.1878	0.3329	1000.0
390.0	0.1234	128.0	4.01	58.00	83.13	1.221	0.1869	0.3251	1016.0
400.0	0.1281	134.0	3.82	60.26	86.35	1.229	0.1861	0.3185	1031.0
410.0	0.1327	140.0	3.65	62.47	89.51	1.237	0.1854	0.3127	1047.0
420.0	0.1373	146.0	3.50	64.64	92.61	1.245	0.1848	0.3078	1062.0
430.0	0.1418	152.0	3.36	66.78	95.66	1.252	0.1843	0.3034	1076.0
440.0	0.1462	157.0	3.23	68.90	98.68	1.259	0.1839	0.2996	1090.0
450.0	0.1506	163.0	3.12	70.99	101.7	1.265	0.1835	0.2961	1104.0
460.0	0.1549	168.0	3.01	73.06	104.6	1.272	0.1831	0.2931	1118.0
470.0	0.1591	174.0	2.91	75.10	107.5	1.278	0.1828	0.2904	1131.0
480.0	0.1633	179.0	2.82	77.14	110.4	1.284	0.1825	0.2879	1144.0
490.0	0.1675	184.0	2.74	79.15	113.3	1.290	0.1823	0.2856	1157.0
500.0	0.1717	190.0	2.66	81.15	116.1	1.296	0.1821	0.2836	1169.0
510.0	0.1758	195.0	2.58	83.14	118.9	1.302	0.1819	0.2818	1182.0
520.0	0.1799	200.0	2.51	85.12	121.8	1.307	0.1817	0.2801	1194.0
530.0	0.1839	205.0	2.44	87.08	124.6	1.312	0.1815	0.2785	1206.0
540.0	0.1880	210.0	2.38	89.04	127.3	1.318	0.1814	0.2771	1218.0
550.0	0.1920	214.0	2.32	90.99	130.1	1.323	0.1812	0.2757	1229.0
560.0	0.1959	219.0	2.27	92.93	132.8	1.328	0.1811	0.2745	1241.0
570.0	0.1999	224.0	2.21	94.86	135.6	1.332	0.1810	0.2734	1252.0
580.0	0.2038	229.0	2.16	96.79	138.3	1.337	0.1809	0.2723	1263.0
590.0	0.2078	234.0	2.12	98.71	141.0	1.342	0.1809	0.2714	1274.0
600.0	0.2117	238.0	2.07	100.6	143.7	1.346	0.1808	0.2705	1285.0
700.0	0.2499	284.0	1.71	119.5	170.4	1.387	0.1807	0.2642	1386.0
800.0	0.2872	327.0	1.46	138.2	196.7	1.423	0.1814	0.2614	1478.0
900.0	0.3238	369.0	1.26	156.8	222.8	1.453	0.1828	0.2605	1561.0
1000.0	0.3601	410.0	1.14	175.5	248.8	1.481	0.1849	0.2610	1638.0
1500.0	0.5379	609.0	0.743	272.3	381.3	1.588	0.1995	0.2722	1963.0
2000.0	0.7134	804.0	0.553	375.8	521.1	1.668	0.2131	0.2847	2231.0
2500.0	0.8881	1000.0	0.441	485.1	666.0	1.733	0.2228	0.2941	2469.0
3000.0	1.062	1190.0	0.367	598.3	814.8	1.787	0.2296	0.3006	2685.0
3500.0	1.237	1380.0	0.314	714.4	966.3	1.834	0.2343	0.3052	2886.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

1100 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DV)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY * BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	53.96	211.0	15.3	99400.0	0.00221	0.0939	19.5	0.00373	1.46490	3.49
125.0	53.35	202.0	14.2	86400.0	0.00233	0.0911	16.8	0.00362	1.45904	3.13
130.0	52.72	193.0	13.4	75800.0	0.00245	0.0882	14.8	0.00354	1.45296	2.86
135.0	52.06	184.0	12.7	67000.0	0.00257	0.0854	13.3	0.00346	1.44666	2.66
140.0	51.38	176.0	12.2	59600.0	0.00269	0.0825	12.2	0.00339	1.44017	2.53
145.0	50.68	169.0	11.8	53200.0	0.00281	0.0797	11.3	0.00332	1.43349	2.42
150.0	49.95	162.0	11.3	47700.0	0.00293	0.0769	10.3	0.00325	1.42664	2.28
155.0	49.21	156.0	10.9	42800.0	0.00305	0.0741	9.57	0.00317	1.41963	2.21
160.0	48.45	150.0	10.5	38400.0	0.00317	0.0714	8.91	0.00309	1.41246	2.14
165.0	47.68	145.0	10.1	34500.0	0.00331	0.0688	8.29	0.00301	1.40513	2.08
170.0	46.88	140.0	9.68	30900.0	0.00346	0.0662	7.71	0.00292	1.39762	2.03
175.0	46.05	135.0	9.29	27600.0	0.00361	0.0636	7.17	0.00284	1.38994	1.98
180.0	45.21	130.0	8.91	24600.0	0.00379	0.0611	6.67	0.00275	1.38205	1.93
185.0	44.34	125.0	8.54	21900.0	0.00399	0.0586	6.20	0.00265	1.37396	1.90
190.0	43.44	120.0	8.18	19300.0	0.00421	0.0562	5.75	0.00256	1.36563	1.86
200.0	41.55	111.0	7.47	14800.0	0.00474	0.0514	4.93	0.00236	1.34816	1.81
205.0	40.54	106.0	7.12	12900.0	0.00506	0.0491	4.56	0.00226	1.33894	1.79
210.0	39.49	101.0	6.78	11100.0	0.00544	0.0468	4.20	0.00216	1.32935	1.77
215.0	38.39	95.6	6.44	9400.0	0.00590	0.0445	3.86	0.00206	1.31932	1.76
220.0	37.22	90.3	6.11	7880.0	0.00645	0.0423	3.54	0.00195	1.30877	1.75
225.0	35.98	85.0	5.77	6490.0	0.00714	0.0402	3.22	0.00184	1.29759	1.75
230.0	34.65	79.4	5.43	5240.0	0.00801	0.0383	2.92	0.00174	1.28564	1.75
235.0	33.20	73.8	5.08	4130.0	0.00912	0.0364	2.63	0.00163	1.27274	1.75
240.0	31.61	68.1	4.73	3170.0	0.0106	0.0347	2.35	0.00153	1.25868	1.75
245.0	29.86	62.7	4.38	2370.0	0.0123	0.0330	2.08	0.00143	1.24326	1.76
250.0	27.93	57.7	4.04	1770.0	0.0143	0.0311	1.84	0.00135	1.22647	1.76
255.0	25.88	53.8	3.74	1350.0	0.0161	0.0290	1.62	0.00129	1.20873	1.75
260.0	23.80	51.2	3.49	1100.0	0.0171	0.0268	1.45	0.00128	1.19100	1.71
265.0	21.84	49.7	3.31	950.0	0.0171	0.0246	1.32	0.00132	1.17438	1.65
270.0	20.08	49.2	3.19	870.0	0.0164	0.0227	1.23	0.00140	1.15957	1.58
275.0	18.55	49.3	3.10	831.0	0.0153	0.0211	1.17	0.00151	1.14681	1.50
280.0	17.24	49.9	3.04	817.0	0.0140	0.0198	1.12	0.00165	1.13599	1.43
285.0	16.13	50.9	2.99	817.0	0.0127	0.0187	1.09	0.00180	1.12686	1.36
290.0	15.18	52.0	2.96	826.0	0.0115	0.0179	1.07	0.00197	1.11912	1.29
295.0	14.37	53.4	2.93	840.0	0.0105	0.0172	1.06	0.00214	1.11252	1.24
300.0	13.67	54.8	2.90	855.0	0.00958	0.0167	1.05	0.00232	1.10682	1.19
310.0	12.51	57.9	2.86	886.0	0.00816	0.0160	1.04	0.00270	1.09749	1.11
320.0	11.60	61.2	2.82	915.0	0.00710	0.0155	1.03	0.00308	1.09013	1.04
330.0	10.85	64.5	2.79	941.0	0.00630	0.0153	1.04	0.00347	1.08414	0.992
340.0	10.22	67.8	2.76	963.0	0.00567	0.0151	1.04	0.00386	1.07913	0.952
350.0	9.681	71.1	2.73	983.0	0.00516	0.0151	1.05	0.00425	1.07486	0.921
360.0	9.213	74.4	2.71	1000.0	0.00475	0.0151	1.06	0.00463	1.07115	0.895
370.0	8.801	77.6	2.69	1010.0	0.00441	0.0151	1.07	0.00502	1.06789	0.875
380.0	8.435	80.9	2.67	1030.0	0.00412	0.0152	1.08	0.00540	1.06500	0.858
390.0	8.105	84.1	2.65	1040.0	0.00387	0.0152	1.10	0.00578	1.06240	0.843
400.0	7.806	87.3	2.63	1050.0	0.00365	0.0153	1.11	0.00617	1.06005	0.831
410.0	7.534	90.4	2.61	1060.0	0.00346	0.0154	1.12	0.00655	1.05791	0.821
420.0	7.284	93.6	2.60	1060.0	0.00329	0.0155	1.14	0.00694	1.05595	0.812
430.0	7.054	96.7	2.59	1070.0	0.00314	0.0157	1.15	0.00732	1.05415	0.804
440.0	6.840	100.0	2.57	1080.0	0.00300	0.0158	1.17	0.00771	1.05248	0.797
450.0	6.642	103.0	2.56	1080.0	0.00288	0.0159	1.18	0.00810	1.05094	0.791
460.0	6.457	106.0	2.55	1090.0	0.00277	0.0161	1.20	0.00850	1.04949	0.786
470.0	6.284	109.0	2.54	1090.0	0.00267	0.0162	1.21	0.00890	1.04814	0.781
480.0	6.122	112.0	2.52	1100.0	0.00257	0.0164	1.23	0.00930	1.04688	0.777
490.0	5.969	115.0	2.51	1100.0	0.00249	0.0165	1.24	0.00970	1.04569	0.773
500.0	5.825	118.0	2.50	1100.0	0.00241	0.0167	1.26	0.0101	1.04457	0.769
510.0	5.689	121.0	2.49	1110.0	0.00233	0.0169	1.27	0.0105	1.04351	0.766
520.0	5.559	124.0	2.49	1110.0	0.00226	0.0170	1.29	0.0109	1.04251	0.763
530.0	5.437	127.0	2.48	1110.0	0.00220	0.0172	1.30	0.0114	1.04156	0.760
540.0	5.320	130.0	2.47	1110.0	0.00214	0.0174	1.32	0.0118	1.04065	0.758
550.0	5.209	133.0	2.46	1120.0	0.00208	0.0175	1.33	0.0122	1.03979	0.756
560.0	5.103	135.0	2.45	1120.0	0.00203	0.0177	1.35	0.0126	1.03897	0.754
570.0	5.002	138.0	2.45	1120.0	0.00198	0.0179	1.36	0.0131	1.03819	0.752
580.0	4.906	141.0	2.44	1120.0	0.00193	0.0180	1.38	0.0135	1.03744	0.750
590.0	4.813	144.0	2.43	1120.0	0.00188	0.0182	1.39	0.0139	1.03672	0.748
600.0	4.724	147.0	2.43	1130.0	0.00184	0.0184	1.41	0.0144	1.03604	0.746
700.0	4.001	175.0	2.37	1130.0	0.00151	0.0201	1.55	0.0190	1.03046	0.734
800.0	3.482	203.0	2.32	1140.0	0.00129	0.0219	1.69	0.0241	1.02647	0.727
900.0	3.088	232.0	2.27	1140.0	0.00112	0.0237	1.82	0.0294	1.02345	0.723
1000.0	2.777	261.0	2.22	1140.0	0.00100	0.0255	1.95	0.0351	1.02107	0.719
1500.0	1.859	415.0	2.00	1130.0	0.000655					
2000.0	1.402	580.0	1.85	1130.0	0.000491					
2500.0	1.126	748.0	1.76	1120.0	0.000393					
3000.0	0.9412	916.0	1.70	1120.0	0.000328					
3500.0	0.8086	1080.0	1.66	1120.0	0.000282					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1200 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
120.0	0.01851	1860.0	220.0	-62.82	-53.71	0.5962	0.2685	0.4656	3867.0
125.0	0.01872	1640.0	201.0	-60.53	-56.37	0.6153	0.2688	0.4698	3642.0
130.0	0.01894	1460.0	186.0	-58.22	-54.01	0.6337	0.2659	0.4714	3457.0
135.0	0.01918	1300.0	173.0	-55.92	-51.65	0.6515	0.2616	0.4718	3301.0
140.0	0.01943	1160.0	161.0	-53.61	-49.30	0.6687	0.2569	0.4718	3164.0
145.0	0.01970	1070.0	150.0	-51.31	-46.94	0.6853	0.2523	0.4718	3040.0
150.0	0.01998	971.0	140.0	-49.02	-44.58	0.7013	0.2480	0.4721	2927.0
155.0	0.02027	886.0	131.0	-46.72	-42.21	0.7168	0.2443	0.4730	2820.0
160.0	0.02053	810.0	123.0	-44.42	-39.85	0.7318	0.2411	0.4746	2718.0
165.0	0.02092	740.0	115.0	-42.12	-37.47	0.7464	0.2383	0.4769	2620.0
170.0	0.02125	676.0	108.0	-39.80	-35.08	0.7607	0.2359	0.4799	2525.0
175.0	0.02164	617.0	101.0	-37.47	-32.67	0.7747	0.2339	0.4838	2432.0
180.0	0.02203	562.0	94.4	-35.13	-30.24	0.7884	0.2321	0.4885	2341.0
185.0	0.02245	511.0	88.3	-32.77	-27.78	0.8018	0.2306	0.4940	2252.0
190.0	0.02290	463.0	82.5	-30.38	-25.29	0.8151	0.2293	0.5005	2164.0
200.0	0.02391	376.0	71.7	-25.53	-20.21	0.8411	0.2270	0.5164	1990.0
205.0	0.02448	336.0	66.6	-23.05	-17.61	0.8540	0.2261	0.5262	1905.0
210.0	0.02510	299.0	61.8	-20.53	-14.95	0.8668	0.2252	0.5376	1820.0
215.0	0.02579	264.0	57.1	-17.96	-12.23	0.8796	0.2244	0.5509	1734.0
220.0	0.02654	232.0	52.6	-15.33	-9.445	0.8925	0.2238	0.5667	1648.0
225.0	0.02739	201.0	48.2	-12.64	-6.566	0.9054	0.2232	0.5855	1562.0
230.0	0.02835	172.0	44.0	-9.884	-3.583	0.9185	0.2228	0.6082	1475.0
235.0	0.02946	145.0	39.9	-7.022	-0.4761	0.9319	0.2225	0.6357	1386.0
240.0	0.03075	121.0	35.8	-4.050	2.782	0.9456	0.2224	0.6686	1298.0
245.0	0.03223	100.0	31.9	-0.9553	6.218	0.9598	0.2225	0.7064	1211.0
250.0	0.03411	82.0	28.2	2.270	9.850	0.9744	0.2228	0.7462	1128.0
255.0	0.03630	68.4	24.8	5.604	13.67	0.9896	0.2232	0.7808	1053.0
260.0	0.03888	59.2	21.7	8.993	17.63	1.005	0.2234	0.8005	991.4
265.0	0.04182	53.7	19.0	12.35	21.64	1.020	0.2231	0.7993	944.6
270.0	0.04503	51.2	16.8	15.59	25.59	1.035	0.2221	0.7791	912.4
275.0	0.04843	50.7	14.9	18.65	29.41	1.049	0.2204	0.7458	892.0
280.0	0.05191	51.7	13.4	21.51	33.04	1.062	0.2182	0.7057	880.4
285.0	0.05540	53.7	12.2	24.15	36.46	1.074	0.2157	0.6635	875.1
290.0	0.05885	56.5	11.1	26.60	39.68	1.085	0.2131	0.6226	874.2
295.0	0.06223	59.7	10.3	28.87	42.70	1.096	0.2106	0.5849	876.5
300.0	0.06552	63.2	9.54	30.97	45.53	1.105	0.2081	0.5512	880.9
310.0	0.07180	70.8	8.36	34.80	50.76	1.122	0.2038	0.4960	893.6
320.0	0.07771	78.6	7.47	38.23	55.50	1.137	0.2002	0.4544	909.1
330.0	0.08330	86.3	6.77	41.37	59.88	1.151	0.1972	0.4228	925.7
340.0	0.08863	93.8	6.21	44.29	63.98	1.163	0.1948	0.3985	942.7
350.0	0.09373	101.0	5.75	47.04	67.87	1.174	0.1928	0.3794	959.7
360.0	0.09864	108.0	5.37	49.66	71.58	1.185	0.1912	0.3640	976.4
370.0	0.1034	115.0	5.04	52.18	75.16	1.195	0.1898	0.3515	992.9
380.0	0.1080	121.0	4.75	54.61	78.62	1.204	0.1886	0.3412	1009.0
390.0	0.1125	128.0	4.50	56.98	81.99	1.213	0.1876	0.3324	1025.0
400.0	0.1169	134.0	4.28	59.29	85.27	1.221	0.1868	0.3250	1040.0
410.0	0.1213	140.0	4.08	61.54	88.49	1.229	0.1861	0.3187	1055.0
420.0	0.1255	146.0	3.91	63.76	91.65	1.237	0.1854	0.3132	1070.0
430.0	0.1297	152.0	3.75	65.94	94.76	1.244	0.1849	0.3084	1084.0
440.0	0.1338	156.0	3.60	68.09	97.82	1.251	0.1844	0.3041	1098.0
450.0	0.1378	163.0	3.47	70.21	100.8	1.258	0.1840	0.3004	1112.0
460.0	0.1418	169.0	3.34	72.31	103.8	1.264	0.1836	0.2970	1126.0
470.0	0.1458	174.0	3.23	74.38	106.8	1.271	0.1832	0.2940	1139.0
480.0	0.1497	180.0	3.13	76.44	109.7	1.277	0.1829	0.2913	1152.0
490.0	0.1536	185.0	3.03	78.48	112.6	1.283	0.1827	0.2889	1165.0
500.0	0.1574	190.0	2.94	80.50	115.5	1.289	0.1824	0.2866	1177.0
510.0	0.1613	196.0	2.85	82.51	118.3	1.294	0.1822	0.2846	1189.0
520.0	0.1650	201.0	2.78	84.50	121.2	1.300	0.1820	0.2827	1202.0
530.0	0.1688	206.0	2.70	86.49	124.0	1.305	0.1818	0.2810	1214.0
540.0	0.1725	211.0	2.63	88.46	126.8	1.310	0.1817	0.2795	1225.0
550.0	0.1762	216.0	2.56	90.43	129.6	1.315	0.1816	0.2780	1237.0
560.0	0.1799	221.0	2.50	92.38	132.4	1.320	0.1814	0.2767	1248.0
570.0	0.1836	225.0	2.44	94.33	135.1	1.325	0.1813	0.2755	1260.0
580.0	0.1872	230.0	2.39	96.27	137.9	1.330	0.1812	0.2743	1271.0
590.0	0.1908	235.0	2.33	98.20	140.6	1.335	0.1811	0.2733	1282.0
600.0	0.1944	240.0	2.28	100.1	143.3	1.339	0.1811	0.2723	1292.0
700.0	0.2298	266.0	1.88	119.1	170.2	1.381	0.1809	0.2655	1394.0
800.0	0.2641	329.0	1.60	137.9	196.5	1.416	0.1815	0.2623	1485.0
900.0	0.2978	372.0	1.40	156.5	222.7	1.447	0.1830	0.2612	1568.0
1000.0	0.3311	413.0	1.25	175.3	248.8	1.474	0.1850	0.2616	1645.0
1500.0	0.4943	613.0	0.811	272.1	382.0	1.582	0.1995	0.2724	1969.0
2000.0	0.6553	807.0	0.603	375.8	521.4	1.662	0.2131	0.2848	2236.0
2500.0	0.8155	1000.0	0.481	485.0	666.3	1.727	0.2229	0.2941	2473.0
3000.0	0.9754	1190.0	0.400	598.3	815.1	1.781	0.2296	0.3007	2690.0
3500.0	1.135	1380.0	0.343	714.4	966.6	1.828	0.2343	0.3052	2890.0

* TWO-PHASE BOUNDARY

1200 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)/V$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	1/DEG. R	BTU/FT-HR-R	LB/FT-SEC * 10^5	SQ FT/HR		
120.0	54.02	213.0	15.1	101000.0	0.00218	0.0942	19.8	0.00374	1.46542	3.53
125.0	53.41	204.0	14.0	87500.0	0.00230	0.0914	17.1	0.00364	1.45963	3.16
130.0	52.79	195.0	13.3	76800.0	0.00242	0.0885	15.0	0.00356	1.45362	2.87
135.0	52.14	186.0	12.7	68000.0	0.00254	0.0857	13.5	0.00348	1.44740	2.67
140.0	51.46	178.0	12.2	60500.0	0.00265	0.0829	12.4	0.00341	1.44099	2.53
145.0	50.77	170.0	11.7	54200.0	0.00277	0.0801	11.4	0.00334	1.43439	2.42
150.0	50.06	164.0	11.3	48600.0	0.00288	0.0773	10.4	0.00327	1.42763	2.30
155.0	49.33	158.0	10.9	43700.0	0.00300	0.0746	9.67	0.00320	1.42071	2.21
160.0	48.58	152.0	10.5	39300.0	0.00312	0.0719	9.01	0.00312	1.41364	2.14
165.0	47.81	147.0	10.1	35400.0	0.00325	0.0693	8.40	0.00304	1.40641	2.08
170.0	47.03	142.0	9.70	31800.0	0.00339	0.0667	7.82	0.00295	1.39903	2.03
175.0	46.22	137.0	9.33	28500.0	0.00354	0.0641	7.28	0.00287	1.39147	1.98
180.0	45.39	132.0	8.96	25500.0	0.00370	0.0616	6.78	0.00278	1.38374	1.93
185.0	44.54	127.0	8.59	22700.0	0.00388	0.0592	6.30	0.00269	1.37581	1.89
190.0	43.66	123.0	8.24	20200.0	0.00408	0.0568	5.86	0.00260	1.36767	1.86
200.0	41.82	113.0	7.55	15700.0	0.00456	0.0521	5.05	0.00241	1.35066	1.80
205.0	40.85	109.0	7.22	13700.0	0.00485	0.0498	4.67	0.00232	1.34175	1.78
210.0	39.84	104.0	6.89	11900.0	0.00518	0.0476	4.32	0.00222	1.33250	1.76
215.0	38.78	98.9	6.56	10300.0	0.00557	0.0454	3.98	0.00212	1.32289	1.74
220.0	37.68	94.0	6.24	8720.0	0.00603	0.0432	3.66	0.00202	1.31285	1.73
225.0	36.51	89.0	5.92	7330.0	0.00658	0.0411	3.36	0.00192	1.30231	1.72
230.0	35.27	83.8	5.60	6060.0	0.00726	0.0392	3.06	0.00183	1.29118	1.71
235.0	33.94	78.6	5.28	4930.0	0.00809	0.0374	2.78	0.00173	1.27935	1.70
240.0	32.52	73.4	4.95	3930.0	0.00911	0.0357	2.51	0.00164	1.26669	1.69
245.0	30.98	68.3	4.63	3090.0	0.0103	0.0341	2.26	0.00156	1.25309	1.68
250.0	29.31	63.6	4.32	2400.0	0.0117	0.0324	2.02	0.00148	1.23852	1.67
255.0	27.55	59.4	4.03	1890.0	0.0131	0.0306	1.80	0.00142	1.22314	1.66
260.0	25.72	56.2	3.77	1520.0	0.0142	0.0286	1.62	0.00139	1.20739	1.63
265.0	23.91	54.1	3.56	1290.0	0.0148	0.0266	1.47	0.00139	1.19195	1.59
270.0	22.21	52.8	3.40	1140.0	0.0147	0.0246	1.36	0.00142	1.17747	1.54
275.0	20.65	52.3	3.28	1050.0	0.0143	0.0229	1.27	0.00149	1.16437	1.49
280.0	19.26	52.3	3.20	1000.0	0.0135	0.0215	1.21	0.00158	1.15280	1.43
285.0	18.05	52.8	3.13	970.0	0.0126	0.0203	1.17	0.00169	1.14270	1.38
290.0	16.99	53.6	3.08	953.0	0.0116	0.0193	1.14	0.00182	1.13396	1.32
295.0	16.07	54.6	3.04	959.0	0.0107	0.0185	1.11	0.00197	1.12638	1.27
300.0	15.26	55.8	3.00	965.0	0.00988	0.0178	1.10	0.00212	1.11979	1.22
310.0	13.93	58.5	2.95	986.0	0.00848	0.0169	1.08	0.00245	1.10892	1.14
320.0	12.87	61.5	2.90	1010.0	0.00733	0.0164	1.07	0.00280	1.10035	1.07
330.0	12.00	64.6	2.86	1040.0	0.00654	0.0160	1.07	0.00315	1.09340	1.01
340.0	11.28	67.8	2.83	1060.0	0.00587	0.0158	1.07	0.00351	1.08762	0.972
350.0	10.67	71.1	2.80	1080.0	0.00534	0.0157	1.08	0.00387	1.08272	0.937
360.0	10.14	74.3	2.77	1100.0	0.00490	0.0156	1.08	0.00423	1.07848	0.909
370.0	9.671	77.5	2.74	1110.0	0.00453	0.0156	1.09	0.00459	1.07478	0.887
380.0	9.257	80.8	2.72	1120.0	0.00422	0.0156	1.10	0.00495	1.07150	0.868
390.0	8.886	84.0	2.70	1140.0	0.00396	0.0157	1.12	0.00530	1.06856	0.852
400.0	8.551	87.1	2.68	1150.0	0.00373	0.0157	1.13	0.00566	1.06592	0.839
410.0	8.247	90.3	2.66	1160.0	0.00353	0.0158	1.14	0.00602	1.06352	0.827
420.0	7.968	93.5	2.64	1170.0	0.00335	0.0159	1.15	0.00638	1.06133	0.818
430.0	7.712	96.6	2.63	1170.0	0.00319	0.0160	1.17	0.00674	1.05931	0.809
440.0	7.475	100.0	2.61	1180.0	0.00305	0.0161	1.18	0.00710	1.05745	0.802
450.0	7.255	103.0	2.60	1190.0	0.00292	0.0163	1.20	0.00746	1.05573	0.795
460.0	7.050	106.0	2.58	1190.0	0.00281	0.0164	1.21	0.00783	1.05412	0.790
470.0	6.859	109.0	2.57	1200.0	0.00270	0.0165	1.23	0.00820	1.05263	0.784
480.0	6.679	112.0	2.56	1200.0	0.00260	0.0167	1.24	0.00857	1.05122	0.780
490.0	6.510	115.0	2.55	1210.0	0.00251	0.0168	1.25	0.00894	1.04991	0.776
500.0	6.351	118.0	2.54	1210.0	0.00243	0.0170	1.27	0.00932	1.04867	0.772
510.0	6.201	121.0	2.53	1210.0	0.00235	0.0171	1.28	0.00970	1.04750	0.769
520.0	6.059	124.0	2.52	1220.0	0.00228	0.0173	1.30	0.0101	1.04639	0.765
530.0	5.924	127.0	2.51	1220.0	0.00222	0.0174	1.31	0.0105	1.04534	0.763
540.0	5.796	130.0	2.50	1220.0	0.00215	0.0176	1.33	0.0109	1.04435	0.760
550.0	5.674	133.0	2.49	1220.0	0.00210	0.0178	1.34	0.0113	1.04340	0.757
560.0	5.558	136.0	2.48	1230.0	0.00204	0.0179	1.36	0.0117	1.04250	0.755
570.0	5.447	138.0	2.47	1230.0	0.00199	0.0181	1.37	0.0121	1.04164	0.753
580.0	5.341	141.0	2.47	1230.0	0.00194	0.0183	1.39	0.0125	1.04082	0.751
590.0	5.240	144.0	2.46	1230.0	0.00189	0.0184	1.40	0.0129	1.04003	0.749
600.0	5.143	147.0	2.45	1230.0	0.00185	0.0186	1.42	0.0133	1.03928	0.748
700.0	4.352	176.0	2.39	1240.0	0.00151	0.0203	1.56	0.0176	1.03317	0.735
800.0	3.787	204.0	2.33	1250.0	0.00129	0.0220	1.70	0.0222	1.02881	0.728
900.0	3.358	232.0	2.28	1250.0	0.00112	0.0238	1.83	0.0271	1.02552	0.723
1000.0	3.020	261.0	2.23	1250.0	0.00100	0.0256	1.95	0.0324	1.02293	0.720
1500.0	2.023	416.0	2.01	1240.0	0.000654					
2000.0	1.526	582.0	1.86	1230.0	0.000490					
2500.0	1.226	750.0	1.76	1230.0	0.000392					
3000.0	1.023	918.0	1.70	1220.0	0.000328					
3500.0	0.8810	1090.0	1.66	1220.0	0.000281					

* TWO-PHASE BOUNDARY

1300 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01849	1880.0	219.0	-62.91	-58.45	0.5954	0.2705	0.4645	3867.0
125.0	0.01870	1660.0	201.0	-60.62	-56.12	0.6145	0.2707	0.4666	3644.0
130.0	0.01892	1470.0	186.0	-58.33	-53.77	0.6329	0.2676	0.4701	3462.0
135.0	0.01915	1320.0	173.0	-56.03	-51.42	0.6506	0.2632	0.4704	3308.0
140.0	0.01940	1190.0	161.0	-53.74	-49.07	0.6678	0.2583	0.4703	3173.0
145.0	0.01966	1080.0	150.0	-51.45	-46.72	0.6843	0.2536	0.4702	3052.0
150.0	0.01994	988.0	141.0	-49.17	-44.37	0.7002	0.2492	0.4704	2940.0
155.0	0.02023	903.0	132.0	-46.88	-42.01	0.7156	0.2454	0.4712	2835.0
160.0	0.02053	827.0	124.0	-44.60	-39.65	0.7306	0.2420	0.4725	2735.0
165.0	0.02085	757.0	116.0	-42.31	-37.29	0.7452	0.2392	0.4746	2639.0
170.0	0.02120	694.0	109.0	-40.01	-34.91	0.7594	0.2367	0.4773	2545.0
175.0	0.02155	635.0	102.0	-37.70	-32.51	0.7733	0.2346	0.4808	2455.0
180.0	0.02195	580.0	95.4	-35.38	-30.10	0.7869	0.2328	0.4851	2366.0
185.0	0.02236	529.0	89.4	-33.04	-27.66	0.8002	0.2312	0.4901	2278.0
190.0	0.02279	481.0	83.7	-30.66	-25.20	0.8134	0.2298	0.4959	2192.0
200.0	0.02375	394.0	73.0	-25.89	-20.17	0.8392	0.2274	0.5101	2024.0
205.0	0.02431	355.0	68.0	-23.45	-17.60	0.8519	0.2264	0.5188	1941.0
210.0	0.02490	318.0	63.2	-20.97	-14.98	0.8645	0.2254	0.5286	1859.0
215.0	0.02554	283.0	58.7	-18.46	-12.31	0.8770	0.2246	0.5400	1777.0
220.0	0.02625	251.0	54.2	-15.90	-9.589	0.8896	0.2238	0.5531	1695.0
225.0	0.02704	220.0	50.0	-13.28	-6.782	0.9022	0.2231	0.5685	1612.0
230.0	0.02792	192.0	45.8	-10.61	-3.895	0.9149	0.2225	0.5865	1530.0
235.0	0.02891	165.0	41.9	-7.871	-0.9121	0.9277	0.2221	0.6077	1447.0
240.0	0.03005	141.0	38.0	-5.045	2.187	0.9408	0.2217	0.6324	1365.0
245.0	0.03135	119.0	34.3	-2.130	5.417	0.9541	0.2215	0.6602	1284.0
250.0	0.03288	101.0	30.7	0.8761	8.792	0.9677	0.2215	0.6897	1206.0
255.0	0.03465	85.6	27.4	3.967	12.31	0.9817	0.2215	0.7174	1133.0
260.0	0.03673	74.1	24.3	7.112	15.95	0.996	0.2214	0.7379	1070.0
265.0	0.03908	66.2	21.5	10.26	19.67	1.010	0.2212	0.7462	1017.0
270.0	0.04168	61.4	19.2	13.36	23.39	1.024	0.2205	0.7405	977.2
275.0	0.04443	59.0	17.2	16.35	27.05	1.037	0.2194	0.7225	948.5
280.0	0.04741	58.3	15.5	19.19	30.60	1.050	0.2178	0.6962	929.2
285.0	0.05043	58.9	14.0	21.87	34.01	1.062	0.2159	0.6651	917.1
290.0	0.05346	60.5	12.8	24.38	37.25	1.073	0.2137	0.6321	910.6
295.0	0.05643	62.8	11.8	26.73	40.33	1.084	0.2115	0.5995	908.2
300.0	0.05945	65.6	11.0	28.94	43.25	1.094	0.2093	0.5687	908.7
310.0	0.06524	72.1	9.56	32.95	48.66	1.112	0.2051	0.5148	915.8
320.0	0.07074	79.3	8.50	36.55	53.53	1.127	0.2015	0.4718	927.4
330.0	0.07599	86.6	7.67	39.84	58.13	1.141	0.1985	0.4383	941.5
340.0	0.08093	94.0	7.01	42.88	62.37	1.154	0.1959	0.4120	956.7
350.0	0.08577	101.0	6.47	45.73	66.38	1.165	0.1939	0.3911	972.4
360.0	0.09033	108.0	6.01	48.45	70.21	1.176	0.1921	0.3743	988.2
370.0	0.09487	115.0	5.63	51.04	73.88	1.186	0.1906	0.3605	1004.0
380.0	0.09921	122.0	5.30	53.54	77.42	1.196	0.1894	0.3491	1019.0
390.0	0.1034	128.0	5.01	55.97	80.87	1.205	0.1883	0.3396	1035.0
400.0	0.1076	135.0	4.75	58.32	84.22	1.213	0.1874	0.3315	1050.0
410.0	0.1116	141.0	4.53	60.63	87.50	1.221	0.1867	0.3245	1065.0
420.0	0.1156	147.0	4.33	62.89	90.71	1.229	0.1860	0.3185	1079.0
430.0	0.1195	153.0	4.14	65.10	93.87	1.236	0.1854	0.3132	1093.0
440.0	0.1233	158.0	3.98	67.29	96.98	1.244	0.1849	0.3086	1107.0
450.0	0.1271	164.0	3.83	69.44	100.0	1.250	0.1844	0.3045	1121.0
460.0	0.1309	170.0	3.69	71.56	103.1	1.257	0.1840	0.3009	1134.0
470.0	0.1346	175.0	3.56	73.67	106.1	1.264	0.1837	0.2976	1147.0
480.0	0.1382	181.0	3.44	75.75	109.0	1.270	0.1833	0.2946	1160.0
490.0	0.1419	186.0	3.33	77.81	112.0	1.276	0.1831	0.2920	1173.0
500.0	0.1454	191.0	3.23	79.85	114.9	1.282	0.1828	0.2896	1185.0
510.0	0.1490	197.0	3.14	81.88	117.7	1.287	0.1826	0.2874	1198.0
520.0	0.1525	202.0	3.05	83.89	120.6	1.293	0.1824	0.2854	1210.0
530.0	0.1560	207.0	2.96	85.90	123.5	1.298	0.1822	0.2835	1221.0
540.0	0.1595	212.0	2.88	87.89	126.3	1.304	0.1820	0.2818	1233.0
550.0	0.1630	217.0	2.81	89.87	129.1	1.309	0.1818	0.2803	1245.0
560.0	0.1664	222.0	2.74	91.84	131.9	1.314	0.1817	0.2788	1256.0
570.0	0.1698	227.0	2.67	93.80	134.7	1.319	0.1816	0.2775	1267.0
580.0	0.1732	232.0	2.61	95.75	137.4	1.324	0.1815	0.2763	1278.0
590.0	0.1765	237.0	2.55	97.70	140.2	1.328	0.1814	0.2751	1289.0
600.0	0.1799	241.0	2.49	99.6	142.9	1.333	0.1813	0.2741	1300.0
700.0	0.2127	288.0	2.05	118.7	169.9	1.375	0.1811	0.2667	1401.0
800.0	0.2445	332.0	1.75	137.5	196.4	1.410	0.1817	0.2632	1492.0
900.0	0.2758	374.0	1.53	156.3	222.6	1.441	0.1831	0.2619	1575.0
1000.0	0.3066	416.0	1.36	175.0	248.8	1.468	0.1851	0.2621	1651.0
1500.0	0.4575	616.0	0.879	272.0	382.2	1.576	0.1936	0.2726	1974.0
2000.0	0.6062	811.0	0.654	375.7	521.6	1.657	0.2131	0.2849	2241.0
2500.0	0.7542	1000.0	0.521	485.0	666.6	1.721	0.2229	0.2942	2478.0
3000.0	0.9017	1200.0	0.434	598.3	815.4	1.775	0.2296	0.3007	2694.0
3500.0	1.049	1390.0	0.371	714.4	969.9	1.822	0.2343	0.3053	2894.0

* TWO-PHASE BOUNDARY

1300 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	54.07	216.0	15.0	102000.0	0.00215	0.0945	20.1	0.00376	1.46593	3.56
125.0	53.47	206.0	13.9	88500.0	0.00227	0.0917	17.3	0.00366	1.46021	3.18
130.0	52.85	197.0	13.2	77900.0	0.00239	0.0889	15.2	0.00358	1.45428	2.89
135.0	52.21	188.0	12.6	69000.0	0.00251	0.0861	13.6	0.00350	1.44813	2.68
140.0	51.55	180.0	12.1	61500.0	0.00262	0.0833	12.5	0.00343	1.44179	2.54
145.0	50.86	172.0	11.7	55100.0	0.00273	0.0805	11.5	0.00336	1.43527	2.43
150.0	50.16	166.0	11.3	49600.0	0.00284	0.0777	10.6	0.00329	1.42860	2.31
155.0	49.44	160.0	10.9	44700.0	0.00295	0.0750	9.78	0.00322	1.42177	2.21
160.0	48.70	154.0	10.5	40300.0	0.00307	0.0724	9.12	0.00314	1.41479	2.14
165.0	47.95	149.0	10.1	36300.0	0.00319	0.0697	8.50	0.00307	1.40767	2.08
170.0	47.17	144.0	9.73	32700.0	0.00332	0.0672	7.92	0.00298	1.40040	2.03
175.0	46.38	139.0	9.36	29400.0	0.00345	0.0647	7.39	0.00290	1.39297	1.98
180.0	45.57	134.0	9.00	26400.0	0.00361	0.0622	6.88	0.00281	1.38537	1.93
185.0	44.73	130.0	8.64	23600.0	0.00378	0.0598	6.41	0.00273	1.37760	1.89
190.0	43.87	125.0	8.30	21100.0	0.00397	0.0574	5.97	0.00264	1.36963	1.86
200.0	42.08	116.0	7.63	16600.0	0.00440	0.0528	5.15	0.00246	1.35306	1.79
205.0	41.14	111.0	7.30	14600.0	0.00466	0.0505	4.78	0.00237	1.34440	1.77
210.0	40.16	107.0	6.98	12800.0	0.00495	0.0483	4.43	0.00228	1.33546	1.75
215.0	39.15	102.0	6.67	11100.0	0.00529	0.0462	4.10	0.00218	1.32621	1.73
220.0	38.09	97.4	6.36	9550.0	0.00568	0.0441	3.78	0.00209	1.31661	1.71
225.0	36.98	92.7	6.06	8150.0	0.00613	0.0420	3.48	0.00200	1.30660	1.70
230.0	35.82	87.8	5.75	6870.0	0.00668	0.0401	3.19	0.00191	1.29612	1.68
235.0	34.59	83.0	5.45	5720.0	0.00732	0.0383	2.92	0.00182	1.28510	1.67
240.0	33.28	78.1	5.15	4690.0	0.00809	0.0366	2.66	0.00174	1.27347	1.65
245.0	31.89	73.4	4.85	3810.0	0.00900	0.0350	2.41	0.00166	1.26115	1.64
250.0	30.41	68.8	4.56	3070.0	0.0100	0.0335	2.18	0.00160	1.24813	1.62
255.0	28.85	64.8	4.28	2470.0	0.0111	0.0318	1.97	0.00154	1.23447	1.60
260.0	27.23	61.3	4.03	2020.0	0.0120	0.0300	1.78	0.00150	1.22040	1.57
265.0	25.59	58.7	3.81	1690.0	0.0127	0.0282	1.62	0.00148	1.20629	1.54
270.0	23.99	56.9	3.62	1470.0	0.0130	0.0264	1.49	0.00148	1.19263	1.51
275.0	22.48	55.8	3.48	1330.0	0.0129	0.0246	1.39	0.00152	1.17980	1.47
280.0	21.09	55.3	3.37	1230.0	0.0126	0.0231	1.31	0.00157	1.16807	1.42
285.0	19.83	55.3	3.28	1170.0	0.0120	0.0218	1.25	0.00165	1.15752	1.37
290.0	18.71	55.7	3.21	1130.0	0.0113	0.0207	1.21	0.00175	1.14814	1.33
295.0	17.71	56.4	3.16	1110.0	0.0106	0.0198	1.18	0.00186	1.13996	1.28
300.0	16.82	57.3	3.11	1100.0	0.00993	0.0190	1.15	0.00199	1.13254	1.24
310.0	15.33	59.5	3.04	1110.0	0.00865	0.0179	1.12	0.00227	1.12033	1.16
320.0	14.14	62.2	2.98	1120.0	0.00759	0.0172	1.11	0.00258	1.11062	1.09
330.0	13.16	65.1	2.94	1140.0	0.00673	0.0168	1.10	0.00290	1.10273	1.03
340.0	12.35	68.2	2.90	1160.0	0.00604	0.0165	1.10	0.00324	1.09618	0.989
350.0	11.66	71.3	2.86	1180.0	0.00548	0.0163	1.10	0.00357	1.09063	0.952
360.0	11.06	74.5	2.83	1200.0	0.00503	0.0162	1.11	0.00390	1.08586	0.922
370.0	10.54	77.7	2.80	1210.0	0.00464	0.0161	1.11	0.00424	1.08170	0.897
380.0	10.08	80.8	2.78	1230.0	0.00432	0.0161	1.12	0.00457	1.07802	0.877
390.0	9.667	84.0	2.75	1240.0	0.00404	0.0161	1.13	0.00491	1.07475	0.860
400.0	9.296	87.2	2.73	1250.0	0.00380	0.0161	1.14	0.00524	1.07180	0.846
410.0	8.959	90.3	2.71	1260.0	0.00359	0.0162	1.16	0.00558	1.06914	0.834
420.0	6.651	93.5	2.69	1270.0	0.00341	0.0163	1.17	0.00591	1.06670	0.823
430.0	8.368	96.6	2.67	1280.0	0.00324	0.0164	1.18	0.00625	1.06447	0.814
440.0	8.107	100.0	2.65	1280.0	0.00310	0.0165	1.20	0.00659	1.06242	0.806
450.0	7.865	103.0	2.64	1290.0	0.00296	0.0166	1.21	0.00693	1.06052	0.799
460.0	7.640	106.0	2.62	1300.0	0.00284	0.0167	1.22	0.00727	1.05875	0.793
470.0	7.430	109.0	2.61	1300.0	0.00273	0.0168	1.24	0.00761	1.05710	0.788
480.0	7.234	112.0	2.59	1310.0	0.00263	0.0170	1.25	0.00796	1.05556	0.783
490.0	7.049	115.0	2.58	1310.0	0.00254	0.0171	1.27	0.00831	1.05412	0.778
500.0	6.875	118.0	2.57	1320.0	0.00245	0.0172	1.28	0.00866	1.05276	0.774
510.0	6.711	121.0	2.56	1320.0	0.00238	0.0174	1.30	0.00901	1.05148	0.771
520.0	6.556	124.0	2.55	1320.0	0.00230	0.0175	1.31	0.00937	1.05026	0.767
530.0	6.409	127.0	2.54	1330.0	0.00223	0.0177	1.32	0.00973	1.04912	0.764
540.0	6.270	130.0	2.53	1330.0	0.00217	0.0178	1.34	0.0101	1.04803	0.762
550.0	6.137	133.0	2.52	1330.0	0.00211	0.0180	1.35	0.0105	1.04700	0.759
560.0	6.010	136.0	2.51	1330.0	0.00205	0.0181	1.37	0.0108	1.04601	0.757
570.0	5.890	139.0	2.50	1340.0	0.00200	0.0183	1.38	0.0112	1.04507	0.755
580.0	5.774	142.0	2.49	1340.0	0.00195	0.0185	1.40	0.0116	1.04418	0.752
590.0	5.664	144.0	2.48	1340.0	0.00190	0.0186	1.41	0.0120	1.04332	0.751
600.0	5.559	147.0	2.48	1340.0	0.00186	0.0188	1.43	0.0123	1.04250	0.749
700.0	4.701	176.0	2.41	1350.0	0.00152	0.0205	1.57	0.0163	1.03586	0.736
800.0	4.089	204.0	2.35	1360.0	0.00129	0.0222	1.70	0.0206	1.03114	0.728
900.0	3.626	233.0	2.30	1360.0	0.00112	0.0239	1.83	0.0252	1.02758	0.723
1000.0	3.262	262.0	2.25	1360.0	0.00100	0.0257	1.96	0.0300	1.02478	0.720
1500.0	2.186	417.0	2.02	1350.0	0.000653					
2000.0	1.650	583.0	1.86	1340.0	0.000489					
2500.0	1.326	751.0	1.76	1330.0	0.000392					
3000.0	1.109	919.0	1.70	1330.0	0.000327					
3500.0	0.9532	1090.0	1.66	1320.0	0.000281					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1400 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01848	1900.0	219.0	-62.99	-58.20	0.5947	0.2725	0.4633	3867.0
125.0	0.01868	1670.0	201.0	-60.71	-55.87	0.6137	0.2725	0.4673	3647.0
130.0	0.01890	1490.0	186.0	-58.43	-53.53	0.6321	0.2633	0.4688	3467.0
135.0	0.01913	1340.0	173.0	-56.14	-51.19	0.6498	0.2647	0.4690	3315.0
140.0	0.01937	1210.0	161.0	-53.86	-48.84	0.6668	0.2597	0.4688	3182.0
145.0	0.01963	1100.0	151.0	-51.58	-46.50	0.6833	0.2548	0.4687	3063.0
150.0	0.01990	1000.0	141.0	-49.31	-44.15	0.6992	0.2504	0.4688	2953.0
155.0	0.02018	920.0	132.0	-47.04	-41.81	0.7145	0.2464	0.4694	2850.0
160.0	0.02048	844.0	124.0	-44.77	-39.46	0.7295	0.2430	0.4706	2752.0
165.0	0.02080	774.0	117.0	-42.49	-37.10	0.7440	0.2400	0.4724	2657.0
170.0	0.02114	711.0	110.0	-40.21	-34.73	0.7581	0.2375	0.4749	2566.0
175.0	0.02149	652.0	103.0	-37.92	-32.35	0.7719	0.2353	0.4780	2477.0
180.0	0.02186	597.0	96.5	-35.62	-29.95	0.7854	0.2334	0.4819	2390.0
185.0	0.02225	546.0	90.5	-33.30	-27.53	0.7987	0.2318	0.4864	2304.0
190.0	0.02269	498.0	84.8	-30.97	-25.09	0.8117	0.2303	0.4917	2220.0
200.0	0.02362	412.0	74.3	-26.23	-20.11	0.8373	0.2278	0.5044	2056.0
205.0	0.02415	373.0	69.3	-23.83	-17.57	0.8498	0.2267	0.5121	1976.0
210.0	0.02471	336.0	64.6	-21.39	-14.99	0.8623	0.2257	0.5207	1896.0
215.0	0.02532	302.0	60.1	-18.92	-12.36	0.8746	0.2248	0.5305	1817.0
220.0	0.02593	270.0	55.8	-16.42	-9.689	0.8869	0.2239	0.5416	1738.0
225.0	0.02672	239.0	51.6	-13.87	-6.950	0.8992	0.2231	0.5544	1659.0
230.0	0.02754	211.0	47.6	-11.27	-4.142	0.9116	0.2224	0.5690	1581.0
235.0	0.02844	185.0	43.7	-8.629	-1.256	0.9240	0.2218	0.5859	1503.0
240.0	0.02946	160.0	40.0	-5.916	1.720	0.9365	0.2213	0.6050	1426.0
245.0	0.03061	139.0	36.4	-3.138	4.797	0.9492	0.2208	0.6263	1349.0
250.0	0.03193	119.0	32.9	-0.2917	7.985	0.9621	0.2205	0.6488	1276.0
255.0	0.03343	103.0	29.7	2.618	11.28	0.9752	0.2202	0.6707	1206.0
260.0	0.03515	90.0	26.6	5.574	14.69	0.9884	0.2200	0.6889	1143.0
265.0	0.03709	80.1	23.9	8.547	18.16	1.002	0.2197	0.7000	1088.0
270.0	0.03924	73.3	21.4	11.50	21.67	1.015	0.2191	0.7017	1043.0
275.0	0.04153	69.0	19.3	14.38	25.16	1.028	0.2183	0.6936	1008.0
280.0	0.04405	66.7	17.5	17.17	28.59	1.040	0.2171	0.6775	982.2
285.0	0.04665	66.0	15.9	19.83	31.93	1.052	0.2156	0.6557	964.1
290.0	0.04929	66.3	14.6	22.36	35.14	1.063	0.2138	0.6306	952.1
295.0	0.05197	67.6	13.4	24.76	38.23	1.073	0.2119	0.6041	944.9
300.0	0.05464	69.5	12.4	27.02	41.18	1.083	0.2099	0.5775	941.3
310.0	0.05991	74.8	10.8	31.18	46.71	1.102	0.2061	0.5279	942.0
320.0	0.06500	81.1	9.58	34.92	51.77	1.118	0.2026	0.4859	949.2
330.0	0.06989	87.9	8.62	38.33	56.45	1.132	0.1995	0.4516	960.1
340.0	0.07458	94.9	7.85	41.49	60.82	1.145	0.1970	0.4241	973.1
350.0	0.07903	102.0	7.22	44.45	64.95	1.157	0.1948	0.4019	987.1
360.0	0.08344	109.0	6.69	47.24	68.87	1.168	0.1930	0.3839	1002.0
370.0	0.08765	116.0	6.25	49.91	72.64	1.178	0.1914	0.3691	1016.0
380.0	0.09175	122.0	5.87	52.48	76.26	1.188	0.1901	0.3568	1031.0
390.0	0.09573	129.0	5.54	54.96	79.78	1.197	0.1890	0.3464	1046.0
400.0	0.0996	135.0	5.24	57.37	83.20	1.206	0.1881	0.3377	1060.0
410.0	0.1034	141.0	4.99	59.72	86.54	1.214	0.1872	0.3301	1075.0
420.0	0.1072	148.0	4.76	62.02	89.80	1.222	0.1865	0.3236	1089.0
430.0	0.1108	153.0	4.55	64.27	93.01	1.230	0.1859	0.3179	1103.0
440.0	0.1145	159.0	4.36	66.49	96.16	1.237	0.1853	0.3129	1117.0
450.0	0.1180	165.0	4.19	68.67	99.27	1.244	0.1849	0.3085	1130.0
460.0	0.1215	171.0	4.04	70.83	102.3	1.250	0.1844	0.3046	1143.0
470.0	0.1250	176.0	3.90	72.96	105.4	1.257	0.1841	0.3011	1156.0
480.0	0.1284	182.0	3.76	75.06	108.4	1.263	0.1837	0.2979	1169.0
490.0	0.1318	187.0	3.64	77.14	111.3	1.269	0.1834	0.2950	1181.0
500.0	0.1352	193.0	3.53	79.21	114.3	1.275	0.1831	0.2925	1194.0
510.0	0.1385	198.0	3.42	81.26	117.2	1.281	0.1829	0.2901	1206.0
520.0	0.1418	203.0	3.32	83.29	120.1	1.287	0.1827	0.2879	1218.0
530.0	0.1451	208.0	3.23	85.31	122.9	1.292	0.1825	0.2860	1230.0
540.0	0.1484	213.0	3.14	87.32	125.8	1.298	0.1823	0.2841	1241.0
550.0	0.1516	218.0	3.06	89.31	128.6	1.303	0.1821	0.2825	1253.0
560.0	0.1548	223.0	2.98	91.30	131.4	1.308	0.1820	0.2809	1264.0
570.0	0.1580	228.0	2.91	93.27	134.2	1.313	0.1819	0.2795	1275.0
580.0	0.1612	233.0	2.84	95.24	137.0	1.318	0.1817	0.2782	1286.0
590.0	0.1643	238.0	2.77	97.20	139.8	1.322	0.1816	0.2769	1297.0
600.0	0.1675	243.0	2.71	99.15	142.6	1.327	0.1816	0.2758	1308.0
700.0	0.1981	290.0	2.22	118.3	169.7	1.369	0.1812	0.2679	1408.0
800.0	0.2278	334.0	1.89	137.2	196.3	1.404	0.1819	0.2640	1499.0
900.0	0.2569	377.0	1.65	156.0	222.6	1.435	0.1832	0.2626	1582.0
1000.0	0.2856	419.0	1.46	174.8	248.8	1.463	0.1852	0.2626	1658.0
1500.0	0.4260	619.0	0.948	271.9	382.3	1.571	0.1997	0.2728	1980.0
2000.0	0.5642	814.0	0.705	375.6	521.3	1.651	0.2132	0.2850	2246.0
2500.0	0.7016	1010.0	0.562	485.0	666.8	1.716	0.2229	0.2943	2482.0
3000.0	0.8386	1200.0	0.467	598.3	815.7	1.770	0.2296	0.3007	2698.0
3500.0	0.9755	1390.0	0.400	714.4	967.3	1.817	0.2343	0.3053	2898.0

* TWO-PHASE BOUNDARY

1400 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DV)_V$ PSIA-CU FT/BTU	$-V(DP/DV)_T$ PSIA	$(DV/DT)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	54.12	218.0	14.8	103000.0	0.00213	0.0947	20.4	0.00378	1.46644	3.59
125.0	53.53	208.0	13.8	99600.0	0.00224	0.0920	17.6	0.00368	1.46079	3.21
130.0	52.32	199.0	13.1	73900.0	0.00236	0.0492	15.4	0.00359	1.45492	2.91
135.0	52.29	190.0	12.5	70000.0	0.00247	0.0864	13.8	0.00352	1.44885	2.69
140.0	51.53	182.0	12.0	62500.0	0.00253	0.0836	12.6	0.00345	1.44258	2.54
145.0	50.95	174.0	11.6	56100.0	0.00263	0.0803	11.7	0.00339	1.43614	2.43
150.0	50.26	168.0	11.2	50500.0	0.00280	0.0781	10.7	0.00332	1.42955	2.32
155.0	49.55	162.0	10.8	45600.0	0.00291	0.0754	9.88	0.00324	1.42281	2.21
160.0	48.82	156.0	10.5	41200.0	0.00302	0.0723	9.22	0.00317	1.41592	2.15
165.0	48.08	151.0	10.1	37200.0	0.00313	0.0702	8.61	0.00309	1.40890	2.08
170.0	47.31	146.0	9.75	33600.0	0.00326	0.0677	8.03	0.00301	1.40173	2.03
175.0	46.53	141.0	9.39	30300.0	0.00333	0.0652	7.49	0.00293	1.39442	1.98
180.0	45.74	136.0	9.04	27300.0	0.00351	0.0627	6.99	0.00285	1.38696	1.93
185.0	44.92	132.0	8.69	24500.0	0.00364	0.0603	6.51	0.00276	1.37933	1.89
190.0	44.08	127.0	8.36	22000.0	0.00385	0.0580	6.07	0.00268	1.37153	1.85
200.0	42.33	118.0	7.70	17400.0	0.00420	0.0534	5.26	0.00250	1.35534	1.79
205.0	41.41	114.0	7.39	15400.0	0.00443	0.0512	4.89	0.00242	1.34692	1.76
210.0	40.47	110.0	7.08	13600.0	0.00475	0.0490	4.54	0.00233	1.33826	1.74
215.0	39.49	105.0	6.77	11900.0	0.00504	0.0469	4.21	0.00224	1.32933	1.71
220.0	38.47	101.0	6.47	10400.0	0.00534	0.0449	3.90	0.00215	1.32009	1.69
225.0	37.42	96.2	6.18	8950.0	0.00576	0.0429	3.60	0.00207	1.31053	1.68
230.0	36.32	91.6	5.89	7660.0	0.00621	0.0409	3.32	0.00198	1.30058	1.66
235.0	35.16	87.0	5.60	6490.0	0.00673	0.0392	3.05	0.00190	1.29021	1.64
240.0	33.95	82.5	5.32	5450.0	0.00734	0.0375	2.79	0.00183	1.27937	1.62
245.0	32.67	78.0	5.04	4530.0	0.00803	0.0359	2.55	0.00176	1.26802	1.60
250.0	31.32	73.7	4.77	3740.0	0.00880	0.0344	2.33	0.00169	1.25613	1.58
255.0	29.91	69.7	4.50	3080.0	0.00962	0.0329	2.12	0.00164	1.24376	1.55
260.0	28.45	66.2	4.26	2560.0	0.0104	0.0313	1.93	0.00160	1.23101	1.53
265.0	26.96	63.3	4.03	2160.0	0.0111	0.0296	1.76	0.00157	1.21811	1.50
270.0	25.48	61.2	3.84	1870.0	0.0115	0.0278	1.62	0.00156	1.20538	1.47
275.0	24.05	59.6	3.68	1660.0	0.0116	0.0262	1.51	0.00157	1.19313	1.44
280.0	22.70	58.7	3.55	1510.0	0.0115	0.0246	1.41	0.00160	1.18161	1.40
285.0	21.44	58.3	3.44	1410.0	0.0112	0.0233	1.34	0.00165	1.17099	1.36
290.0	20.29	58.3	3.36	1350.0	0.0108	0.0221	1.29	0.00173	1.16133	1.32
295.0	19.24	58.6	3.29	1300.0	0.0103	0.0211	1.25	0.00181	1.15261	1.28
300.0	18.30	59.2	3.23	1270.0	0.00975	0.0202	1.21	0.00191	1.14479	1.25
310.0	16.69	61.0	3.14	1250.0	0.00866	0.0190	1.17	0.00215	1.13151	1.17
320.0	15.39	63.3	3.07	1250.0	0.00769	0.0181	1.15	0.00242	1.12079	1.11
330.0	14.31	65.9	3.02	1260.0	0.00685	0.0175	1.13	0.00271	1.11202	1.05
340.0	13.41	68.8	2.97	1270.0	0.00616	0.0172	1.13	0.00302	1.10472	1.00
350.0	12.64	71.8	2.93	1290.0	0.00560	0.0169	1.13	0.00333	1.09855	0.965
360.0	11.98	74.8	2.89	1300.0	0.00513	0.0167	1.13	0.00364	1.09324	0.933
370.0	11.41	78.0	2.86	1320.0	0.00473	0.0166	1.14	0.00395	1.08862	0.907
380.0	10.90	81.1	2.83	1330.0	0.00440	0.0166	1.14	0.00426	1.08456	0.885
390.0	10.45	84.2	2.80	1350.0	0.00411	0.0166	1.15	0.00458	1.08094	0.867
400.0	10.04	87.4	2.78	1360.0	0.00387	0.0166	1.16	0.00489	1.07769	0.852
410.0	9.668	90.5	2.76	1370.0	0.00365	0.0166	1.17	0.00520	1.07475	0.839
420.0	9.331	93.6	2.73	1380.0	0.00346	0.0167	1.18	0.00552	1.07208	0.828
430.0	9.021	96.7	2.71	1380.0	0.00329	0.0167	1.20	0.00584	1.06963	0.819
440.0	8.736	100.0	2.70	1390.0	0.00313	0.0168	1.21	0.00615	1.06738	0.810
450.0	8.473	103.0	2.68	1400.0	0.00300	0.0169	1.22	0.00647	1.06530	0.803
460.0	8.228	106.0	2.66	1410.0	0.00287	0.0170	1.24	0.00679	1.06337	0.796
470.0	7.999	109.0	2.65	1410.0	0.00276	0.0171	1.25	0.00712	1.06157	0.791
480.0	7.785	112.0	2.63	1420.0	0.00266	0.0173	1.26	0.00744	1.05989	0.785
490.0	7.585	115.0	2.62	1420.0	0.00256	0.0174	1.28	0.00777	1.05831	0.781
500.0	7.396	118.0	2.60	1420.0	0.00248	0.0175	1.29	0.00810	1.05684	0.777
510.0	7.218	121.0	2.59	1430.0	0.00239	0.0176	1.31	0.00843	1.05544	0.773
520.0	7.050	124.0	2.58	1430.0	0.00232	0.0178	1.32	0.00876	1.05412	0.769
530.0	6.891	127.0	2.57	1440.0	0.00225	0.0179	1.33	0.00910	1.05288	0.766
540.0	6.740	130.0	2.56	1440.0	0.00218	0.0181	1.35	0.00944	1.05170	0.763
550.0	6.596	133.0	2.55	1440.0	0.00212	0.0182	1.36	0.00978	1.05058	0.761
560.0	6.459	136.0	2.54	1440.0	0.00207	0.0184	1.38	0.0101	1.04951	0.758
570.0	6.329	139.0	2.53	1450.0	0.00201	0.0185	1.39	0.0105	1.04849	0.756
580.0	6.205	142.0	2.52	1450.0	0.00196	0.0187	1.41	0.0108	1.04752	0.754
590.0	6.085	145.0	2.51	1450.0	0.00191	0.0188	1.42	0.0112	1.04660	0.752
600.0	5.972	148.0	2.50	1450.0	0.00187	0.0190	1.43	0.0115	1.04571	0.750
700.0	5.048	176.0	2.43	1460.0	0.00152	0.0206	1.58	0.0153	1.03854	0.736
800.0	4.390	205.0	2.37	1470.0	0.00129	0.0223	1.71	0.0193	1.03346	0.728
900.0	3.892	234.0	2.31	1470.0	0.00112	0.0240	1.84	0.0235	1.02953	0.723
1000.0	3.501	263.0	2.26	1470.0	0.00100	0.0256	1.96	0.0281	1.02662	0.720
1500.0	2.343	418.0	2.02	1450.0	0.000652					
2000.0	1.774	584.0	1.86	1440.0	0.000438					
2500.0	1.425	752.0	1.77	1440.0	0.000341					
3000.0	1.192	921.0	1.71	1430.0	0.000327					
3500.0	1.025	1090.0	1.67	1430.0	0.000281					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

1500 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01845	1920.0	218.0	-63.07	-57.34	0.5940	0.2744	0.4622	3868.0
125.0	0.01865	1690.0	201.0	-60.80	-55.62	0.6129	0.2743	0.4661	3650.0
130.0	0.01887	1510.0	186.0	-58.53	-53.29	0.6313	0.2709	0.4675	3472.0
135.0	0.01910	1360.0	173.0	-56.25	-50.95	0.6489	0.2662	0.4677	3322.0
140.0	0.01934	1230.0	162.0	-53.98	-48.61	0.6659	0.2610	0.4674	3191.0
145.0	0.01959	1120.0	151.0	-51.72	-46.27	0.6823	0.2560	0.4672	3074.0
150.0	0.01985	1020.0	142.0	-49.45	-43.94	0.6981	0.2515	0.4672	2966.0
155.0	0.02014	937.0	133.0	-47.20	-41.60	0.7135	0.2474	0.4677	2864.0
160.0	0.02043	861.0	125.0	-44.94	-39.26	0.7283	0.2439	0.4687	2768.0
165.0	0.02075	791.0	117.0	-42.66	-36.91	0.7428	0.2409	0.4703	2675.0
170.0	0.02107	728.0	110.0	-40.41	-34.56	0.7568	0.2382	0.4725	2586.0
175.0	0.02142	669.0	104.0	-38.14	-32.19	0.7706	0.2360	0.4754	2499.0
180.0	0.02179	614.0	97.5	-35.85	-29.80	0.7840	0.2340	0.4789	2413.0
185.0	0.02217	563.0	91.6	-33.56	-27.40	0.7972	0.2323	0.4830	2330.0
190.0	0.02259	516.0	85.9	-31.24	-24.97	0.8101	0.2308	0.4878	2248.0
200.0	0.02343	430.0	75.5	-26.56	-20.04	0.8354	0.2282	0.4992	2087.0
205.0	0.02400	391.0	70.6	-24.19	-17.53	0.8478	0.2270	0.5060	2009.0
210.0	0.02454	354.0	66.0	-21.79	-14.98	0.8601	0.2260	0.5136	1932.0
215.0	0.02512	320.0	61.5	-19.36	-12.39	0.8723	0.2250	0.5221	1855.0
220.0	0.02575	288.0	57.2	-16.91	-9.763	0.8844	0.2240	0.5317	1779.0
225.0	0.02644	258.0	53.1	-14.41	-7.078	0.8965	0.2232	0.5424	1704.0
230.0	0.02720	230.0	49.2	-11.88	-4.336	0.9085	0.2224	0.5546	1629.0
235.0	0.02803	203.0	45.4	-9.316	-1.530	0.9206	0.2216	0.5683	1554.0
240.0	0.02896	179.0	41.8	-6.694	1.348	0.9327	0.2210	0.5835	1481.0
245.0	0.02999	157.0	38.3	-4.022	4.307	0.9449	0.2204	0.6003	1409.0
250.0	0.03115	138.0	34.9	-1.299	7.352	0.9572	0.2199	0.6179	1339.0
255.0	0.03246	121.0	31.7	1.470	10.49	0.9696	0.2194	0.6353	1272.0
260.0	0.03393	106.0	28.8	4.277	13.70	0.9821	0.2190	0.6506	1210.0
265.0	0.03558	95.0	26.0	7.103	16.98	0.9946	0.2185	0.6618	1155.0
270.0	0.03740	86.5	23.6	9.921	20.31	1.007	0.2179	0.6667	1107.0
275.0	0.03938	60.5	21.3	12.70	23.64	1.019	0.2172	0.6644	1068.0
280.0	0.04150	76.6	19.4	15.41	26.94	1.031	0.2162	0.6553	1037.0
285.0	0.04373	74.5	17.7	18.04	30.18	1.043	0.2150	0.6407	1014.0
290.0	0.04604	73.6	16.3	20.55	33.34	1.054	0.2135	0.6221	997.0
295.0	0.04840	73.9	15.0	22.96	36.40	1.064	0.2119	0.6013	985.3
300.0	0.05079	74.9	13.9	25.24	39.35	1.074	0.2102	0.5793	977.8
310.0	0.05556	78.7	12.1	29.49	44.92	1.092	0.2067	0.5357	971.8
320.0	0.06025	84.0	10.7	33.34	50.08	1.109	0.2034	0.4962	974.1
330.0	0.06479	90.1	9.59	36.87	54.87	1.123	0.2004	0.4625	981.4
340.0	0.06919	96.6	8.71	40.13	59.35	1.137	0.1978	0.4345	991.7
350.0	0.07343	103.0	7.99	43.18	63.57	1.149	0.1956	0.4116	1004.0
360.0	0.07753	110.0	7.39	46.06	67.59	1.160	0.1938	0.3927	1017.0
370.0	0.08150	117.0	6.89	48.80	71.44	1.171	0.1922	0.3770	1030.0
380.0	0.08537	123.0	6.45	51.43	75.14	1.181	0.1908	0.3640	1044.0
390.0	0.08913	130.0	6.08	53.97	78.73	1.190	0.1896	0.3530	1058.0
400.0	0.09281	136.0	5.75	56.43	82.21	1.199	0.1886	0.3436	1072.0
410.0	0.09641	142.0	5.46	58.82	85.60	1.207	0.1878	0.3355	1086.0
420.0	0.0999	149.0	5.20	61.16	88.92	1.215	0.1870	0.3286	1100.0
430.0	0.1034	155.0	4.97	63.45	92.18	1.223	0.1864	0.3225	1113.0
440.0	0.1068	161.0	4.76	65.70	95.37	1.230	0.1858	0.3171	1127.0
450.0	0.1102	166.0	4.57	67.92	98.52	1.237	0.1853	0.3124	1140.0
460.0	0.1135	172.0	4.40	70.10	101.6	1.244	0.1848	0.3082	1153.0
470.0	0.1168	178.0	4.24	72.25	104.7	1.251	0.1844	0.3045	1166.0
480.0	0.1200	183.0	4.09	74.38	107.7	1.257	0.1841	0.3011	1178.0
490.0	0.1232	189.0	3.96	76.49	110.7	1.263	0.1838	0.2980	1191.0
500.0	0.1264	194.0	3.83	78.57	113.7	1.269	0.1835	0.2953	1203.0
510.0	0.1295	199.0	3.71	80.64	116.6	1.275	0.1832	0.2927	1215.0
520.0	0.1326	205.0	3.60	82.69	119.5	1.281	0.1830	0.2904	1227.0
530.0	0.1357	210.0	3.50	84.73	122.4	1.286	0.1828	0.2883	1238.0
540.0	0.1388	215.0	3.40	86.75	125.3	1.292	0.1826	0.2864	1250.0
550.0	0.1418	220.0	3.31	88.76	128.2	1.297	0.1824	0.2846	1261.0
560.0	0.1448	225.0	3.23	90.76	131.0	1.302	0.1823	0.2830	1272.0
570.0	0.1478	230.0	3.15	92.75	133.8	1.307	0.1821	0.2814	1284.0
580.0	0.1508	235.0	3.07	94.73	136.6	1.312	0.1820	0.2800	1294.0
590.0	0.1538	240.0	3.00	96.70	139.4	1.317	0.1819	0.2787	1305.0
600.0	0.1567	245.0	2.93	98.67	142.2	1.321	0.1818	0.2775	1316.0
700.0	0.1855	292.0	2.39	118.0	169.5	1.363	0.1814	0.2691	1416.0
800.0	0.2133	336.0	2.03	136.9	196.1	1.399	0.1820	0.2649	1506.0
900.0	0.2406	379.0	1.77	155.7	222.5	1.430	0.1834	0.2632	1589.0
1000.0	0.2674	421.0	1.57	174.6	248.8	1.458	0.1854	0.2632	1665.0
1500.0	0.3986	623.0	1.02	271.8	382.5	1.566	0.1998	0.2730	1986.0
2000.0	0.5277	818.0	0.755	375.6	522.1	1.646	0.2132	0.2852	2251.0
2500.0	0.6560	1010.0	0.602	484.9	667.1	1.711	0.2230	0.2943	2487.0
3000.0	0.7839	1200.0	0.501	598.3	816.0	1.765	0.2297	0.3008	2702.0
3500.0	0.9116	1390.0	0.429	714.4	967.6	1.812	0.2344	0.3053	2902.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

1500 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DU)$_V$ PSIA-CU FT/BTU	-V(DP/DV)$_T$ PSIA	(DV/DT)/V$_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	54.17	220.0	14.7	104000.0	0.00210	0.0950	20.7	0.00379	1.46694	3.62
125.0	53.59	211.0	13.7	90700.0	0.00221	0.0923	17.8	0.00369	1.46136	3.24
130.0	52.99	201.0	13.0	79900.0	0.00233	0.0895	15.6	0.00361	1.45556	2.93
135.0	52.36	192.0	12.4	71000.0	0.00244	0.0867	13.9	0.00354	1.44956	2.71
140.0	51.71	184.0	12.0	63500.0	0.00255	0.0840	12.7	0.00347	1.44336	2.55
145.0	51.04	176.0	11.6	57000.0	0.00265	0.0812	11.8	0.00341	1.43700	2.44
150.0	50.36	169.0	11.2	51500.0	0.00276	0.0785	10.9	0.00334	1.43049	2.33
155.0	49.66	163.0	10.8	46500.0	0.00286	0.0759	10.0	0.00327	1.42383	2.22
160.0	48.94	158.0	10.5	42100.0	0.00297	0.0732	9.33	0.00319	1.41703	2.15
165.0	48.20	153.0	10.1	38100.0	0.00308	0.0707	8.71	0.00312	1.41010	2.09
170.0	47.45	148.0	9.77	34500.0	0.00320	0.0682	8.13	0.00304	1.40304	2.03
175.0	46.69	143.0	9.42	31200.0	0.00332	0.0657	7.59	0.00296	1.39584	1.98
180.0	45.90	138.0	9.08	28200.0	0.00345	0.0633	7.09	0.00288	1.38850	1.93
185.0	45.10	134.0	8.74	25400.0	0.00360	0.0609	6.62	0.00280	1.38101	1.89
190.0	44.28	130.0	8.41	22800.0	0.00376	0.0586	6.17	0.00271	1.37336	1.85
200.0	42.57	121.0	7.77	18300.0	0.00413	0.0541	5.37	0.00254	1.35753	1.78
205.0	41.67	117.0	7.47	16300.0	0.00434	0.0519	5.00	0.00246	1.34933	1.75
210.0	40.76	112.0	7.16	14400.0	0.00457	0.0497	4.65	0.00238	1.34091	1.73
215.0	39.81	108.0	6.87	12700.0	0.00483	0.0477	4.32	0.00229	1.33226	1.70
220.0	38.83	104.0	6.58	11200.0	0.00512	0.0456	4.01	0.00221	1.32335	1.68
225.0	37.82	99.5	6.30	9750.0	0.00545	0.0437	3.72	0.00213	1.31417	1.66
230.0	36.77	95.1	6.02	8440.0	0.00583	0.0418	3.44	0.00205	1.30467	1.64
235.0	35.68	90.8	5.74	7260.0	0.00626	0.0400	3.17	0.00197	1.29484	1.62
240.0	34.54	86.5	5.47	6190.0	0.00675	0.0383	2.92	0.00190	1.28463	1.60
245.0	33.35	82.3	5.21	5240.0	0.00730	0.0368	2.68	0.00184	1.27402	1.58
250.0	32.10	78.2	4.95	4420.0	0.00790	0.0353	2.46	0.00178	1.26301	1.55
255.0	30.81	74.3	4.70	3710.0	0.00855	0.0338	2.25	0.00173	1.25161	1.52
260.0	29.47	70.9	4.46	3130.0	0.00913	0.0323	2.06	0.00169	1.23991	1.50
265.0	28.11	67.9	4.24	2670.0	0.00975	0.0307	1.90	0.00165	1.22803	1.47
270.0	26.74	65.4	4.04	2310.0	0.0102	0.0291	1.75	0.00163	1.21618	1.44
275.0	25.39	63.6	3.87	2040.0	0.0104	0.0275	1.62	0.00163	1.20460	1.41
280.0	24.10	62.3	3.73	1850.0	0.0105	0.0260	1.52	0.00165	1.19350	1.38
285.0	22.87	61.6	3.60	1700.0	0.0104	0.0246	1.44	0.00168	1.18305	1.35
290.0	21.72	61.2	3.51	1600.0	0.0102	0.0234	1.37	0.00173	1.17336	1.31
295.0	20.66	61.2	3.42	1530.0	0.00982	0.0223	1.32	0.00180	1.16445	1.28
300.0	19.69	61.5	3.36	1470.0	0.00942	0.0214	1.28	0.00188	1.15633	1.25
310.0	18.00	62.8	3.25	1420.0	0.00853	0.0200	1.22	0.00207	1.14228	1.18
320.0	16.60	64.7	3.17	1390.0	0.00767	0.0190	1.19	0.00231	1.13073	1.12
330.0	15.43	67.0	3.10	1390.0	0.00690	0.0183	1.17	0.00257	1.12118	1.06
340.0	14.45	69.7	3.05	1400.0	0.00624	0.0179	1.16	0.00284	1.11320	1.01
350.0	13.62	72.5	3.00	1410.0	0.00563	0.0175	1.15	0.00313	1.10642	0.975
360.0	12.90	75.4	2.96	1420.0	0.00521	0.0173	1.15	0.00342	1.10060	0.942
370.0	12.27	78.4	2.92	1430.0	0.00481	0.0172	1.16	0.00371	1.09553	0.915
380.0	11.71	81.5	2.89	1450.0	0.00447	0.0171	1.16	0.00401	1.09107	0.893
390.0	11.22	84.6	2.86	1460.0	0.00417	0.0170	1.17	0.00430	1.08711	0.874
400.0	10.77	87.7	2.83	1470.0	0.00392	0.0170	1.18	0.00460	1.08356	0.858
410.0	10.37	90.8	2.80	1480.0	0.00370	0.0170	1.19	0.00489	1.08035	0.845
420.0	10.01	93.9	2.78	1490.0	0.00350	0.0171	1.20	0.00519	1.07744	0.833
430.0	9.671	97.0	2.76	1500.0	0.00333	0.0171	1.21	0.00549	1.07477	0.823
440.0	9.362	100.0	2.74	1500.0	0.00317	0.0172	1.22	0.00578	1.07232	0.814
450.0	9.076	103.0	2.72	1510.0	0.00303	0.0173	1.24	0.00608	1.07006	0.806
460.0	8.811	106.0	2.70	1520.0	0.00290	0.0173	1.25	0.00639	1.06797	0.799
470.0	8.564	109.0	2.68	1520.0	0.00279	0.0174	1.26	0.00669	1.06602	0.793
480.0	8.333	112.0	2.67	1530.0	0.00268	0.0176	1.28	0.00700	1.06420	0.788
490.0	8.117	115.0	2.65	1530.0	0.00258	0.0177	1.29	0.00730	1.06250	0.783
500.0	7.913	118.0	2.64	1540.0	0.00249	0.0178	1.30	0.00761	1.06090	0.779
510.0	7.722	121.0	2.62	1540.0	0.00241	0.0179	1.32	0.00793	1.05939	0.775
520.0	7.541	124.0	2.61	1540.0	0.00234	0.0180	1.33	0.00824	1.05797	0.771
530.0	7.369	127.0	2.60	1550.0	0.00225	0.0182	1.34	0.00856	1.05662	0.768
540.0	7.207	130.0	2.59	1550.0	0.00220	0.0183	1.36	0.00888	1.05535	0.765
550.0	7.052	133.0	2.58	1550.0	0.00214	0.0185	1.37	0.00920	1.05414	0.762
560.0	6.905	136.0	2.57	1550.0	0.00208	0.0186	1.39	0.00952	1.05299	0.759
570.0	6.765	139.0	2.55	1560.0	0.00202	0.0188	1.40	0.00985	1.05190	0.757
580.0	6.632	142.0	2.55	1560.0	0.00197	0.0189	1.42	0.0102	1.05085	0.755
590.0	6.504	145.0	2.54	1560.0	0.00192	0.0191	1.43	0.0105	1.04986	0.753
600.0	6.381	148.0	2.53	1560.0	0.00188	0.0192	1.44	0.0108	1.04890	0.751
700.0	5.392	177.0	2.45	1570.0	0.00152	0.0208	1.58	0.0143	1.04121	0.737
800.0	4.688	205.0	2.38	1580.0	0.00123	0.0225	1.72	0.0181	1.03576	0.729
900.0	4.157	234.0	2.33	1580.0	0.00112	0.0242	1.85	0.0221	1.03166	0.724
1000.0	3.739	264.0	2.27	1580.0	0.00100	0.0259	1.97	0.0263	1.02845	0.720
1500.0	2.509	419.0	2.03	1560.0	0.000631					
2000.0	1.895	585.0	1.87	1550.0	0.000487					
2500.0	1.524	754.0	1.77	1540.0	0.000390					
3000.0	1.276	922.0	1.71	1530.0	0.000326					
3500.0	1.097	1090.0	1.67	1530.0	0.000230					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

2000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
120.0	0.01837	2010.0	216.0	-63.46	-56.65	0.5905	0.2836	0.4569	3873.0
125.0	0.01855	1780.0	193.0	-61.23	-54.36	0.6092	0.2826	0.4604	3667.0
130.0	0.01873	1600.0	186.0	-59.00	-52.06	0.6273	0.2785	0.4614	3500.0
135.0	0.01897	1440.0	174.0	-56.77	-49.75	0.6447	0.2730	0.4613	3359.0
140.0	0.01913	1310.0	163.0	-54.55	-47.44	0.6615	0.2672	0.4608	3237.0
145.0	0.01943	1200.0	153.0	-52.33	-45.14	0.6777	0.2617	0.4602	3128.0
150.0	0.01967	1100.0	145.0	-50.13	-42.84	0.6933	0.2566	0.4599	3029.0
155.0	0.01993	1020.0	136.0	-47.92	-40.54	0.7083	0.2520	0.4599	2935.0
160.0	0.02020	943.0	129.0	-45.72	-38.24	0.7229	0.2481	0.4602	2847.0
165.0	0.02049	874.0	121.0	-43.53	-35.94	0.7371	0.2447	0.4611	2762.0
170.0	0.02079	811.0	115.0	-41.33	-33.63	0.7509	0.2417	0.4623	2681.0
175.0	0.02110	752.0	108.0	-39.13	-31.31	0.7643	0.2391	0.4641	2601.0
180.0	0.02143	698.0	102.0	-36.92	-28.99	0.7774	0.2369	0.4663	2523.0
185.0	0.02177	648.0	96.6	-34.71	-26.65	0.7902	0.2349	0.4689	2448.0
190.0	0.02214	601.0	91.2	-32.50	-24.30	0.8028	0.2331	0.4718	2373.0
200.0	0.02292	515.0	81.2	-28.04	-19.55	0.8272	0.2300	0.4788	2229.0
205.0	0.02335	476.0	76.5	-25.79	-17.14	0.8390	0.2286	0.4828	2159.0
210.0	0.02380	440.0	72.1	-23.53	-14.72	0.8507	0.2274	0.4872	2090.0
215.0	0.02428	406.0	67.8	-21.26	-12.27	0.8622	0.2261	0.4918	2023.0
220.0	0.02478	374.0	63.8	-18.98	-9.808	0.8736	0.2250	0.4967	1957.0
225.0	0.02532	345.0	59.9	-16.68	-7.311	0.8848	0.2238	0.5020	1892.0
230.0	0.02590	317.0	56.2	-14.37	-4.787	0.8959	0.2228	0.5076	1829.0
235.0	0.02651	291.0	52.7	-12.05	-2.235	0.9069	0.2217	0.5135	1766.0
240.0	0.02717	267.0	49.3	-9.716	0.3471	0.9178	0.2207	0.5197	1706.0
245.0	0.02788	244.0	46.1	-7.363	2.962	0.9285	0.2197	0.5262	1646.0
250.0	0.02864	224.0	43.0	-4.997	5.603	0.9392	0.2187	0.5328	1589.0
255.0	0.02946	205.0	40.1	-2.620	8.290	0.9499	0.2178	0.5393	1533.0
260.0	0.03034	188.0	37.3	-0.2350	11.00	0.9604	0.2169	0.5456	1480.0
265.0	0.03129	173.0	34.7	2.155	13.74	0.9708	0.2160	0.5511	1429.0
270.0	0.03231	160.0	32.3	4.545	16.51	0.9812	0.2151	0.5555	1382.0
275.0	0.03340	148.0	30.0	6.926	19.30	0.9914	0.2142	0.5584	1338.0
280.0	0.03455	139.0	27.9	9.291	22.09	1.001	0.2133	0.5595	1299.0
285.0	0.03580	131.0	25.9	11.63	24.89	1.011	0.2124	0.5584	1264.0
290.0	0.03709	125.0	24.1	13.94	27.67	1.021	0.2115	0.5552	1233.0
295.0	0.03845	120.0	22.5	16.20	30.44	1.031	0.2105	0.5500	1207.0
300.0	0.03985	117.0	21.0	18.41	33.17	1.040	0.2094	0.5429	1185.0
310.0	0.04278	113.0	18.5	22.67	38.51	1.057	0.2072	0.5248	1152.0
320.0	0.04582	112.0	16.4	26.69	43.66	1.074	0.2049	0.5036	1130.0
330.0	0.04891	114.0	14.7	30.47	48.58	1.089	0.2027	0.4814	1118.0
340.0	0.05201	116.0	13.3	34.02	53.29	1.103	0.2005	0.4599	1112.0
350.0	0.05509	120.0	12.2	37.38	57.78	1.116	0.1985	0.4398	1112.0
360.0	0.05813	125.0	11.2	40.56	62.09	1.128	0.1966	0.4216	1114.0
370.0	0.06113	130.0	10.3	43.58	66.22	1.139	0.1950	0.4054	1120.0
380.0	0.06407	136.0	9.63	46.47	70.20	1.150	0.1935	0.3912	1127.0
390.0	0.06695	141.0	9.01	49.25	74.05	1.160	0.1923	0.3786	1135.0
400.0	0.06980	147.0	8.46	51.93	77.78	1.169	0.1911	0.3676	1144.0
410.0	0.07258	153.0	8.01	54.53	81.41	1.176	0.1902	0.3580	1154.0
420.0	0.07532	159.0	7.59	57.05	84.95	1.187	0.1893	0.3495	1165.0
430.0	0.07801	164.0	7.22	59.51	88.40	1.195	0.1885	0.3421	1176.0
440.0	0.08067	170.0	6.88	61.92	91.79	1.203	0.1878	0.3354	1187.0
450.0	0.08328	176.0	6.56	64.27	95.11	1.210	0.1872	0.3295	1198.0
460.0	0.08586	182.0	6.31	66.59	98.38	1.217	0.1867	0.3242	1209.0
470.0	0.08840	187.0	6.06	68.86	101.6	1.224	0.1862	0.3195	1220.0
480.0	0.09091	193.0	5.83	71.10	104.8	1.231	0.1858	0.3152	1231.0
490.0	0.09340	198.0	5.62	73.32	107.9	1.237	0.1854	0.3114	1242.0
500.0	0.09585	204.0	5.42	75.50	111.0	1.244	0.1850	0.3079	1253.0
510.0	0.09829	209.0	5.25	77.66	114.1	1.250	0.1847	0.3047	1265.0
520.0	0.1007	215.0	5.08	79.80	117.1	1.256	0.1844	0.3018	1275.0
530.0	0.1031	220.0	4.92	81.92	120.1	1.261	0.1842	0.2991	1286.0
540.0	0.1055	225.0	4.78	84.02	123.1	1.267	0.1839	0.2966	1297.0
550.0	0.1078	230.0	4.64	86.11	126.0	1.272	0.1837	0.2944	1308.0
560.0	0.1101	236.0	4.51	88.18	128.9	1.278	0.1835	0.2923	1318.0
570.0	0.1125	241.0	4.39	90.23	131.9	1.283	0.1834	0.2904	1329.0
580.0	0.1148	246.0	4.28	92.28	134.8	1.288	0.1832	0.2886	1339.0
590.0	0.1170	251.0	4.17	94.31	137.7	1.293	0.1831	0.2869	1349.0
600.0	0.1193	256.0	4.07	96.33	140.5	1.298	0.1829	0.2854	1360.0
700.0	0.1414	304.0	3.29	116.1	169.5	1.341	0.1824	0.2745	1456.0
800.0	0.1627	350.0	2.77	135.3	195.6	1.377	0.1828	0.2690	1544.0
900.0	0.1835	394.0	2.40	154.4	222.3	1.408	0.1840	0.2664	1625.0
1000.0	0.2036	436.0	2.13	173.4	248.9	1.436	0.1859	0.2657	1699.0
1500.0	0.3030	640.0	1.36	271.2	383.4	1.545	0.2001	0.2741	2015.0
2000.0	0.4030	836.0	1.01	375.2	523.4	1.626	0.2135	0.2857	2277.0
2500.0	0.4964	1030.0	0.803	484.8	668.6	1.691	0.2231	0.2946	2509.0
3000.0	0.5924	1220.0	0.668	598.2	817.6	1.745	0.2298	0.3009	2723.0
3500.0	0.6882	1410.0	0.572	714.3	969.2	1.792	0.2345	0.3054	2921.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

2000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DU)$_V$ PSIA-CU FT/BTU	-V(DP/DV)$_T$ PSIA	(DV/DT)/V$_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^3	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
120.0	54.43	232.0	14.0	109000.0	0.00197	0.0963	22.2	0.00387	1.46939	3.79
125.0	53.88	222.0	13.1	96000.0	0.00206	0.0937	19.1	0.00378	1.46413	3.39
130.0	53.31	211.0	12.5	85100.0	0.00218	0.0910	16.7	0.00370	1.45865	3.05
135.0	52.72	202.0	12.1	76000.0	0.00223	0.0884	14.8	0.00363	1.45298	2.78
140.0	52.11	193.0	11.7	68400.0	0.00233	0.0857	13.4	0.00357	1.44712	2.60
145.0	51.48	185.0	11.4	61800.0	0.00243	0.0831	12.4	0.00351	1.44111	2.47
150.0	50.83	179.0	11.1	56100.0	0.00257	0.0805	11.5	0.00344	1.43496	2.37
155.0	50.17	173.0	10.8	51100.0	0.00267	0.0779	10.6	0.00338	1.42867	2.26
160.0	49.49	167.0	10.5	46700.0	0.00275	0.0754	9.84	0.00331	1.42227	2.16
165.0	48.80	162.0	10.2	42700.0	0.00285	0.0729	9.22	0.00324	1.41577	2.10
170.0	48.10	157.0	9.86	39000.0	0.00294	0.0705	8.64	0.00317	1.40916	2.04
175.0	47.39	153.0	9.56	35700.0	0.00304	0.0681	8.10	0.00310	1.40245	1.99
180.0	46.66	149.0	9.25	32600.0	0.00314	0.0658	7.59	0.00302	1.39564	1.94
185.0	45.93	144.0	8.96	29700.0	0.00323	0.0635	7.12	0.00295	1.38872	1.89
190.0	45.17	140.0	8.66	27100.0	0.00336	0.0613	6.67	0.00287	1.38170	1.85
200.0	43.63	133.0	8.09	22500.0	0.00361	0.0570	5.86	0.00273	1.36733	1.77
205.0	42.83	129.0	7.81	20400.0	0.00375	0.0549	5.50	0.00266	1.35998	1.74
210.0	42.02	125.0	7.54	18500.0	0.00393	0.0529	5.15	0.00259	1.35250	1.71
215.0	41.19	121.0	7.28	16700.0	0.00405	0.0510	4.83	0.00252	1.34490	1.68
220.0	40.35	118.0	7.02	15100.0	0.00422	0.0491	4.52	0.00245	1.33718	1.65
225.0	39.49	114.0	6.78	13600.0	0.00440	0.0472	4.24	0.00238	1.32932	1.62
230.0	38.61	110.0	6.53	12200.0	0.00453	0.0454	3.96	0.00232	1.32134	1.59
235.0	37.72	107.0	6.30	11000.0	0.00480	0.0437	3.71	0.00226	1.31321	1.57
240.0	36.80	103.0	6.07	9810.0	0.00502	0.0421	3.47	0.00220	1.30495	1.54
245.0	35.87	100.0	5.85	8760.0	0.00526	0.0406	3.24	0.00215	1.29654	1.51
250.0	34.91	96.7	5.63	7810.0	0.00551	0.0391	3.03	0.00210	1.28801	1.48
255.0	33.94	93.5	5.42	6950.0	0.00577	0.0378	2.83	0.00206	1.27935	1.45
260.0	32.96	90.5	5.22	6190.0	0.00603	0.0364	2.64	0.00203	1.27058	1.42
265.0	31.96	87.7	5.03	5520.0	0.00629	0.0352	2.47	0.00200	1.26174	1.39
270.0	30.95	85.0	4.85	4940.0	0.00653	0.0339	2.31	0.00197	1.25285	1.36
275.0	29.94	82.7	4.67	4440.0	0.00675	0.0326	2.17	0.00195	1.24398	1.34
280.0	28.93	80.7	4.51	4020.0	0.00693	0.0313	2.04	0.00193	1.23518	1.31
285.0	27.94	79.0	4.36	3660.0	0.00707	0.0301	1.92	0.00193	1.22652	1.28
290.0	26.96	77.6	4.23	3370.0	0.00715	0.0288	1.82	0.00193	1.21807	1.26
295.0	26.01	76.5	4.11	3130.0	0.00713	0.0277	1.73	0.00194	1.20988	1.23
300.0	25.09	75.8	4.00	2930.0	0.00717	0.0267	1.65	0.00196	1.20201	1.21
310.0	23.37	75.0	3.82	2640.0	0.00700	0.0249	1.53	0.00203	1.18735	1.16
320.0	21.82	75.1	3.67	2450.0	0.00670	0.0235	1.44	0.00214	1.17424	1.12
330.0	20.45	76.0	3.55	2320.0	0.00634	0.0224	1.38	0.00227	1.16266	1.07
340.0	19.23	77.3	3.45	2240.0	0.00595	0.0215	1.34	0.00244	1.15248	1.03
350.0	18.15	79.1	3.37	2180.0	0.00556	0.0209	1.31	0.00262	1.14355	1.00
360.0	17.20	81.1	3.30	2150.0	0.00520	0.0204	1.30	0.00281	1.13570	0.965
370.0	16.36	83.5	3.24	2130.0	0.00486	0.0200	1.28	0.00301	1.12876	0.938
380.0	15.61	85.9	3.19	2120.0	0.00453	0.0197	1.28	0.00323	1.12260	0.914
390.0	14.93	88.6	3.14	2110.0	0.00427	0.0195	1.28	0.00344	1.11711	0.894
400.0	14.33	91.3	3.10	2110.0	0.00403	0.0193	1.28	0.00366	1.11217	0.876
410.0	13.78	94.1	3.06	2100.0	0.00380	0.0192	1.28	0.00389	1.10770	0.861
420.0	13.28	97.0	3.02	2110.0	0.00360	0.0191	1.29	0.00411	1.10365	0.848
430.0	12.82	100.0	2.99	2110.0	0.00342	0.0190	1.29	0.00434	1.09995	0.836
440.0	12.40	103.0	2.96	2110.0	0.00326	0.0190	1.30	0.00457	1.09656	0.826
450.0	12.01	106.0	2.93	2110.0	0.00312	0.0190	1.31	0.00480	1.09343	0.817
460.0	11.65	109.0	2.90	2120.0	0.00293	0.0190	1.32	0.00503	1.09054	0.809
470.0	11.31	112.0	2.88	2120.0	0.00286	0.0190	1.33	0.00527	1.08785	0.802
480.0	11.00	115.0	2.85	2120.0	0.00275	0.0191	1.34	0.00550	1.08535	0.796
490.0	10.71	118.0	2.83	2120.0	0.00265	0.0191	1.35	0.00574	1.08302	0.791
500.0	10.43	121.0	2.81	2130.0	0.00255	0.0192	1.36	0.00598	1.08083	0.785
510.0	10.17	124.0	2.79	2130.0	0.00246	0.0193	1.37	0.00622	1.07877	0.781
520.0	9.930	127.0	2.77	2130.0	0.00238	0.0194	1.39	0.00647	1.07684	0.777
530.0	9.700	130.0	2.76	2130.0	0.00231	0.0195	1.40	0.00671	1.07501	0.773
540.0	9.482	133.0	2.74	2140.0	0.00224	0.0196	1.41	0.00696	1.07328	0.769
550.0	9.276	136.0	2.72	2140.0	0.00217	0.0197	1.42	0.00720	1.07164	0.766
560.0	9.079	139.0	2.71	2140.0	0.00211	0.0198	1.44	0.00745	1.07009	0.763
570.0	8.892	141.0	2.69	2140.0	0.00205	0.0199	1.45	0.00771	1.06861	0.761
580.0	8.714	144.0	2.68	2140.0	0.00200	0.0200	1.46	0.00795	1.06720	0.758
590.0	8.544	147.0	2.67	2140.0	0.00195	0.0201	1.47	0.00822	1.06586	0.756
600.0	8.381	150.0	2.65	2140.0	0.00190	0.0203	1.49	0.00847	1.06458	0.754
700.0	7.072	179.0	2.55	2150.0	0.00153	0.0217	1.62	0.0112	1.05429	0.738
800.0	6.146	209.0	2.47	2150.0	0.00129	0.0232	1.75	0.0140	1.04707	0.729
900.0	5.451	238.0	2.40	2150.0	0.00112	0.0248	1.87	0.0171	1.04167	0.724
1000.0	4.906	267.0	2.33	2140.0	0.000933	0.0265	1.99	0.0203	1.03744	0.720
1500.0	3.301	425.0	2.06	2110.0	0.000645					
2000.0	2.500	592.0	1.89	2090.0	0.000483					
2500.0	2.015	761.0	1.79	2070.0	0.000387					
3000.0	1.688	929.0	1.72	2060.0	0.000324					
3500.0	1.453	1100.0	1.68	2050.0	0.000278					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

3000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
125.0	0.01838	1960.0	136.0	-61.98	-51.79	0.6026	0.2968	0.4501	3713.0
130.0	0.01855	1770.0	184.0	-59.83	-43.52	0.6202	0.2913	0.4506	3562.0
135.0	0.01874	1610.0	174.0	-57.68	-47.27	0.6372	0.2845	0.4500	3436.0
140.0	0.01893	1480.0	165.0	-55.54	-45.02	0.6536	0.2776	0.4492	3329.0
145.0	0.01914	1360.0	157.0	-53.41	-42.78	0.6693	0.2710	0.4484	3233.0
150.0	0.01935	1270.0	149.0	-51.29	-40.54	0.6845	0.2650	0.4477	3147.0
155.0	0.01958	1180.0	142.0	-49.18	-38.30	0.6992	0.2596	0.4472	3067.0
160.0	0.01981	1100.0	135.0	-47.07	-36.07	0.7134	0.2549	0.4470	2991.0
165.0	0.02006	1030.0	128.0	-44.97	-33.83	0.7271	0.2509	0.4470	2919.0
170.0	0.02031	969.0	122.0	-42.88	-31.60	0.7405	0.2473	0.4473	2849.0
175.0	0.02058	911.0	116.0	-40.79	-29.36	0.7535	0.2442	0.4478	2781.0
180.0	0.02085	857.0	111.0	-38.70	-27.12	0.7661	0.2415	0.4486	2715.0
185.0	0.02114	806.0	105.0	-36.62	-24.87	0.7784	0.2391	0.4496	2650.0
190.0	0.02144	759.0	100.0	-34.53	-22.62	0.7904	0.2370	0.4508	2587.0
200.0	0.02207	674.0	90.7	-30.36	-18.10	0.8136	0.2333	0.4536	2464.0
205.0	0.02240	635.0	86.3	-28.27	-15.83	0.8248	0.2316	0.4551	2405.0
210.0	0.02275	599.0	82.1	-26.19	-13.55	0.8358	0.2301	0.4567	2346.0
215.0	0.02311	564.0	78.1	-24.10	-11.26	0.8466	0.2286	0.4584	2290.0
220.0	0.02343	532.0	74.2	-22.01	-8.975	0.8571	0.2273	0.4601	2234.0
225.0	0.02388	502.0	70.6	-19.93	-6.670	0.8675	0.2259	0.4617	2180.0
230.0	0.02423	474.0	67.1	-17.84	-4.357	0.8776	0.2246	0.4634	2128.0
235.0	0.02472	447.0	63.7	-15.76	-2.037	0.8876	0.2234	0.4650	2077.0
240.0	0.02516	422.0	60.6	-13.68	0.2912	0.8974	0.2221	0.4665	2027.0
245.0	0.02563	399.0	57.5	-11.60	2.628	0.9071	0.2209	0.4680	1979.0
250.0	0.02611	377.0	54.6	-9.533	4.971	0.9165	0.2197	0.4694	1932.0
255.0	0.02661	357.0	51.9	-7.463	7.321	0.9258	0.2186	0.4706	1887.0
260.0	0.02714	338.0	49.3	-5.399	9.677	0.9350	0.2174	0.4718	1844.0
265.0	0.02769	321.0	46.8	-3.341	12.04	0.9440	0.2163	0.4727	1802.0
270.0	0.02826	305.0	44.4	-1.293	14.40	0.9528	0.2152	0.4734	1762.0
275.0	0.02885	290.0	42.1	0.7449	16.77	0.9615	0.2142	0.4739	1724.0
280.0	0.02947	276.0	40.0	2.772	19.14	0.9701	0.2131	0.4740	1687.0
285.0	0.03011	264.0	38.0	4.786	21.51	0.9784	0.2121	0.4738	1652.0
290.0	0.03077	253.0	36.1	6.784	23.88	0.9867	0.2111	0.4732	1620.0
295.0	0.03145	243.0	34.3	8.765	26.24	0.9948	0.2101	0.4721	1589.0
300.0	0.03217	234.0	32.6	10.73	28.60	1.003	0.2092	0.4706	1561.0
310.0	0.03366	219.0	29.5	14.59	33.29	1.018	0.2073	0.4662	1510.0
320.0	0.03522	208.0	26.8	18.35	37.92	1.033	0.2055	0.4600	1467.0
330.0	0.03686	200.0	24.4	22.00	42.48	1.047	0.2038	0.4522	1432.0
340.0	0.03855	194.0	22.4	25.54	46.96	1.060	0.2022	0.4434	1404.0
350.0	0.04028	191.0	20.6	28.97	51.34	1.073	0.2006	0.4338	1382.0
360.0	0.04204	189.0	19.0	32.28	55.63	1.085	0.1992	0.4239	1366.0
370.0	0.04382	189.0	17.6	35.48	59.82	1.096	0.1978	0.4140	1354.0
380.0	0.04562	190.0	16.4	38.57	63.91	1.107	0.1966	0.4043	1345.0
390.0	0.04742	192.0	15.3	41.57	67.91	1.116	0.1954	0.3950	1340.0
400.0	0.04922	194.0	14.4	44.47	71.81	1.128	0.1943	0.3861	1337.0
410.0	0.05101	197.0	13.6	47.29	75.63	1.137	0.1933	0.3778	1336.0
420.0	0.05280	201.0	12.8	50.04	79.37	1.146	0.1924	0.3700	1337.0
430.0	0.05457	205.0	12.1	52.72	83.03	1.155	0.1916	0.3628	1339.0
440.0	0.05634	209.0	11.5	55.33	86.63	1.163	0.1909	0.3561	1343.0
450.0	0.05808	213.0	11.0	57.89	90.16	1.171	0.1902	0.3499	1347.0
460.0	0.05982	218.0	10.5	60.40	93.63	1.178	0.1896	0.3442	1353.0
470.0	0.06154	222.0	10.1	62.85	97.04	1.186	0.1890	0.3389	1359.0
480.0	0.06325	227.0	9.64	65.27	100.4	1.193	0.1885	0.3341	1365.0
490.0	0.06494	232.0	9.26	67.65	103.7	1.200	0.1881	0.3296	1372.0
500.0	0.06662	237.0	8.91	69.99	107.0	1.206	0.1876	0.3255	1379.0
510.0	0.06828	242.0	8.59	72.30	110.2	1.213	0.1872	0.3217	1387.0
520.0	0.06993	246.0	8.29	74.59	113.4	1.219	0.1869	0.3182	1394.0
530.0	0.07157	251.0	8.01	76.84	116.6	1.225	0.1866	0.3149	1402.0
540.0	0.07320	256.0	7.75	79.07	119.7	1.231	0.1863	0.3119	1410.0
550.0	0.07481	261.0	7.51	81.28	122.8	1.237	0.1860	0.3091	1419.0
560.0	0.07642	266.0	7.29	83.47	125.9	1.242	0.1857	0.3065	1427.0
570.0	0.07801	271.0	7.08	85.63	129.0	1.248	0.1855	0.3041	1435.0
580.0	0.07959	276.0	6.86	87.78	132.0	1.253	0.1853	0.3018	1444.0
590.0	0.08116	281.0	6.69	89.92	135.0	1.258	0.1851	0.2997	1452.0
600.0	0.08273	286.0	6.51	92.04	138.0	1.263	0.1849	0.2977	1461.0
700.0	0.09791	334.0	5.17	112.6	167.0	1.306	0.1840	0.2835	1545.0
800.0	0.1125	381.0	4.31	132.4	194.9	1.345	0.1842	0.2758	1625.0
900.0	0.1266	425.0	3.71	151.9	222.3	1.377	0.1852	0.2718	1701.0
1000.0	0.1405	469.0	3.26	171.3	249.3	1.406	0.1870	0.2700	1771.0
1500.0	0.2074	675.0	2.06	270.0	385.3	1.516	0.2007	0.2760	2074.0
2000.0	0.2724	873.0	1.52	374.6	526.0	1.597	0.2139	0.2867	2328.0
2500.0	0.3368	1070.0	1.21	484.4	671.5	1.662	0.2235	0.2952	2555.0
3000.0	0.4009	1260.0	1.00	598.0	820.7	1.716	0.2301	0.3013	2764.0
3500.0	0.4648	1450.0	0.858	714.3	972.5	1.763	0.2347	0.3056	2959.0

* TWO-PHASE BOUNDARY

3000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
125.0	54.42	245.0	12.1	107000.0	0.00184	0.0964	22.1	0.00393	1.46327	3.72
130.0	53.91	233.0	11.8	95400.0	0.00193	0.0939	19.3	0.00387	1.46436	3.33
135.0	53.37	222.0	11.5	86000.0	0.00203	0.0915	16.9	0.00381	1.45926	3.00
140.0	52.82	212.0	11.3	78100.0	0.00212	0.0890	15.1	0.00375	1.45399	2.75
145.0	52.26	204.0	11.1	71300.0	0.00220	0.0866	13.7	0.00369	1.44856	2.56
150.0	51.67	196.0	10.9	65400.0	0.00228	0.0841	12.7	0.00364	1.44300	2.43
155.0	51.08	190.0	10.7	60200.0	0.00235	0.0817	11.9	0.00358	1.43733	2.34
160.0	50.47	184.0	10.5	55600.0	0.00243	0.0793	11.1	0.00352	1.43156	2.25
165.0	49.86	179.0	10.3	51500.0	0.00249	0.0770	10.2	0.00345	1.42571	2.13
170.0	49.23	175.0	10.0	47700.0	0.00256	0.0747	9.62	0.00339	1.41978	2.07
175.0	48.60	171.0	9.79	44300.0	0.00263	0.0724	9.06	0.00333	1.41379	2.02
180.0	47.95	167.0	9.55	41100.0	0.00269	0.0702	8.54	0.00326	1.40774	1.96
185.0	47.30	163.0	9.31	38100.0	0.00276	0.0681	8.06	0.00320	1.40164	1.92
190.0	46.65	159.0	9.06	35400.0	0.00283	0.0660	7.60	0.00314	1.39548	1.87
200.0	45.31	153.0	8.58	30500.0	0.00297	0.0620	6.78	0.00302	1.38303	1.79
205.0	44.64	149.0	8.35	28400.0	0.00304	0.0601	6.41	0.00296	1.37673	1.75
210.0	43.96	146.0	8.12	26300.0	0.00312	0.0582	6.06	0.00290	1.37039	1.71
215.0	43.27	143.0	7.89	24400.0	0.00320	0.0564	5.73	0.00285	1.36401	1.67
220.0	42.57	140.0	7.67	22700.0	0.00329	0.0547	5.42	0.00279	1.35760	1.64
225.0	41.87	138.0	7.46	21000.0	0.00336	0.0530	5.13	0.00274	1.35114	1.61
230.0	41.17	135.0	7.25	19500.0	0.00344	0.0513	4.85	0.00269	1.34466	1.58
235.0	40.46	132.0	7.05	18100.0	0.00352	0.0498	4.60	0.00265	1.33815	1.55
240.0	39.74	129.0	6.86	16800.0	0.00361	0.0482	4.36	0.00260	1.33162	1.52
245.0	39.02	127.0	6.67	15600.0	0.00369	0.0468	4.13	0.00256	1.32507	1.49
250.0	38.30	124.0	6.49	14500.0	0.00378	0.0454	3.92	0.00252	1.31851	1.46
255.0	37.57	122.0	6.32	13400.0	0.00387	0.0440	3.72	0.00249	1.31194	1.43
260.0	36.85	119.0	6.15	12500.0	0.00395	0.0427	3.53	0.00246	1.30537	1.40
265.0	36.12	117.0	5.98	11600.0	0.00404	0.0415	3.35	0.00243	1.29881	1.37
270.0	35.39	115.0	5.83	10800.0	0.00412	0.0403	3.18	0.00241	1.29227	1.35
275.0	34.66	113.0	5.68	10000.0	0.00419	0.0392	3.03	0.00239	1.28576	1.32
280.0	33.94	111.0	5.53	9370.0	0.00427	0.0381	2.88	0.00237	1.27928	1.29
285.0	33.21	109.0	5.39	8760.0	0.00434	0.0371	2.75	0.00236	1.27286	1.26
290.0	32.50	108.0	5.26	8210.0	0.00440	0.0360	2.62	0.00234	1.26650	1.24
295.0	31.79	106.0	5.13	7710.0	0.00445	0.0351	2.51	0.00234	1.26022	1.22
300.0	31.08	105.0	5.01	7260.0	0.00449	0.0341	2.40	0.00233	1.25403	1.19
310.0	29.71	103.0	4.79	6500.0	0.00454	0.0323	2.21	0.00233	1.24199	1.15
320.0	28.39	101.0	4.59	5890.0	0.00455	0.0303	2.05	0.00236	1.23047	1.11
330.0	27.13	100.0	4.42	5410.0	0.00451	0.0294	1.92	0.00239	1.21956	1.07
340.0	25.94	100.0	4.26	5030.0	0.00444	0.0282	1.82	0.00245	1.20931	1.03
350.0	24.83	100.0	4.13	4740.0	0.00434	0.0272	1.74	0.00252	1.19974	1.00
360.0	23.79	100.0	4.01	4500.0	0.00422	0.0263	1.67	0.00261	1.19086	0.968
370.0	22.82	101.0	3.90	4310.0	0.00409	0.0256	1.62	0.00271	1.18265	0.942
380.0	21.92	103.0	3.81	4160.0	0.00394	0.0250	1.58	0.00282	1.17506	0.919
390.0	21.09	104.0	3.72	4040.0	0.00380	0.0244	1.55	0.00293	1.16805	0.899
400.0	20.32	106.0	3.65	3950.0	0.00365	0.0240	1.52	0.00306	1.16159	0.881
410.0	19.60	108.0	3.58	3870.0	0.00351	0.0236	1.50	0.00319	1.15561	0.866
420.0	18.94	110.0	3.52	3800.0	0.00337	0.0233	1.49	0.00333	1.15009	0.852
430.0	18.32	112.0	3.46	3750.0	0.00324	0.0230	1.48	0.00347	1.14498	0.840
440.0	17.75	114.0	3.41	3700.0	0.00312	0.0228	1.48	0.00361	1.14023	0.830
450.0	17.22	117.0	3.36	3670.0	0.00300	0.0226	1.47	0.00376	1.13582	0.821
460.0	16.72	119.0	3.31	3640.0	0.00289	0.0225	1.47	0.00391	1.13171	0.812
470.0	16.25	122.0	3.27	3610.0	0.00278	0.0224	1.48	0.00406	1.12787	0.805
480.0	15.81	124.0	3.23	3590.0	0.00269	0.0223	1.48	0.00422	1.12427	0.798
490.0	15.40	127.0	3.20	3570.0	0.00259	0.0222	1.48	0.00438	1.12090	0.792
500.0	15.01	130.0	3.16	3550.0	0.00251	0.0222	1.49	0.00454	1.11774	0.787
510.0	14.65	132.0	3.13	3540.0	0.00243	0.0222	1.50	0.00470	1.11476	0.782
520.0	14.30	135.0	3.10	3520.0	0.00235	0.0221	1.50	0.00487	1.11194	0.777
530.0	13.97	138.0	3.07	3510.0	0.00228	0.0221	1.51	0.00503	1.10929	0.773
540.0	13.66	141.0	3.05	3500.0	0.00221	0.0222	1.52	0.00520	1.10677	0.770
550.0	13.37	144.0	3.02	3490.0	0.00215	0.0222	1.53	0.00537	1.10438	0.766
560.0	13.09	147.0	3.00	3480.0	0.00209	0.0222	1.54	0.00554	1.10212	0.763
570.0	12.82	149.0	2.98	3480.0	0.00203	0.0223	1.55	0.00571	1.09996	0.760
580.0	12.56	152.0	2.95	3470.0	0.00198	0.0223	1.56	0.00589	1.09791	0.758
590.0	12.32	155.0	2.93	3460.0	0.00193	0.0224	1.57	0.00606	1.09595	0.755
600.0	12.09	158.0	2.91	3460.0	0.00188	0.0224	1.58	0.00624	1.09408	0.753
700.0	10.21	187.0	2.75	3410.0	0.00152	0.0234	1.69	0.00808	1.07909	0.737
800.0	8.890	216.0	2.63	3380.0	0.00127	0.0246	1.81	0.0101	1.06859	0.728
900.0	7.896	246.0	2.54	3360.0	0.00110	0.0261	1.92	0.0121	1.06076	0.722
1000.0	7.118	275.0	2.45	3340.0	0.000978	0.0276	2.04	0.0143	1.05465	0.719
1500.0	4.822	436.0	2.13	3260.0	0.000633					
2000.0	3.670	604.0	1.94	3200.0	0.000474					
2500.0	2.969	775.0	1.82	3170.0	0.000331					
3000.0	2.494	944.0	1.75	3140.0	0.000319					
3500.0	2.151	1110.0	1.70	3120.0	0.000275					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

4000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	DU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
125.0	0.01821	2140.0	192.0	-62.61	-49.12	0.5967	0.3084	0.4410	3768.0
130.0	0.01837	1940.0	183.0	-60.52	-46.92	0.6140	0.3015	0.4409	3630.0
135.0	0.01853	1780.0	174.0	-58.44	-44.71	0.6306	0.2936	0.4400	3516.0
140.0	0.01870	1640.0	167.0	-56.37	-42.52	0.6466	0.2857	0.4391	3419.0
145.0	0.01889	1520.0	160.0	-54.31	-40.32	0.6620	0.2782	0.4382	3334.0
150.0	0.01908	1420.0	153.0	-52.27	-38.14	0.6768	0.2715	0.4374	3258.0
155.0	0.01928	1330.0	146.0	-50.23	-35.95	0.6912	0.2655	0.4369	3188.0
160.0	0.01948	1250.0	140.0	-48.20	-33.77	0.7050	0.2602	0.4365	3122.0
165.0	0.01970	1180.0	134.0	-46.18	-31.58	0.7185	0.2557	0.4363	3059.0
170.0	0.01992	1120.0	129.0	-44.16	-29.40	0.7315	0.2517	0.4362	2998.0
175.0	0.02016	1060.0	123.0	-42.15	-27.22	0.7441	0.2482	0.4362	2939.0
180.0	0.02040	1010.0	118.0	-40.15	-25.04	0.7564	0.2452	0.4364	2881.0
185.0	0.02064	956.0	113.0	-38.15	-22.86	0.7684	0.2425	0.4367	2824.0
190.0	0.02090	909.0	108.0	-36.15	-20.67	0.7800	0.2402	0.4371	2768.0
200.0	0.02143	823.0	98.8	-32.17	-16.30	0.8025	0.2361	0.4381	2660.0
205.0	0.02171	783.0	94.6	-30.19	-14.11	0.8133	0.2343	0.4386	2607.0
210.0	0.02200	746.0	90.5	-28.21	-11.91	0.8239	0.2326	0.4391	2555.0
215.0	0.02230	712.0	86.6	-26.23	-9.724	0.8342	0.2310	0.4397	2505.0
220.0	0.02261	679.0	82.8	-24.26	-7.524	0.8443	0.2295	0.4402	2455.0
225.0	0.02293	648.0	79.3	-22.29	-5.322	0.8542	0.2281	0.4406	2407.0
230.0	0.02325	618.0	75.9	-20.33	-3.118	0.8639	0.2267	0.4410	2361.0
235.0	0.02359	591.0	72.6	-18.38	-0.9134	0.8734	0.2254	0.4413	2315.0
240.0	0.02394	565.0	69.5	-16.43	1.294	0.8827	0.2241	0.4415	2271.0
245.0	0.02429	541.0	66.5	-14.48	3.502	0.8918	0.2229	0.4417	2228.0
250.0	0.02466	518.0	63.6	-12.55	5.710	0.9007	0.2216	0.4417	2187.0
255.0	0.02504	496.0	60.9	-10.62	7.918	0.9095	0.2204	0.4416	2146.0
260.0	0.02543	476.0	58.3	-8.710	10.13	0.9180	0.2193	0.4415	2108.0
265.0	0.02583	457.0	55.8	-6.801	12.33	0.9264	0.2181	0.4412	2070.0
270.0	0.02625	440.0	53.4	-4.902	14.54	0.9347	0.2170	0.4407	2034.0
275.0	0.02667	423.0	51.2	-3.014	16.74	0.9428	0.2159	0.4402	1999.0
280.0	0.02711	408.0	49.0	-1.137	18.94	0.9507	0.2148	0.4395	1966.0
285.0	0.02755	393.0	47.0	0.7260	21.14	0.9585	0.2138	0.4387	1934.0
290.0	0.02801	380.0	45.0	2.577	23.33	0.9661	0.2127	0.4378	1903.0
295.0	0.02848	368.0	43.2	4.414	25.51	0.9736	0.2117	0.4366	1874.0
300.0	0.02897	356.0	41.4	6.237	27.69	0.9809	0.2108	0.4354	1846.0
310.0	0.02996	336.0	38.2	9.837	32.03	0.995	0.2089	0.4323	1795.0
320.0	0.03100	319.0	35.2	13.37	36.34	1.009	0.2071	0.4286	1749.0
330.0	0.03209	305.0	32.6	16.84	40.60	1.022	0.2055	0.4243	1708.0
340.0	0.03320	293.0	30.2	20.23	44.82	1.035	0.2039	0.4194	1672.0
350.0	0.03435	284.0	28.0	23.54	48.99	1.047	0.2025	0.4140	1641.0
360.0	0.03553	277.0	26.1	26.78	53.10	1.058	0.2011	0.4082	1615.0
370.0	0.03673	272.0	24.4	29.95	57.15	1.069	0.1999	0.4022	1593.0
380.0	0.03795	268.0	22.9	33.03	61.14	1.080	0.1987	0.3960	1575.0
390.0	0.03919	266.0	21.5	36.05	65.07	1.090	0.1976	0.3899	1560.0
400.0	0.04042	265.0	20.2	39.00	68.94	1.100	0.1966	0.3838	1547.0
410.0	0.04168	264.0	19.1	41.88	72.75	1.109	0.1956	0.3778	1538.0
420.0	0.04293	265.0	18.1	44.69	76.50	1.118	0.1947	0.3719	1530.0
430.0	0.04420	266.0	17.2	47.45	80.19	1.127	0.1939	0.3663	1525.0
440.0	0.04545	267.0	16.3	50.15	83.82	1.135	0.1932	0.3610	1521.0
450.0	0.04672	269.0	15.6	52.80	87.41	1.143	0.1925	0.3559	1519.0
460.0	0.04798	272.0	14.9	55.40	90.94	1.151	0.1919	0.3510	1518.0
470.0	0.04923	275.0	14.2	57.96	94.43	1.159	0.1913	0.3464	1518.0
480.0	0.05049	278.0	13.6	60.47	97.87	1.166	0.1907	0.3420	1519.0
490.0	0.05173	281.0	13.1	62.95	101.3	1.173	0.1902	0.3379	1521.0
500.0	0.05298	285.0	12.6	65.39	104.6	1.180	0.1898	0.3340	1523.0
510.0	0.05421	288.0	12.1	67.79	108.0	1.186	0.1893	0.3304	1527.0
520.0	0.05544	292.0	11.7	70.17	111.2	1.193	0.1889	0.3270	1530.0
530.0	0.05667	296.0	11.3	72.51	114.5	1.199	0.1886	0.3237	1535.0
540.0	0.05783	300.0	10.9	74.83	117.7	1.205	0.1882	0.3207	1539.0
550.0	0.05910	304.0	10.5	77.13	120.9	1.211	0.1879	0.3178	1545.0
560.0	0.06031	309.0	10.2	79.40	124.1	1.217	0.1876	0.3151	1550.0
570.0	0.06151	313.0	9.91	81.65	127.2	1.222	0.1874	0.3126	1556.0
580.0	0.06270	317.0	9.62	83.88	130.3	1.227	0.1871	0.3102	1561.0
590.0	0.06389	322.0	9.35	86.09	133.4	1.233	0.1869	0.3080	1567.0
600.0	0.06507	326.0	9.09	88.28	136.5	1.238	0.1867	0.3059	1574.0
700.0	0.07661	372.0	7.15	109.5	166.2	1.284	0.1855	0.2902	1641.0
800.0	0.08770	417.0	5.92	129.8	194.7	1.322	0.1854	0.2812	1712.0
900.0	0.09848	462.0	5.07	149.6	222.6	1.355	0.1863	0.2762	1780.0
1000.0	0.1090	505.0	4.44	169.3	250.1	1.384	0.1880	0.2737	1846.0
1500.0	0.1596	713.0	2.77	269.0	387.2	1.495	0.2013	0.2777	2134.0
2000.0	0.2087	911.0	2.03	374.0	528.6	1.576	0.2143	0.2876	2379.0
2500.0	0.2571	1100.0	1.61	484.1	674.5	1.641	0.2238	0.2957	2601.0
3000.0	0.3052	1300.0	1.34	597.9	823.9	1.696	0.2303	0.3016	2806.0
3500.0	0.3531	1490.0	1.14	714.3	975.8	1.742	0.2349	0.3058	2997.0

* TWO-PHASE BOUNDARY

4000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
125.0	54.30	270.0	11.4	118000.0	0.00164	0.0989	25.6	0.00408	1.47396	4.11
130.0	54.44	255.0	11.1	106000.0	0.00173	0.0967	22.3	0.00403	1.46954	3.67
135.0	53.96	243.0	11.0	96100.0	0.00181	0.0944	19.6	0.00398	1.46492	3.29
140.0	53.47	231.0	10.9	87800.0	0.00190	0.0921	17.3	0.00392	1.46014	2.97
145.0	52.95	222.0	10.8	80700.0	0.00198	0.0898	15.5	0.00387	1.45519	2.72
150.0	52.42	213.0	10.7	74500.0	0.00205	0.0875	14.1	0.00381	1.45012	2.54
155.0	51.88	206.0	10.6	69100.0	0.00212	0.0852	13.0	0.00376	1.44493	2.41
160.0	51.32	200.0	10.5	64400.0	0.00218	0.0829	12.2	0.00370	1.43964	2.31
165.0	50.76	195.0	10.3	60100.0	0.00223	0.0806	11.5	0.00364	1.43429	2.23
170.0	50.19	191.0	10.2	56200.0	0.00223	0.0784	10.7	0.00358	1.42886	2.14
175.0	49.61	187.0	10.0	52600.0	0.00234	0.0763	10.0	0.00353	1.42339	2.06
180.0	49.03	183.0	9.80	49300.0	0.00233	0.0742	9.46	0.00347	1.41788	2.00
185.0	48.44	179.0	9.60	46300.0	0.00244	0.0721	8.96	0.00341	1.41234	1.95
190.0	47.85	176.0	9.39	43500.0	0.00248	0.0702	8.49	0.00335	1.40676	1.90
200.0	46.65	170.0	8.97	38400.0	0.00257	0.0663	7.63	0.00325	1.39555	1.81
205.0	46.05	167.0	8.77	36100.0	0.00262	0.0645	7.25	0.00319	1.38991	1.77
210.0	45.45	165.0	8.56	33900.0	0.00267	0.0627	6.88	0.00314	1.38426	1.73
215.0	44.84	162.0	8.36	31900.0	0.00271	0.0610	6.54	0.00309	1.37861	1.70
220.0	44.23	159.0	8.16	30000.0	0.00276	0.0593	6.22	0.00305	1.37294	1.66
225.0	43.62	157.0	7.97	28200.0	0.00281	0.0577	5.92	0.00300	1.36727	1.63
230.0	43.01	155.0	7.78	26600.0	0.00285	0.0562	5.64	0.00296	1.36160	1.59
235.0	42.39	152.0	7.60	25000.0	0.00290	0.0546	5.37	0.00292	1.35594	1.56
240.0	41.78	150.0	7.42	23600.0	0.00294	0.0532	5.12	0.00288	1.35028	1.53
245.0	41.16	148.0	7.25	22300.0	0.00299	0.0518	4.89	0.00285	1.34463	1.50
250.0	40.55	146.0	7.08	21000.0	0.00303	0.0504	4.67	0.00281	1.33900	1.47
255.0	39.94	144.0	6.92	19800.0	0.00307	0.0491	4.46	0.00278	1.33339	1.44
260.0	39.32	142.0	6.76	18700.0	0.00311	0.0479	4.26	0.00276	1.32780	1.42
265.0	38.71	140.0	6.61	17700.0	0.00315	0.0466	4.08	0.00273	1.32224	1.39
270.0	38.10	138.0	6.46	16800.0	0.00319	0.0455	3.90	0.00271	1.31671	1.36
275.0	37.50	136.0	6.32	15900.0	0.00323	0.0444	3.74	0.00269	1.31122	1.34
280.0	36.89	135.0	6.19	15000.0	0.00326	0.0433	3.59	0.00267	1.30578	1.31
285.0	36.29	133.0	6.06	14300.0	0.00329	0.0423	3.44	0.00266	1.30038	1.28
290.0	35.70	132.0	5.93	13600.0	0.00332	0.0413	3.30	0.00264	1.29503	1.26
295.0	35.11	130.0	5.81	12900.0	0.00335	0.0404	3.17	0.00263	1.28974	1.24
300.0	34.52	129.0	5.69	12300.0	0.00337	0.0395	3.05	0.00263	1.28452	1.21
310.0	33.37	127.0	5.47	11200.0	0.00340	0.0378	2.84	0.00262	1.27427	1.17
320.0	32.25	125.0	5.27	10300.0	0.00342	0.0362	2.65	0.00262	1.26434	1.13
330.0	31.17	124.0	5.08	9500.0	0.00343	0.0348	2.48	0.00263	1.25476	1.09
340.0	30.12	123.0	4.91	8840.0	0.00341	0.0335	2.34	0.00265	1.24555	1.05
350.0	29.11	122.0	4.76	8280.0	0.00339	0.0324	2.21	0.00269	1.23675	1.02
360.0	28.15	122.0	4.62	7810.0	0.00335	0.0314	2.11	0.00273	1.22836	0.988
370.0	27.23	122.0	4.49	7410.0	0.00329	0.0305	2.02	0.00278	1.22039	0.960
380.0	26.35	123.0	4.37	7070.0	0.00323	0.0297	1.95	0.00284	1.21284	0.934
390.0	25.52	123.0	4.26	6790.0	0.00316	0.0290	1.88	0.00291	1.20571	0.912
400.0	24.74	124.0	4.16	6550.0	0.00309	0.0284	1.83	0.00299	1.19898	0.892
410.0	23.99	125.0	4.07	6340.0	0.00301	0.0278	1.79	0.00307	1.19264	0.874
420.0	23.29	127.0	3.99	6160.0	0.00293	0.0273	1.75	0.00315	1.18666	0.858
430.0	22.63	128.0	3.91	6010.0	0.00285	0.0269	1.72	0.00325	1.18102	0.845
440.0	22.00	130.0	3.84	5880.0	0.00278	0.0265	1.70	0.00334	1.17571	0.832
450.0	21.40	132.0	3.77	5760.0	0.00270	0.0262	1.68	0.00344	1.17071	0.822
460.0	20.84	134.0	3.71	5660.0	0.00262	0.0259	1.67	0.00355	1.16599	0.812
470.0	20.31	136.0	3.66	5580.0	0.00255	0.0257	1.66	0.00365	1.16153	0.804
480.0	19.81	138.0	3.60	5500.0	0.00248	0.0255	1.65	0.00376	1.15732	0.796
490.0	19.33	140.0	3.56	5430.0	0.00241	0.0253	1.64	0.00387	1.15333	0.789
500.0	18.88	143.0	3.51	5370.0	0.00234	0.0252	1.64	0.00399	1.14956	0.783
510.0	18.45	145.0	3.47	5320.0	0.00228	0.0250	1.64	0.00411	1.14599	0.778
520.0	18.04	148.0	3.42	5270.0	0.00221	0.0249	1.64	0.00423	1.14259	0.773
530.0	17.65	150.0	3.39	5230.0	0.00216	0.0248	1.64	0.00435	1.13937	0.769
540.0	17.27	153.0	3.35	5190.0	0.00210	0.0243	1.64	0.00447	1.13630	0.765
550.0	16.92	155.0	3.32	5150.0	0.00205	0.0247	1.64	0.00460	1.13338	0.761
560.0	16.58	158.0	3.28	5120.0	0.00200	0.0247	1.65	0.00472	1.13059	0.758
570.0	16.26	161.0	3.25	5090.0	0.00195	0.0247	1.65	0.00485	1.12794	0.755
580.0	15.95	163.0	3.22	5060.0	0.00190	0.0246	1.66	0.00498	1.12540	0.752
590.0	15.65	166.0	3.19	5040.0	0.00186	0.0246	1.67	0.00511	1.12297	0.750
600.0	15.37	169.0	3.17	5010.0	0.00181	0.0247	1.67	0.00525	1.12064	0.747
700.0	13.05	197.0	2.95	4850.0	0.00147	0.0252	1.76	0.00664	1.10185	0.732
800.0	11.40	226.0	2.80	4760.0	0.00125	0.0261	1.87	0.00815	1.08857	0.724
900.0	10.15	256.0	2.68	4690.0	0.00108	0.0273	1.98	0.00974	1.07862	0.719
1000.0	9.173	286.0	2.57	4630.0	0.000957	0.0287	2.09	0.0114	1.07083	0.716
1500.0	6.264	447.0	2.20	4460.0	0.000621					
2000.0	4.792	617.0	1.98	4360.0	0.000466					
2500.0	3.890	788.0	1.85	4300.0	0.000375					
3000.0	3.277	959.0	1.77	4250.0	0.000315					
3500.0	2.832	1130.0	1.72	4220.0	0.000271					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

5000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
130.0	0.01820	2120.0	180.0	-61.10	-44.25	0.6085	0.3096	0.4319	3701.0
135.0	0.01835	1950.0	174.0	-59.08	-42.09	0.6247	0.3007	0.4308	3596.0
140.0	0.01850	1800.0	167.0	-57.07	-39.94	0.6404	0.2920	0.4297	3508.0
145.0	0.01867	1660.0	161.0	-55.08	-37.80	0.6554	0.2838	0.4289	3431.0
150.0	0.01884	1580.0	156.0	-53.09	-35.65	0.6700	0.2765	0.4283	3363.0
155.0	0.01902	1480.0	150.0	-51.12	-33.51	0.6840	0.2700	0.4279	3300.0
160.0	0.01920	1400.0	145.0	-49.15	-31.37	0.6976	0.2644	0.4276	3242.0
165.0	0.01940	1330.0	139.0	-47.20	-29.24	0.7107	0.2594	0.4274	3186.0
170.0	0.01960	1260.0	134.0	-45.25	-27.10	0.7235	0.2552	0.4273	3132.0
175.0	0.01980	1200.0	129.0	-43.30	-24.96	0.7359	0.2515	0.4272	3079.0
180.0	0.02002	1150.0	124.0	-41.36	-22.83	0.7479	0.2482	0.4272	3028.0
185.0	0.02024	1100.0	119.0	-39.43	-20.69	0.7596	0.2453	0.4272	2977.0
190.0	0.02046	1050.0	115.0	-37.50	-18.56	0.7710	0.2428	0.4273	2927.0
200.0	0.02093	964.0	106.0	-33.66	-14.28	0.7929	0.2385	0.4274	2829.0
205.0	0.02118	924.0	102.0	-31.75	-12.15	0.8035	0.2366	0.4274	2782.0
210.0	0.02143	887.0	97.8	-29.85	-10.01	0.8138	0.2348	0.4274	2735.0
215.0	0.02169	851.0	94.0	-27.95	-7.881	0.8238	0.2332	0.4274	2689.0
220.0	0.02194	818.0	90.3	-26.05	-5.744	0.8337	0.2317	0.4273	2644.0
225.0	0.02221	786.0	86.8	-24.17	-3.607	0.8433	0.2302	0.4272	2600.0
230.0	0.02243	756.0	83.4	-22.28	-1.471	0.8527	0.2288	0.4271	2557.0
235.0	0.02277	727.0	80.2	-20.41	0.6623	0.8618	0.2274	0.4268	2515.0
240.0	0.02306	700.0	77.1	-18.55	2.796	0.8708	0.2261	0.4265	2474.0
245.0	0.02336	675.0	74.1	-16.69	4.927	0.8796	0.2249	0.4261	2434.0
250.0	0.02366	651.0	71.2	-14.84	7.057	0.8882	0.2236	0.4256	2396.0
255.0	0.02397	628.0	68.5	-13.00	9.184	0.8966	0.2225	0.4251	2359.0
260.0	0.02423	607.0	65.9	-11.17	11.31	0.9049	0.2213	0.4244	2322.0
265.0	0.02461	587.0	63.4	-9.357	13.43	0.9130	0.2201	0.4237	2288.0
270.0	0.02494	568.0	61.0	-7.547	15.54	0.9209	0.2190	0.4228	2254.0
275.0	0.02528	550.0	58.7	-5.748	17.66	0.9286	0.2179	0.4219	2221.0
280.0	0.02562	533.0	56.5	-3.960	19.76	0.9362	0.2169	0.4209	2190.0
285.0	0.02597	518.0	54.5	-2.183	21.86	0.9437	0.2158	0.4198	2160.0
290.0	0.02633	503.0	52.5	-0.4194	23.96	0.9510	0.2148	0.4187	2131.0
295.0	0.02670	489.0	50.6	1.333	26.05	0.9581	0.2138	0.4174	2103.0
300.0	0.02707	476.0	48.7	3.072	28.14	0.9651	0.2129	0.4161	2076.0
310.0	0.02783	452.0	45.3	6.512	32.28	0.9787	0.2110	0.4132	2026.0
320.0	0.02862	432.0	42.3	9.897	36.40	0.9918	0.2093	0.4100	1980.0
330.0	0.02944	414.0	39.4	13.23	40.48	1.004	0.2076	0.4066	1938.0
340.0	0.03027	399.0	36.9	16.50	44.53	1.016	0.2061	0.4028	1900.0
350.0	0.03113	385.0	34.5	19.71	48.54	1.028	0.2046	0.3989	1866.0
360.0	0.03201	375.0	32.4	22.87	52.51	1.039	0.2032	0.3947	1836.0
370.0	0.03290	365.0	30.5	25.97	56.43	1.050	0.2020	0.3904	1809.0
380.0	0.03381	358.0	28.7	29.01	60.31	1.060	0.2008	0.3860	1785.0
390.0	0.03474	352.0	27.1	31.99	64.15	1.070	0.1997	0.3815	1765.0
400.0	0.03567	347.0	25.6	34.92	67.94	1.080	0.1987	0.3770	1747.0
410.0	0.03661	344.0	24.3	37.79	71.69	1.089	0.1977	0.3725	1732.0
420.0	0.03757	341.0	23.1	40.61	75.39	1.098	0.1968	0.3681	1719.0
430.0	0.03852	339.0	21.9	43.38	79.05	1.107	0.1960	0.3637	1708.0
440.0	0.03949	338.0	20.9	46.11	82.67	1.115	0.1953	0.3595	1699.0
450.0	0.04045	338.0	20.0	48.79	86.24	1.123	0.1946	0.3554	1691.0
460.0	0.04142	338.0	19.1	51.43	89.78	1.131	0.1939	0.3514	1685.0
470.0	0.04239	339.0	18.3	54.03	93.27	1.138	0.1933	0.3476	1680.0
480.0	0.04336	340.0	17.5	56.58	96.73	1.146	0.1927	0.3439	1677.0
490.0	0.04433	342.0	16.9	59.11	100.2	1.153	0.1922	0.3404	1675.0
500.0	0.04530	344.0	16.2	61.60	103.5	1.159	0.1917	0.3370	1673.0
510.0	0.04628	346.0	15.6	64.06	106.9	1.166	0.1912	0.3338	1672.0
520.0	0.04723	348.0	15.1	66.49	110.2	1.173	0.1908	0.3307	1673.0
530.0	0.04819	351.0	14.5	68.89	113.5	1.179	0.1904	0.3278	1673.0
540.0	0.04915	354.0	14.1	71.26	116.8	1.185	0.1900	0.3250	1675.0
550.0	0.05011	357.0	13.6	73.61	120.0	1.191	0.1897	0.3223	1677.0
560.0	0.05107	360.0	13.2	75.93	123.2	1.197	0.1894	0.3198	1679.0
570.0	0.05202	364.0	12.8	78.24	126.4	1.202	0.1891	0.3173	1682.0
580.0	0.05297	367.0	12.4	80.52	129.6	1.208	0.1888	0.3151	1685.0
590.0	0.05391	371.0	12.1	82.78	132.7	1.213	0.1886	0.3129	1689.0
600.0	0.05485	375.0	11.7	85.03	135.8	1.218	0.1883	0.3108	1693.0
700.0	0.06410	415.0	9.18	106.7	166.0	1.265	0.1868	0.2949	1743.0
800.0	0.07304	458.0	7.57	127.4	195.0	1.304	0.1866	0.2854	1802.0
900.0	0.08174	501.0	6.45	147.6	223.2	1.337	0.1874	0.2798	1862.0
1000.0	0.09023	544.0	5.63	167.5	251.1	1.366	0.1889	0.2768	1922.0
1500.0	0.1311	751.0	3.49	268.0	389.3	1.478	0.2019	0.2792	2194.0
2000.0	0.1704	950.0	2.55	373.4	531.2	1.560	0.2147	0.2884	2431.0
2500.0	0.2092	1140.0	2.02	483.7	677.5	1.625	0.2241	0.2962	2647.0
3000.0	0.2477	1340.0	1.67	597.7	827.1	1.680	0.2305	0.3019	2847.0
3500.0	0.2861	1530.0	1.43	714.2	979.1	1.727	0.2351	0.3061	3035.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

5000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
130.0	54.94	279.0	10.6	116000.0	0.00155	0.0992	25.8	0.00418	1.47428	4.05
135.0	54.50	264.0	10.6	106000.0	0.00163	0.0971	22.7	0.00414	1.47009	3.63
140.0	54.05	250.0	10.6	97500.0	0.00172	0.0950	20.0	0.00409	1.46571	3.26
145.0	53.57	239.0	10.6	90100.0	0.00179	0.0928	17.8	0.00404	1.46118	2.96
150.0	53.09	230.0	10.6	83700.0	0.00186	0.0906	16.0	0.00398	1.45651	2.72
155.0	52.59	222.0	10.6	78000.0	0.00193	0.0884	14.5	0.00393	1.45172	2.53
160.0	52.08	216.0	10.5	73000.0	0.00198	0.0862	13.4	0.00387	1.44683	2.40
165.0	51.56	210.0	10.4	68600.0	0.00203	0.0840	12.5	0.00381	1.44187	2.30
170.0	51.03	205.0	10.3	64500.0	0.00203	0.0819	11.8	0.00376	1.43684	2.22
175.0	50.49	201.0	10.2	60800.0	0.00212	0.0799	11.1	0.00370	1.43177	2.14
180.0	49.96	198.0	10.0	57400.0	0.00216	0.0778	10.4	0.00365	1.42667	2.05
185.0	49.42	194.0	9.84	54300.0	0.00220	0.0758	9.83	0.00359	1.42154	1.99
190.0	48.87	191.0	9.67	51400.0	0.00223	0.0739	9.34	0.00354	1.41639	1.94
200.0	47.76	186.0	9.30	46100.0	0.00230	0.0702	8.45	0.00344	1.40607	1.85
205.0	47.23	183.0	9.11	43700.0	0.00233	0.0684	8.05	0.00339	1.40090	1.81
210.0	46.67	181.0	8.92	41400.0	0.00236	0.0667	7.67	0.00334	1.39573	1.77
215.0	46.12	179.0	8.74	39300.0	0.00233	0.0650	7.32	0.00330	1.39057	1.73
220.0	45.57	176.0	8.55	37300.0	0.00242	0.0634	6.98	0.00326	1.38541	1.69
225.0	45.02	174.0	8.37	35400.0	0.00245	0.0618	6.67	0.00322	1.38026	1.66
230.0	44.47	172.0	8.20	33600.0	0.00248	0.0603	6.37	0.00318	1.37513	1.62
235.0	43.91	170.0	8.03	31900.0	0.00251	0.0589	6.09	0.00314	1.37001	1.59
240.0	43.36	168.0	7.86	30400.0	0.00254	0.0574	5.83	0.00311	1.36491	1.56
245.0	42.81	166.0	7.69	28900.0	0.00255	0.0561	5.53	0.00307	1.35983	1.53
250.0	42.27	164.0	7.54	27500.0	0.00259	0.0547	5.35	0.00304	1.35477	1.50
255.0	41.72	163.0	7.38	26200.0	0.00261	0.0535	5.14	0.00301	1.34974	1.47
260.0	41.18	161.0	7.23	25000.0	0.00264	0.0522	4.93	0.00299	1.34475	1.44
265.0	40.63	159.0	7.09	23800.0	0.00266	0.0511	4.73	0.00297	1.33978	1.41
270.0	40.10	158.0	6.95	22800.0	0.00268	0.0499	4.55	0.00294	1.33486	1.39
275.0	39.56	156.0	6.81	21800.0	0.00270	0.0488	4.38	0.00292	1.32997	1.36
280.0	39.03	155.0	6.68	20800.0	0.00272	0.0478	4.21	0.00291	1.32513	1.34
285.0	38.50	154.0	6.55	19900.0	0.00273	0.0467	4.06	0.00289	1.32033	1.31
290.0	37.98	152.0	6.43	19100.0	0.00275	0.0458	3.91	0.00288	1.31557	1.29
295.0	37.46	151.0	6.31	18300.0	0.00276	0.0448	3.77	0.00287	1.31087	1.26
300.0	36.94	150.0	6.20	17600.0	0.00277	0.0439	3.64	0.00286	1.30623	1.24
310.0	35.93	148.0	5.98	16200.0	0.00273	0.0422	3.40	0.00285	1.29710	1.20
320.0	34.94	146.0	5.78	15100.0	0.00280	0.0407	3.19	0.00284	1.28822	1.16
330.0	33.97	145.0	5.59	14100.0	0.00283	0.0392	3.00	0.00284	1.27959	1.12
340.0	33.03	144.0	5.42	13200.0	0.00280	0.0379	2.83	0.00285	1.27124	1.08
350.0	32.12	143.0	5.25	12400.0	0.00273	0.0367	2.69	0.00287	1.26318	1.05
360.0	31.24	143.0	5.10	11700.0	0.00277	0.0357	2.55	0.00289	1.25542	1.02
370.0	30.39	142.0	4.96	11100.0	0.00274	0.0347	2.44	0.00292	1.24795	0.989
380.0	29.57	142.0	4.83	10600.0	0.00271	0.0338	2.34	0.00296	1.24079	0.962
390.0	28.79	143.0	4.71	10100.0	0.00267	0.0330	2.25	0.00300	1.23393	0.938
400.0	28.03	143.0	4.60	9730.0	0.00263	0.0322	2.18	0.00305	1.22738	0.916
410.0	27.31	144.0	4.50	9380.0	0.00259	0.0316	2.11	0.00311	1.22112	0.896
420.0	26.62	145.0	4.40	9083.0	0.00254	0.0310	2.05	0.00316	1.21514	0.878
430.0	25.96	146.0	4.31	8800.0	0.00243	0.0305	2.00	0.00323	1.20945	0.861
440.0	25.33	147.0	4.23	8570.0	0.00244	0.0300	1.96	0.00329	1.20402	0.847
450.0	24.72	149.0	4.15	8350.0	0.00233	0.0296	1.93	0.00337	1.19884	0.834
460.0	24.14	150.0	4.08	8160.0	0.00234	0.0292	1.90	0.00344	1.19391	0.822
470.0	23.59	152.0	4.01	8000.0	0.00229	0.0288	1.87	0.00352	1.18921	0.811
480.0	23.06	154.0	3.95	7840.0	0.00224	0.0285	1.85	0.00360	1.18473	0.802
490.0	22.56	156.0	3.89	7710.0	0.00219	0.0283	1.83	0.00368	1.18046	0.794
500.0	22.08	158.0	3.83	7590.0	0.00214	0.0280	1.82	0.00377	1.17638	0.786
510.0	21.62	160.0	3.78	7480.0	0.00209	0.0278	1.81	0.00386	1.17249	0.780
520.0	21.17	162.0	3.73	7380.0	0.00204	0.0276	1.80	0.00395	1.16877	0.774
530.0	20.75	164.0	3.68	7290.0	0.00200	0.0275	1.79	0.00404	1.16521	0.768
540.0	20.34	166.0	3.64	7200.0	0.00195	0.0273	1.78	0.00413	1.16181	0.763
550.0	19.96	169.0	3.59	7130.0	0.00191	0.0272	1.78	0.00423	1.15856	0.759
560.0	19.58	171.0	3.55	7060.0	0.00187	0.0271	1.78	0.00433	1.15544	0.755
570.0	19.22	174.0	3.52	6990.0	0.00183	0.0270	1.78	0.00443	1.15246	0.752
580.0	18.88	176.0	3.48	6940.0	0.00179	0.0269	1.78	0.00453	1.14959	0.748
590.0	18.55	179.0	3.45	6880.0	0.00175	0.0269	1.78	0.00463	1.14684	0.746
600.0	18.23	181.0	3.41	6830.0	0.00172	0.0268	1.78	0.00474	1.14420	0.743
700.0	15.60	208.0	3.15	6480.0	0.00142	0.0269	1.84	0.00585	1.12255	0.726
800.0	13.69	237.0	2.96	6270.0	0.00121	0.0275	1.93	0.00706	1.10701	0.716
900.0	12.23	266.0	2.81	6130.0	0.00103	0.0286	2.03	0.00836	1.09525	0.714
1000.0	11.03	296.0	2.69	6030.0	0.000934	0.0298	2.13	0.00972	1.08600	0.712
1500.0	7.631	459.0	2.26	5730.0	0.000609					
2000.0	5.867	630.0	2.02	5570.0	0.000458					
2500.0	4.780	802.0	1.88	5470.0	0.000369					
3000.0	4.037	973.0	1.80	5390.0	0.000310					
3500.0	3.495	1140.0	1.74	5340.0	0.000268					

* TWO-PHASE BOUNDARY

6000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
130.0	0.01805	2300.0	177.0	-61.59	-41.54	0.6035	0.3160	0.4235	3775.0
135.0	0.01815	2120.0	172.0	-59.63	-39.42	0.6199	0.3063	0.4221	3677.0
140.0	0.01832	1970.0	167.0	-57.67	-37.31	0.6343	0.2969	0.4209	3595.0
145.0	0.01847	1840.0	163.0	-55.73	-35.21	0.6480	0.2882	0.4202	3525.0
150.0	0.01862	1730.0	158.0	-53.80	-33.11	0.6638	0.2804	0.4198	3463.0
155.0	0.01879	1630.0	153.0	-51.89	-31.01	0.6776	0.2736	0.4196	3407.0
160.0	0.01896	1550.0	149.0	-49.98	-28.92	0.6909	0.2676	0.4196	3354.0
165.0	0.01913	1470.0	144.0	-48.07	-26.82	0.7038	0.2624	0.4197	3304.0
170.0	0.01931	1410.0	139.0	-46.16	-24.72	0.7163	0.2579	0.4197	3255.0
175.0	0.01950	1340.0	134.0	-44.29	-22.62	0.7285	0.2540	0.4197	3208.0
180.0	0.01969	1290.0	130.0	-42.40	-20.52	0.7403	0.2507	0.4197	3161.0
185.0	0.01989	1240.0	125.0	-40.52	-18.42	0.7518	0.2477	0.4197	3115.0
190.0	0.02009	1190.0	121.0	-38.65	-16.32	0.7630	0.2450	0.4196	3070.0
200.0	0.02051	1100.0	112.0	-34.92	-12.13	0.7845	0.2406	0.4194	2981.0
205.0	0.02073	1060.0	108.0	-33.07	-10.03	0.7949	0.2386	0.4192	2937.0
210.0	0.02095	1020.0	104.0	-31.22	-7.946	0.8050	0.2368	0.4190	2893.0
215.0	0.02118	985.0	101.0	-29.38	-5.852	0.8148	0.2352	0.4187	2851.0
220.0	0.02141	951.0	97.0	-27.54	-3.760	0.8245	0.2336	0.4183	2809.0
225.0	0.02165	919.0	93.5	-25.71	-1.669	0.8338	0.2322	0.4179	2768.0
230.0	0.02189	888.0	90.1	-23.89	0.4186	0.8430	0.2308	0.4175	2728.0
235.0	0.02213	858.0	86.9	-22.08	2.505	0.8520	0.2294	0.4170	2689.0
240.0	0.02239	831.0	83.8	-20.27	4.588	0.8608	0.2281	0.4164	2650.0
245.0	0.02264	804.0	80.8	-18.48	6.668	0.8694	0.2269	0.4157	2613.0
250.0	0.02290	779.0	78.0	-16.69	8.745	0.8777	0.2256	0.4150	2577.0
255.0	0.02315	755.0	75.2	-14.91	10.82	0.8860	0.2245	0.4142	2542.0
260.0	0.02343	733.0	72.6	-13.14	12.89	0.8940	0.2233	0.4133	2507.0
265.0	0.02371	712.0	70.1	-11.38	14.95	0.9019	0.2222	0.4124	2474.0
270.0	0.02399	692.0	67.6	-9.640	17.01	0.9096	0.2211	0.4114	2442.0
275.0	0.02427	673.0	65.3	-7.901	19.07	0.9171	0.2200	0.4103	2411.0
280.0	0.02456	655.0	63.1	-6.173	21.11	0.9245	0.2190	0.4092	2381.0
285.0	0.02485	638.0	61.0	-4.455	23.16	0.9317	0.2179	0.4080	2352.0
290.0	0.02515	622.0	58.9	-2.749	25.19	0.9388	0.2169	0.4067	2324.0
295.0	0.02545	607.0	57.0	-1.054	27.22	0.9457	0.2160	0.4054	2297.0
300.0	0.02576	592.0	55.1	0.6279	29.25	0.9525	0.2150	0.4041	2271.0
310.0	0.02633	566.0	51.6	3.959	33.27	0.9657	0.2132	0.4012	2222.0
320.0	0.02703	543.0	48.4	7.242	37.27	0.9784	0.2114	0.3982	2176.0
330.0	0.02769	522.0	45.4	10.48	41.24	0.9906	0.2098	0.3951	2134.0
340.0	0.02836	504.0	42.7	13.66	45.17	1.002	0.2083	0.3918	2096.0
350.0	0.02905	488.0	40.3	16.80	49.07	1.014	0.2068	0.3884	2061.0
360.0	0.02975	474.0	38.0	19.88	52.94	1.025	0.2054	0.3849	2029.0
370.0	0.03047	462.0	35.9	22.92	56.77	1.035	0.2042	0.3814	2000.0
380.0	0.03113	452.0	34.0	25.91	60.57	1.045	0.2030	0.3778	1974.0
390.0	0.03193	443.0	32.2	28.85	64.33	1.055	0.2018	0.3741	1950.0
400.0	0.03268	435.0	30.6	31.74	68.05	1.064	0.2008	0.3705	1929.0
410.0	0.03343	429.0	29.1	34.59	71.74	1.074	0.1998	0.3669	1911.0
420.0	0.03419	424.0	27.7	37.40	75.39	1.082	0.1989	0.3633	1894.0
430.0	0.03496	420.0	26.4	40.16	79.00	1.091	0.1981	0.3598	1879.0
440.0	0.03573	416.0	25.2	42.89	82.58	1.099	0.1973	0.3563	1867.0
450.0	0.03650	414.0	24.1	45.57	86.13	1.107	0.1965	0.3529	1855.0
460.0	0.03728	412.0	23.1	48.22	89.64	1.115	0.1958	0.3496	1846.0
470.0	0.03806	411.0	22.2	50.83	93.12	1.122	0.1952	0.3464	1838.0
480.0	0.03885	410.0	21.3	53.41	96.57	1.129	0.1946	0.3432	1831.0
490.0	0.03963	410.0	20.5	55.95	100.0	1.137	0.1940	0.3402	1825.0
500.0	0.04042	410.0	19.7	58.47	103.4	1.143	0.1935	0.3373	1820.0
510.0	0.04121	411.0	19.0	60.95	106.7	1.150	0.1930	0.3345	1816.0
520.0	0.04199	412.0	18.4	63.41	110.1	1.156	0.1926	0.3317	1813.0
530.0	0.04278	413.0	17.8	65.84	113.4	1.163	0.1921	0.3291	1811.0
540.0	0.04356	415.0	17.2	68.24	116.6	1.169	0.1917	0.3266	1810.0
550.0	0.04435	417.0	16.6	70.63	119.9	1.175	0.1914	0.3242	1809.0
560.0	0.04513	419.0	16.1	72.98	123.1	1.181	0.1910	0.3219	1809.0
570.0	0.04592	421.0	15.6	75.32	126.3	1.186	0.1907	0.3197	1809.0
580.0	0.04670	424.0	15.2	77.64	129.5	1.192	0.1904	0.3176	1810.0
590.0	0.04748	427.0	14.7	79.94	132.7	1.197	0.1901	0.3155	1811.0
600.0	0.04825	430.0	14.3	82.22	135.8	1.203	0.1898	0.3136	1813.0
700.0	0.05593	464.0	11.2	104.2	166.4	1.250	0.1881	0.2982	1846.0
800.0	0.06333	503.0	9.23	125.2	195.7	1.289	0.1877	0.2885	1893.0
900.0	0.07065	544.0	7.85	145.7	224.2	1.322	0.1883	0.2826	1945.0
1000.0	0.07781	586.0	6.84	165.8	252.3	1.352	0.1898	0.2793	1999.0
1500.0	0.1120	791.0	4.21	267.0	391.5	1.465	0.2025	0.2805	2254.0
2000.0	0.1449	989.0	3.07	372.8	533.9	1.547	0.2151	0.2892	2483.0
2500.0	0.1773	1180.0	2.43	483.4	680.5	1.612	0.2244	0.2967	2693.0
3000.0	0.2095	1360.0	2.01	597.6	830.3	1.667	0.2308	0.3022	2889.0
3500.0	0.2414	1570.0	1.72	714.2	982.5	1.714	0.2352	0.3063	3073.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

6000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
130.0	55.39	304.0	10.1	127000.0	0.00140					
135.0	54.99	285.0	10.2	116000.0	0.00143					
140.0	54.58	270.0	10.3	107000.0	0.00150					
145.0	54.14	257.0	10.4	100000.0	0.00161					
150.0	53.69	246.0	10.5	92800.0	0.00170					
155.0	53.23	238.0	10.5	86900.0	0.00177					
160.0	52.75	231.0	10.5	81700.0	0.00182					
165.0	52.27	225.0	10.5	77000.0	0.00187					
170.0	51.78	220.0	10.4	72800.0	0.00191					
175.0	51.28	215.0	10.3	68900.0	0.00195					
180.0	50.78	212.0	10.2	65400.0	0.00198					
185.0	50.27	208.0	10.1	62100.0	0.00202					
190.0	49.77	205.0	9.91	59100.0	0.00204					
200.0	48.75	200.0	9.58	53600.0	0.00210					
205.0	48.23	198.0	9.41	51100.0	0.00212					
210.0	47.72	196.0	9.23	48700.0	0.00214					
215.0	47.21	194.0	9.06	46500.0	0.00216					
220.0	46.70	192.0	8.89	44400.0	0.00218					
225.0	46.19	190.0	8.72	42400.0	0.00220					
230.0	45.68	188.0	8.55	40600.0	0.00222					
235.0	45.18	186.0	8.38	38800.0	0.00224					
240.0	44.67	184.0	8.22	37100.0	0.00226					
245.0	44.17	183.0	8.07	35500.0	0.00228					
250.0	43.67	181.0	7.91	34000.0	0.00229					
255.0	43.17	180.0	7.76	32600.0	0.00231					
260.0	42.67	178.0	7.62	31300.0	0.00232					
265.0	42.18	177.0	7.48	30000.0	0.00233					
270.0	41.69	175.0	7.34	28800.0	0.00235					
275.0	41.20	174.0	7.21	27700.0	0.00236					
280.0	40.72	173.0	7.08	26700.0	0.00237					
285.0	40.24	172.0	6.95	25700.0	0.00238					
290.0	39.76	171.0	6.83	24700.0	0.00239					
295.0	39.29	170.0	6.72	23800.0	0.00239					
300.0	38.82	169.0	6.60	23000.0	0.00240					
310.0	37.90	167.0	6.39	21500.0	0.00241					
320.0	37.00	165.0	6.19	20100.0	0.00241					
330.0	36.12	164.0	6.00	18900.0	0.00241					
340.0	35.26	163.0	5.82	17800.0	0.00240					
350.0	34.42	162.0	5.66	16800.0	0.00240					
360.0	33.61	162.0	5.50	15900.0	0.00238					
370.0	32.82	161.0	5.36	15200.0	0.00237					
380.0	32.06	161.0	5.22	14500.0	0.00234					
390.0	31.32	161.0	5.09	13900.0	0.00232					
400.0	30.60	162.0	4.97	13300.0	0.00229					
410.0	29.91	162.0	4.86	12800.0	0.00226					
420.0	29.25	163.0	4.76	12400.0	0.00223					
430.0	28.61	164.0	4.66	12000.0	0.00220					
440.0	27.99	165.0	4.57	11700.0	0.00217					
450.0	27.39	166.0	4.48	11300.0	0.00213					
460.0	26.82	167.0	4.40	11000.0	0.00209					
470.0	26.27	168.0	4.33	10800.0	0.00206					
480.0	25.74	170.0	4.26	10600.0	0.00202					
490.0	25.23	172.0	4.19	10300.0	0.00198					
500.0	24.74	173.0	4.12	10100.0	0.00195					
510.0	24.27	175.0	4.06	10000.0	0.00191					
520.0	23.81	177.0	4.01	9810.0	0.00187					
530.0	23.38	179.0	3.95	9660.0	0.00184					
540.0	22.95	181.0	3.90	9530.0	0.00180					
550.0	22.55	183.0	3.85	9400.0	0.00177					
560.0	22.16	185.0	3.81	9280.0	0.00174					
570.0	21.78	188.0	3.76	9180.0	0.00170					
580.0	21.41	190.0	3.72	9080.0	0.00167					
590.0	21.06	192.0	3.68	8990.0	0.00164					
600.0	20.72	195.0	3.64	8900.0	0.00161					
700.0	17.88	220.0	3.34	8290.0	0.00135					
800.0	15.77	248.0	3.12	7940.0	0.00116					
900.0	14.15	277.0	2.95	7700.0	0.00102					
1000.0	12.85	308.0	2.81	7530.0	0.000908					
1500.0	8.927	471.0	2.33	7060.0	0.000536					
2000.0	6.893	643.0	2.07	6830.0	0.000450					
2500.0	5.633	816.0	1.92	6670.0	0.000363					
3000.0	4.774	988.0	1.82	6570.0	0.000306					
3500.0	4.142	1160.0	1.76	6490.0	0.000265					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

8000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
135.0	0.01790	2460.0	168.0	-60.47	-33.96	0.6105	0.3137	0.4057	3840.0
140.0	0.01801	2300.0	166.0	-58.61	-31.93	0.6252	0.3033	0.4043	3767.0
145.0	0.01813	2160.0	164.0	-56.77	-29.91	0.6394	0.2939	0.4038	3705.0
150.0	0.01825	2030.0	161.0	-54.95	-27.99	0.6531	0.2855	0.4039	3652.0
155.0	0.01840	1930.0	158.0	-53.13	-25.87	0.6663	0.2783	0.4044	3604.0
160.0	0.01854	1840.0	155.0	-51.31	-23.85	0.6792	0.2720	0.4051	3559.0
165.0	0.01869	1750.0	151.0	-49.50	-21.82	0.6915	0.2666	0.4058	3517.0
170.0	0.01884	1680.0	148.0	-47.70	-19.79	0.7038	0.2619	0.4066	3477.0
175.0	0.01900	1610.0	144.0	-45.90	-17.76	0.7156	0.2578	0.4071	3437.0
180.0	0.01915	1560.0	140.0	-44.10	-15.72	0.7270	0.2543	0.4076	3398.0
185.0	0.01933	1500.0	136.0	-42.31	-13.68	0.7382	0.2513	0.4079	3359.0
190.0	0.01950	1450.0	131.0	-40.53	-11.64	0.7491	0.2486	0.4081	3320.0
200.0	0.01985	1360.0	124.0	-36.97	-7.563	0.7700	0.2441	0.4079	3243.0
205.0	0.02003	1320.0	120.0	-35.19	-5.529	0.7801	0.2421	0.4077	3205.0
210.0	0.02021	1280.0	116.0	-33.43	-3.491	0.7899	0.2404	0.4073	3167.0
215.0	0.02040	1240.0	112.0	-31.67	-1.456	0.7995	0.2387	0.4069	3130.0
220.0	0.02059	1210.0	109.0	-29.92	0.5765	0.8088	0.2372	0.4064	3093.0
225.0	0.02079	1170.0	105.0	-28.17	2.607	0.8180	0.2357	0.4058	3056.0
230.0	0.02098	1140.0	102.0	-26.44	4.634	0.8269	0.2344	0.4051	3020.0
235.0	0.02118	1110.0	98.6	-24.70	6.658	0.8356	0.2331	0.4044	2985.0
240.0	0.02138	1080.0	95.5	-22.98	8.678	0.8441	0.2318	0.4036	2950.0
245.0	0.02158	1050.0	92.5	-21.27	10.69	0.8524	0.2306	0.4027	2917.0
250.0	0.02179	1020.0	89.6	-19.56	12.70	0.8605	0.2294	0.4018	2883.0
255.0	0.02200	1000.0	86.9	-17.87	14.71	0.8685	0.2283	0.4008	2851.0
260.0	0.02221	975.0	84.2	-16.18	16.71	0.8763	0.2272	0.3997	2819.0
265.0	0.02242	952.0	81.6	-14.50	18.71	0.8839	0.2261	0.3987	2788.0
270.0	0.02264	930.0	79.1	-12.83	20.70	0.8913	0.2251	0.3975	2759.0
275.0	0.02285	909.0	76.7	-11.17	22.68	0.8986	0.2240	0.3964	2729.0
280.0	0.02308	889.0	74.4	-9.530	24.66	0.9057	0.2230	0.3951	2701.0
285.0	0.02331	870.0	72.2	-7.889	26.63	0.9127	0.2220	0.3939	2674.0
290.0	0.02353	852.0	70.1	-6.259	28.60	0.9195	0.2211	0.3926	2647.0
295.0	0.02375	834.0	68.0	-4.638	30.56	0.9262	0.2201	0.3913	2621.0
300.0	0.02399	818.0	66.1	-3.028	32.51	0.9328	0.2192	0.3900	2596.0
310.0	0.02446	787.0	62.4	0.1611	36.40	0.9455	0.2174	0.3872	2549.0
320.0	0.02494	760.0	59.0	3.310	40.26	0.9578	0.2157	0.3844	2504.0
330.0	0.02543	735.0	55.8	6.418	44.09	0.9696	0.2141	0.3815	2463.0
340.0	0.02592	712.0	52.9	9.485	47.89	0.9809	0.2126	0.3785	2425.0
350.0	0.02642	692.0	50.2	12.51	51.66	0.9918	0.2111	0.3756	2389.0
360.0	0.02693	674.0	47.7	15.50	55.40	1.002	0.2097	0.3727	2356.0
370.0	0.02745	658.0	45.3	18.45	59.11	1.013	0.2084	0.3697	2325.0
380.0	0.02797	643.0	43.2	21.35	62.79	1.022	0.2072	0.3668	2296.0
390.0	0.02850	630.0	41.2	24.22	66.45	1.032	0.2060	0.3639	2270.0
400.0	0.02903	618.0	39.3	27.06	70.07	1.041	0.2049	0.3611	2246.0
410.0	0.02957	607.0	37.6	29.86	73.67	1.050	0.2039	0.3582	2224.0
420.0	0.03012	598.0	36.0	32.62	77.24	1.059	0.2029	0.3555	2203.0
430.0	0.03065	590.0	34.5	35.35	80.78	1.067	0.2020	0.3527	2185.0
440.0	0.03121	583.0	33.1	38.05	84.29	1.075	0.2011	0.3501	2168.0
450.0	0.03177	577.0	31.8	40.72	87.78	1.083	0.2003	0.3474	2152.0
460.0	0.03233	571.0	30.5	43.35	91.24	1.090	0.1996	0.3449	2138.0
470.0	0.03289	567.0	29.4	45.96	94.68	1.098	0.1989	0.3424	2126.0
480.0	0.03345	563.0	28.3	48.54	98.09	1.105	0.1982	0.3399	2114.0
490.0	0.03401	559.0	27.3	51.09	101.5	1.112	0.1976	0.3375	2104.0
500.0	0.03458	556.0	26.4	53.61	104.8	1.119	0.1970	0.3352	2095.0
510.0	0.03515	554.0	25.5	56.12	108.2	1.125	0.1964	0.3330	2086.0
520.0	0.03571	553.0	24.6	58.59	111.5	1.132	0.1959	0.3308	2079.0
530.0	0.03628	551.0	23.8	61.05	114.8	1.138	0.1954	0.3287	2073.0
540.0	0.03685	550.0	23.1	63.48	118.1	1.144	0.1949	0.3266	2067.0
550.0	0.03742	550.0	22.4	65.89	121.3	1.150	0.1945	0.3247	2062.0
560.0	0.03799	550.0	21.7	68.28	124.6	1.156	0.1941	0.3227	2058.0
570.0	0.03855	550.0	21.1	70.65	127.8	1.162	0.1937	0.3209	2055.0
580.0	0.03913	551.0	20.5	73.01	131.0	1.167	0.1933	0.3191	2052.0
590.0	0.03971	551.0	19.9	75.35	134.2	1.173	0.1930	0.3174	2049.0
600.0	0.04028	552.0	19.4	77.67	137.3	1.178	0.1927	0.3157	2047.0
700.0	0.04595	572.0	15.3	100.1	168.2	1.226	0.1905	0.3019	2050.0
800.0	0.05153	603.0	12.6	121.5	197.9	1.265	0.1898	0.2926	2076.0
900.0	0.05701	639.0	10.7	142.4	226.8	1.299	0.1901	0.2867	2112.0
1000.0	0.06239	677.0	9.28	162.9	255.3	1.329	0.1914	0.2831	2154.0
1500.0	0.08825	875.0	5.67	265.2	396.0	1.443	0.2035	0.2829	2374.0
2000.0	0.1131	1070.0	4.11	371.8	539.3	1.526	0.2158	0.2907	2585.0
2500.0	0.1375	1260.0	3.24	482.8	686.5	1.592	0.2249	0.2976	2784.0
3000.0	0.1616	1460.0	2.68	597.3	836.7	1.646	0.2312	0.3028	2972.0
3500.0	0.1856	1650.0	2.29	714.1	989.1	1.693	0.2356	0.3066	3150.0

* TWO-PHASE BOUNDARY

8000 PSIA IS08AR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(DH/DV)_P$ BTU/LB	$V(DP/DU)_V - V(DP/DV)_T$ PSIA-CU FT/BTU	PSIA	$(DV/DT)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
135.0	55.87	332.0	9.59	137000.0	0.00122					
140.0	55.52	310.0	9.87	128000.0	0.00130					
145.0	55.15	293.0	10.1	119000.0	0.00138					
150.0	54.76	279.0	10.3	111000.0	0.00145					
155.0	54.35	268.0	10.5	105000.0	0.00151					
160.0	53.94	259.0	10.6	99000.0	0.00156					
165.0	53.51	252.0	10.6	93900.0	0.00161					
170.0	53.08	246.0	10.6	89200.0	0.00165					
175.0	52.63	241.0	10.6	85000.0	0.00169					
180.0	52.19	237.0	10.5	81200.0	0.00172					
185.0	51.74	234.0	10.4	77600.0	0.00175					
190.0	51.29	231.0	10.3	74300.0	0.00177					
200.0	50.38	226.0	10.0	68400.0	0.00180					
205.0	49.92	224.0	9.90	65700.0	0.00182					
210.0	49.47	222.0	9.75	63200.0	0.00183					
215.0	49.02	220.0	9.59	60800.0	0.00185					
220.0	48.56	219.0	9.43	58500.0	0.00186					
225.0	48.11	217.0	9.27	56400.0	0.00187					
230.0	47.67	216.0	9.12	54300.0	0.00188					
235.0	47.22	215.0	8.96	52300.0	0.00188					
240.0	46.78	213.0	8.81	50500.0	0.00189					
245.0	46.34	212.0	8.66	48700.0	0.00190					
250.0	45.90	211.0	8.51	47000.0	0.00191					
255.0	45.46	210.0	8.37	45400.0	0.00191					
260.0	45.03	209.0	8.23	43900.0	0.00192					
265.0	44.60	207.0	8.09	42500.0	0.00192					
270.0	44.17	206.0	7.96	41100.0	0.00193					
275.0	43.75	205.0	7.83	39800.0	0.00193					
280.0	43.33	204.0	7.70	38500.0	0.00193					
285.0	42.91	204.0	7.58	37300.0	0.00194					
290.0	42.50	203.0	7.46	36200.0	0.00194					
295.0	42.09	202.0	7.35	35100.0	0.00194					
300.0	41.68	201.0	7.23	34100.0	0.00194					
310.0	40.88	200.0	7.02	32200.0	0.00194					
320.0	40.10	199.0	6.82	30500.0	0.00194					
330.0	39.33	198.0	6.63	28900.0	0.00193					
340.0	38.58	197.0	6.45	27500.0	0.00192					
350.0	37.84	196.0	6.28	26200.0	0.00192					
360.0	37.13	196.0	6.12	25000.0	0.00190					
370.0	36.43	195.0	5.97	24000.0	0.00189					
380.0	35.75	195.0	5.83	23000.0	0.00188					
390.0	35.09	195.0	5.70	22100.0	0.00186					
400.0	34.44	195.0	5.57	21300.0	0.00185					
410.0	33.81	196.0	5.45	20500.0	0.00183					
420.0	33.20	196.0	5.34	19900.0	0.00181					
430.0	32.61	197.0	5.23	19200.0	0.00179					
440.0	32.04	198.0	5.13	18700.0	0.00177					
450.0	31.48	199.0	5.04	18100.0	0.00175					
460.0	30.93	200.0	4.95	17700.0	0.00173					
470.0	30.41	201.0	4.86	17200.0	0.00171					
480.0	29.90	202.0	4.78	16800.0	0.00168					
490.0	29.40	203.0	4.70	16400.0	0.00166					
500.0	26.92	205.0	4.63	16100.0	0.00164					
510.0	28.45	206.0	4.56	15800.0	0.00162					
520.0	28.00	208.0	4.49	15500.0	0.00159					
530.0	27.56	209.0	4.43	15200.0	0.00157					
540.0	27.14	211.0	4.37	14900.0	0.00155					
550.0	26.72	213.0	4.31	14700.0	0.00152					
560.0	26.32	215.0	4.26	14500.0	0.00150					
570.0	25.93	217.0	4.20	14300.0	0.00148					
580.0	25.55	219.0	4.15	14100.0	0.00146					
590.0	25.19	221.0	4.10	13900.0	0.00144					
600.0	24.83	223.0	4.06	13700.0	0.00142					
700.0	21.76	246.0	3.68	12500.0	0.00123					
800.0	19.41	273.0	3.41	11700.0	0.00107					
900.0	17.54	301.0	3.20	11200.0	0.000952					
1000.0	16.03	331.0	3.03	10800.0	0.000856					
1500.0	11.33	495.0	2.46	9910.0	0.000572					
2000.0	8.841	669.0	2.16	9470.0	0.000434					
2500.0	7.274	844.0	1.98	9200.0	0.000352					
3000.0	6.188	1020.0	1.87	9010.0	0.000298					
3500.0	5.388	1190.0	1.80	8870.0	0.000258					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

10000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
140.0	0.01775	2630.0	163.0	-59.29	-26.42	0.6173	0.3063	0.3886	3933.0
145.0	0.01785	2480.0	163.0	-57.54	-24.48	0.6309	0.2965	0.3882	3877.0
150.0	0.01795	2340.0	162.0	-55.80	-22.54	0.6441	0.2879	0.3887	3828.0
155.0	0.01803	2230.0	161.0	-54.06	-20.59	0.6568	0.2806	0.3899	3786.0
160.0	0.01820	2120.0	159.0	-52.34	-18.64	0.6692	0.2742	0.3914	3747.0
165.0	0.01832	2030.0	157.0	-50.61	-16.68	0.6813	0.2688	0.3930	3710.0
170.0	0.01845	1950.0	154.0	-48.88	-14.71	0.6931	0.2642	0.3946	3675.0
175.0	0.01859	1880.0	151.0	-47.16	-12.73	0.7045	0.2603	0.3961	3640.0
180.0	0.01873	1810.0	148.0	-45.44	-10.75	0.7157	0.2568	0.3973	3606.0
185.0	0.01888	1760.0	144.0	-43.72	-8.766	0.7266	0.2539	0.3982	3572.0
190.0	0.01903	1700.0	140.0	-42.00	-6.773	0.7372	0.2513	0.3989	3538.0
200.0	0.01933	1600.0	133.0	-38.57	-2.780	0.7577	0.2469	0.3996	3469.0
205.0	0.01949	1560.0	129.0	-36.86	-0.7831	0.7676	0.2450	0.3996	3435.0
210.0	0.01965	1520.0	126.0	-35.16	1.214	0.7772	0.2433	0.3994	3401.0
215.0	0.01981	1480.0	122.0	-33.46	3.211	0.7866	0.2418	0.3991	3367.0
220.0	0.01997	1450.0	119.0	-31.76	5.206	0.7958	0.2403	0.3987	3333.0
225.0	0.02013	1410.0	115.0	-30.08	7.198	0.8047	0.2389	0.3981	3300.0
230.0	0.02030	1380.0	112.0	-28.40	9.186	0.8135	0.2377	0.3974	3267.0
235.0	0.02047	1350.0	109.0	-26.72	11.17	0.8220	0.2364	0.3967	3234.0
240.0	0.02064	1320.0	106.0	-25.06	13.15	0.8303	0.2352	0.3958	3202.0
245.0	0.02081	1290.0	103.0	-23.40	15.13	0.8385	0.2341	0.3949	3171.0
250.0	0.02098	1260.0	100.0	-21.75	17.10	0.8465	0.2330	0.3940	3140.0
255.0	0.02115	1230.0	96.9	-20.10	19.07	0.8543	0.2319	0.3930	3110.0
260.0	0.02134	1210.0	94.1	-18.47	21.03	0.8619	0.2308	0.3919	3080.0
265.0	0.02152	1180.0	91.5	-16.84	22.99	0.8693	0.2298	0.3908	3051.0
270.0	0.02170	1160.0	89.0	-15.23	24.94	0.8766	0.2288	0.3896	3023.0
275.0	0.02188	1140.0	86.5	-13.62	26.88	0.8838	0.2278	0.3884	2995.0
280.0	0.02206	1110.0	84.1	-12.02	28.82	0.8908	0.2268	0.3872	2968.0
285.0	0.02224	1090.0	81.9	-10.43	30.76	0.8976	0.2259	0.3859	2942.0
290.0	0.02243	1070.0	79.7	-8.853	32.68	0.9043	0.2250	0.3847	2916.0
295.0	0.02262	1050.0	77.5	-7.280	34.60	0.9109	0.2240	0.3834	2891.0
300.0	0.02281	1040.0	75.5	-5.716	36.52	0.9173	0.2231	0.3821	2867.0
310.0	0.02319	1000.0	71.6	-2.615	40.32	0.9298	0.2214	0.3794	2821.0
320.0	0.02358	971.0	68.0	0.4481	44.10	0.9418	0.2197	0.3767	2777.0
330.0	0.02397	943.0	64.7	3.476	47.86	0.9533	0.2181	0.3739	2736.0
340.0	0.02435	917.0	61.6	6.467	51.58	0.9645	0.2166	0.3712	2698.0
350.0	0.02475	893.0	58.7	9.423	55.28	0.9752	0.2151	0.3685	2662.0
360.0	0.02517	871.0	56.0	12.34	58.95	0.9855	0.2137	0.3657	2628.0
370.0	0.02558	851.0	53.5	15.23	62.60	0.996	0.2124	0.3631	2597.0
380.0	0.02593	833.0	51.2	18.08	66.21	1.005	0.2111	0.3604	2567.0
390.0	0.02641	817.0	49.0	20.90	69.81	1.014	0.2099	0.3578	2540.0
400.0	0.02683	802.0	46.9	23.69	73.37	1.024	0.2088	0.3553	2514.0
410.0	0.02725	788.0	45.0	26.45	76.91	1.032	0.2077	0.3527	2490.0
420.0	0.02763	776.0	43.2	29.17	80.43	1.041	0.2067	0.3503	2468.0
430.0	0.02810	765.0	41.6	31.87	83.92	1.049	0.2057	0.3479	2448.0
440.0	0.02854	754.0	40.0	34.54	87.38	1.057	0.2048	0.3456	2429.0
450.0	0.02897	745.0	38.5	37.19	90.83	1.065	0.2039	0.3433	2411.0
460.0	0.02940	737.0	37.2	39.80	94.25	1.072	0.2031	0.3411	2395.0
470.0	0.02984	730.0	35.9	42.39	97.65	1.079	0.2023	0.3389	2379.0
480.0	0.03028	723.0	34.6	44.96	101.0	1.087	0.2016	0.3368	2365.0
490.0	0.03072	717.0	33.5	47.50	104.4	1.094	0.2009	0.3348	2352.0
500.0	0.03115	712.0	32.4	50.02	107.7	1.100	0.2003	0.3328	2341.0
510.0	0.03160	707.0	31.4	52.52	111.0	1.107	0.1996	0.3309	2330.0
520.0	0.03205	703.0	30.4	55.00	114.3	1.113	0.1990	0.3290	2320.0
530.0	0.03243	699.0	29.5	57.46	117.6	1.119	0.1985	0.3272	2311.0
540.0	0.03294	696.0	28.6	59.90	120.9	1.126	0.1980	0.3254	2302.0
550.0	0.03338	693.0	27.8	62.31	124.1	1.132	0.1975	0.3237	2295.0
560.0	0.03383	691.0	27.0	64.72	127.4	1.137	0.1970	0.3220	2288.0
570.0	0.03429	689.0	26.2	67.10	130.6	1.143	0.1966	0.3204	2282.0
580.0	0.03472	688.0	25.5	69.47	133.8	1.149	0.1961	0.3188	2276.0
590.0	0.03517	687.0	24.9	71.82	136.9	1.154	0.1957	0.3173	2271.0
600.0	0.03562	686.0	24.2	74.16	140.1	1.159	0.1954	0.3159	2267.0
700.0	0.04009	691.0	19.2	96.81	171.1	1.207	0.1927	0.3036	2246.0
800.0	0.04453	712.0	15.8	118.5	201.0	1.247	0.1917	0.2950	2253.0
900.0	0.04890	741.0	13.5	139.6	230.1	1.281	0.1918	0.2893	2275.0
1000.0	0.05322	774.0	11.7	160.3	259.9	1.312	0.1928	0.2857	2306.0
1500.0	0.07402	962.0	7.13	263.7	400.8	1.427	0.2044	0.2848	2493.0
2000.0	0.09400	1160.0	5.16	370.8	544.9	1.510	0.2155	0.2919	2687.0
2500.0	0.1136	1350.0	4.06	482.3	692.6	1.575	0.2254	0.2985	2875.0
3000.0	0.1329	1540.0	3.35	597.0	843.1	1.630	0.2316	0.3034	3055.0
3500.0	0.1521	1730.0	2.86	714.1	996.0	1.677	0.2360	0.3070	3226.0

* TWO-PHASE BOUNDARY

10000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
140.0	56.33	354.0	9.44	148000.0	0.00110					
145.0	56.01	331.0	9.81	139000.0	0.00117					
150.0	55.67	312.0	10.1	130000.0	0.00124					
155.0	55.32	298.0	10.4	123000.0	0.00131					
160.0	54.95	287.0	10.6	117000.0	0.00136					
165.0	54.57	278.0	10.7	111000.0	0.00141					
170.0	54.18	271.0	10.8	106000.0	0.00145					
175.0	53.78	265.0	10.8	101000.0	0.00149					
180.0	53.38	261.0	10.8	96800.0	0.00152					
185.0	52.97	257.0	10.7	93000.0	0.00155					
190.0	52.56	254.0	10.6	89400.0	0.00157					
200.0	51.73	249.0	10.4	83000.0	0.00160					
205.0	51.31	247.0	10.3	80100.0	0.00161					
210.0	50.90	246.0	10.2	77400.0	0.00162					
215.0	50.49	244.0	10.0	74800.0	0.00163					
220.0	50.08	243.0	9.86	72400.0	0.00164					
225.0	49.67	242.0	9.71	70100.0	0.00165					
230.0	49.26	241.0	9.57	67900.0	0.00165					
235.0	48.85	240.0	9.42	65700.0	0.00165					
240.0	48.45	239.0	9.27	63700.0	0.00166					
245.0	48.05	238.0	9.12	61800.0	0.00166					
250.0	47.65	237.0	8.98	60000.0	0.00166					
255.0	47.26	236.0	8.84	58200.0	0.00166					
260.0	46.87	235.0	8.70	56500.0	0.00167					
265.0	46.48	235.0	8.57	54900.0	0.00167					
270.0	46.09	234.0	8.44	53400.0	0.00167					
275.0	45.71	233.0	8.31	51900.0	0.00167					
280.0	45.33	232.0	8.18	50500.0	0.00167					
285.0	44.95	232.0	8.06	49100.0	0.00167					
290.0	44.58	231.0	7.94	47800.0	0.00166					
295.0	44.21	230.0	7.83	46600.0	0.00166					
300.0	43.85	230.0	7.72	45400.0	0.00166					
310.0	43.12	229.0	7.50	43200.0	0.00166					
320.0	42.42	228.0	7.30	41200.0	0.00165					
330.0	41.72	227.0	7.11	39300.0	0.00164					
340.0	41.04	227.0	6.93	37600.0	0.00164					
350.0	40.38	226.0	6.76	36100.0	0.00163					
360.0	39.73	226.0	6.59	34600.0	0.00162					
370.0	39.09	226.0	6.44	33300.0	0.00161					
380.0	38.47	226.0	6.30	32100.0	0.00160					
390.0	37.87	226.0	6.16	30900.0	0.00158					
400.0	37.27	226.0	6.03	29900.0	0.00157					
410.0	36.70	227.0	5.91	28900.0	0.00156					
420.0	36.13	227.0	5.79	28000.0	0.00154					
430.0	35.58	228.0	5.68	27200.0	0.00153					
440.0	35.04	228.0	5.57	26400.0	0.00151					
450.0	34.52	229.0	5.47	25700.0	0.00150					
460.0	34.01	230.0	5.38	25100.0	0.00148					
470.0	33.51	231.0	5.29	24400.0	0.00147					
480.0	33.03	232.0	5.20	23900.0	0.00145					
490.0	32.55	233.0	5.12	23300.0	0.00143					
500.0	32.09	235.0	5.04	22800.0	0.00142					
510.0	31.64	236.0	4.96	22400.0	0.00140					
520.0	31.21	237.0	4.89	21900.0	0.00139					
530.0	30.78	239.0	4.82	21500.0	0.00137					
540.0	30.36	240.0	4.76	21100.0	0.00135					
550.0	29.96	242.0	4.69	20800.0	0.00134					
560.0	29.56	244.0	4.63	20400.0	0.00132					
570.0	29.18	246.0	4.58	20100.0	0.00130					
580.0	28.80	247.0	4.52	19800.0	0.00129					
590.0	28.43	249.0	4.47	19500.0	0.00127					
600.0	28.08	251.0	4.41	19300.0	0.00126					
700.0	24.94	273.0	3.99	17200.0	0.00111					
800.0	22.46	298.0	3.68	16000.0	0.000990					
900.0	20.45	326.0	3.43	15100.0	0.000889					
1000.0	18.79	355.0	3.23	14500.0	0.000805					
1500.0	13.51	519.0	2.58	13000.0	0.000548					
2000.0	10.64	696.0	2.24	12300.0	0.000420					
2500.0	8.806	872.0	2.05	11900.0	0.000342					
3000.0	7.525	1050.0	1.92	11600.0	0.000290					
3500.0	6.574	1220.0	1.84	11400.0	0.000252					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

20000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
165.0	0.01715	3480.0	162.0	-53.28	10.24	0.6461	0.2639	0.3316	4503.0
170.0	0.01722	3350.0	165.0	-51.87	11.91	0.6561	0.2614	0.3374	4474.0
175.0	0.01730	3220.0	167.0	-50.44	13.61	0.6660	0.2594	0.3433	4446.0
180.0	0.01733	3110.0	168.0	-49.01	15.35	0.6757	0.2579	0.3491	4419.0
185.0	0.01746	3020.0	168.0	-47.56	17.10	0.6854	0.2567	0.3544	4392.0
190.0	0.01755	2930.0	167.0	-46.09	18.89	0.6949	0.2558	0.3594	4365.0
200.0	0.01773	2770.0	164.0	-43.13	22.53	0.7136	0.2542	0.3675	4310.0
205.0	0.01782	2710.0	162.0	-41.63	24.37	0.7227	0.2535	0.3707	4283.0
210.0	0.01792	2650.0	160.0	-40.12	26.23	0.7316	0.2529	0.3734	4256.0
215.0	0.01802	2590.0	157.0	-38.61	28.10	0.7404	0.2523	0.3755	4229.0
220.0	0.01812	2540.0	154.0	-37.10	29.99	0.7491	0.2516	0.3771	4202.0
225.0	0.01822	2500.0	152.0	-35.58	31.87	0.7576	0.2510	0.3783	4175.0
230.0	0.01832	2450.0	149.0	-34.06	33.77	0.7659	0.2504	0.3792	4148.0
235.0	0.01842	2410.0	146.0	-32.54	35.67	0.7741	0.2497	0.3797	4122.0
240.0	0.01852	2370.0	143.0	-31.03	37.56	0.7821	0.2491	0.3799	4096.0
245.0	0.01863	2340.0	140.0	-29.51	39.46	0.7899	0.2484	0.3798	4071.0
250.0	0.01873	2310.0	137.0	-28.00	41.36	0.7976	0.2477	0.3796	4046.0
255.0	0.01883	2270.0	134.0	-26.48	43.26	0.8051	0.2470	0.3791	4021.0
260.0	0.01894	2240.0	131.0	-24.98	45.15	0.8124	0.2462	0.3785	3997.0
265.0	0.01904	2210.0	128.0	-23.48	47.04	0.8196	0.2455	0.3778	3973.0
270.0	0.01915	2190.0	126.0	-21.98	48.93	0.8267	0.2447	0.3770	3949.0
275.0	0.01925	2160.0	123.0	-20.49	50.81	0.8336	0.2440	0.3760	3926.0
280.0	0.01936	2130.0	120.0	-19.00	52.69	0.8404	0.2432	0.3750	3903.0
285.0	0.01947	2110.0	118.0	-17.52	54.56	0.8470	0.2424	0.3739	3881.0
290.0	0.01957	2080.0	115.0	-16.05	56.43	0.8535	0.2416	0.3728	3859.0
295.0	0.01968	2060.0	113.0	-14.58	58.29	0.8599	0.2408	0.3717	3838.0
300.0	0.01978	2040.0	111.0	-13.11	60.15	0.8661	0.2400	0.3705	3817.0
310.0	0.02000	1990.0	106.0	-10.21	63.84	0.8782	0.2384	0.3680	3776.0
320.0	0.02021	1950.0	102.0	-7.339	67.51	0.8898	0.2368	0.3656	3738.0
330.0	0.02042	1910.0	98.0	-4.486	71.15	0.9011	0.2352	0.3630	3700.0
340.0	0.02064	1880.0	94.3	-1.659	74.77	0.9119	0.2337	0.3605	3664.0
350.0	0.02085	1840.0	90.8	1.141	78.36	0.9223	0.2322	0.3581	3630.0
360.0	0.02106	1810.0	87.5	3.916	81.93	0.9323	0.2307	0.3556	3598.0
370.0	0.02128	1780.0	84.4	6.667	85.47	0.9420	0.2292	0.3532	3566.0
380.0	0.02149	1750.0	81.5	9.392	88.99	0.9514	0.2278	0.3509	3537.0
390.0	0.02171	1730.0	78.7	12.09	92.49	0.9605	0.2264	0.3486	3508.0
400.0	0.02192	1700.0	76.1	14.77	95.97	0.9693	0.2251	0.3464	3481.0
410.0	0.02214	1680.0	73.6	17.43	99.42	0.9778	0.2238	0.3442	3455.0
420.0	0.02235	1650.0	71.3	20.06	102.9	0.9861	0.2226	0.3421	3431.0
430.0	0.02257	1630.0	69.1	22.67	106.3	0.9941	0.2214	0.3401	3407.0
440.0	0.02279	1610.0	67.0	25.27	109.7	1.002	0.2202	0.3381	3385.0
450.0	0.02300	1590.0	65.0	27.84	113.0	1.010	0.2191	0.3362	3364.0
460.0	0.02322	1570.0	63.1	30.39	116.4	1.017	0.2180	0.3344	3344.0
470.0	0.02343	1560.0	61.3	32.92	119.7	1.024	0.2170	0.3326	3324.0
480.0	0.02365	1540.0	59.6	35.44	123.0	1.031	0.2160	0.3309	3306.0
490.0	0.02387	1520.0	58.0	37.93	126.3	1.038	0.2151	0.3292	3289.0
500.0	0.02408	1510.0	56.5	40.42	129.6	1.044	0.2141	0.3276	3272.0
510.0	0.02430	1500.0	55.0	42.88	132.9	1.051	0.2133	0.3260	3256.0
520.0	0.02452	1480.0	53.6	45.33	136.1	1.057	0.2124	0.3245	3241.0
530.0	0.02474	1470.0	52.3	47.76	139.4	1.063	0.2116	0.3231	3227.0
540.0	0.02495	1460.0	51.0	50.18	142.6	1.069	0.2108	0.3217	3213.0
550.0	0.02517	1450.0	49.8	52.59	145.8	1.075	0.2101	0.3203	3200.0
560.0	0.02539	1440.0	48.6	54.98	149.0	1.081	0.2094	0.3190	3188.0
570.0	0.02561	1430.0	47.5	57.36	152.2	1.087	0.2087	0.3178	3176.0
580.0	0.02582	1420.0	46.4	59.72	155.4	1.092	0.2081	0.3166	3165.0
590.0	0.02604	1410.0	45.4	62.07	158.5	1.098	0.2075	0.3154	3155.0
600.0	0.02625	1410.0	44.4	64.42	161.7	1.103	0.2069	0.3143	3145.0
700.0	0.02844	1350.0	36.3	87.28	192.6	1.151	0.2023	0.3049	3069.0
800.0	0.03061	1320.0	30.6	109.4	222.7	1.191	0.1998	0.2984	3024.0
900.0	0.03278	1310.0	26.4	130.9	252.3	1.226	0.1988	0.2941	3001.0
1000.0	0.03494	1320.0	23.2	152.2	281.6	1.257	0.1990	0.2914	2992.0
1500.0	0.04547	1440.0	14.4	258.1	426.5	1.374	0.2083	0.2908	3047.0
2000.0	0.05565	1600.0	10.4	367.2	573.3	1.459	0.2194	0.2966	3168.0
2500.0	0.06558	1780.0	8.15	480.1	723.0	1.525	0.2277	0.3019	3309.0
3000.0	0.07535	1960.0	6.72	596.0	875.0	1.581	0.2335	0.3059	3453.0
3500.0	0.08502	2150.0	5.72	713.9	1029.0	1.628	0.2375	0.3088	3597.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

20000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)_P/V$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	1/DEG. R	BTU/FT-HR-R	LB/FT-SEC x 10^5	SQ FT/HR		
165.0	58.30	416.0	10.5	203000.0	0.000798					
170.0	58.06	397.0	10.9	194000.0	0.000850					
175.0	57.81	383.0	11.1	186000.0	0.000896					
180.0	57.54	373.0	11.3	179000.0	0.000937					
185.0	57.27	364.0	11.4	173000.0	0.000973					
190.0	56.99	358.0	11.5	167000.0	0.00100					
200.0	56.40	350.0	11.5	156000.0	0.00105					
205.0	56.11	347.0	11.4	152000.0	0.00107					
210.0	55.81	345.0	11.3	148000.0	0.00108					
215.0	55.50	344.0	11.2	144000.0	0.00109					
220.0	55.20	343.0	11.1	140000.0	0.00110					
225.0	54.90	342.0	11.0	137000.0	0.00111					
230.0	54.59	341.0	10.9	134000.0	0.00111					
235.0	54.29	341.0	10.7	131000.0	0.00111					
240.0	53.99	341.0	10.6	128000.0	0.00111					
245.0	53.69	341.0	10.5	126000.0	0.00111					
250.0	53.39	341.0	10.3	123000.0	0.00111					
255.0	53.09	342.0	10.2	121000.0	0.00111					
260.0	52.80	342.0	10.1	118000.0	0.00111					
265.0	52.51	342.0	10.0	116000.0	0.00110					
270.0	52.22	343.0	9.82	114000.0	0.00110					
275.0	51.94	343.0	9.70	112000.0	0.00110					
280.0	51.65	343.0	9.58	110000.0	0.00109					
285.0	51.37	344.0	9.46	108000.0	0.00109					
290.0	51.09	344.0	9.34	106000.0	0.00108					
295.0	50.82	345.0	9.23	105000.0	0.00108					
300.0	50.55	345.0	9.11	103000.0	0.00107					
310.0	50.01	346.0	8.90	100000.0	0.00106					
320.0	49.48	347.0	8.70	96700.0	0.00105					
330.0	48.96	347.0	8.51	93800.0	0.00105					
340.0	48.46	348.0	8.32	91000.0	0.00104					
350.0	47.96	349.0	8.15	88500.0	0.00103					
360.0	47.47	350.0	7.99	86000.0	0.00102					
370.0	47.00	350.0	7.83	83700.0	0.00101					
380.0	46.53	351.0	7.69	81500.0	0.00100					
390.0	46.07	352.0	7.54	79500.0	0.000990					
400.0	45.61	353.0	7.41	77500.0	0.000981					
410.0	45.17	354.0	7.28	75700.0	0.000973					
420.0	44.73	355.0	7.16	73900.0	0.000964					
430.0	44.31	356.0	7.04	72300.0	0.000956					
440.0	43.89	357.0	6.93	70700.0	0.000948					
450.0	43.48	358.0	6.83	69200.0	0.000940					
460.0	43.07	359.0	6.72	67800.0	0.000932					
470.0	42.67	360.0	6.63	66400.0	0.000924					
480.0	42.28	361.0	6.53	65100.0	0.000916					
490.0	41.90	362.0	6.44	63900.0	0.000908					
500.0	41.52	364.0	6.35	62700.0	0.000901					
510.0	41.15	365.0	6.27	61600.0	0.000893					
520.0	40.79	366.0	6.19	60500.0	0.000886					
530.0	40.43	368.0	6.11	59500.0	0.000878					
540.0	40.08	369.0	6.04	58500.0	0.000871					
550.0	39.73	371.0	5.96	57600.0	0.000864					
560.0	39.39	372.0	5.89	56700.0	0.000857					
570.0	39.05	374.0	5.82	55900.0	0.000850					
580.0	38.72	376.0	5.76	55000.0	0.000843					
590.0	38.40	377.0	5.70	54300.0	0.000836					
600.0	38.08	379.0	5.63	53500.0	0.000829					
700.0	35.16	398.0	5.11	47400.0	0.000766					
800.0	32.67	420.0	4.70	43200.0	0.000710					
900.0	30.51	446.0	4.36	40100.0	0.000659					
1000.0	28.62	474.0	4.08	37800.0	0.000615					
1500.0	21.99	639.0	3.13	31600.0	0.000455					
2000.0	17.97	822.0	2.64	28800.0	0.000361					
2500.0	15.25	1010.0	2.35	27200.0	0.000300					
3000.0	13.27	1190.0	2.17	26100.0	0.000253					
3500.0	11.76	1360.0	2.05	25300.0	0.000226					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

40000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
200.0	0.01624	5340.0	165.0	-44.63	75.68	0.6666	0.2434	0.2931	5456.0
205.0	0.01629	5180.0	169.0	-43.45	77.17	0.6740	0.2470	0.3025	5422.0
210.0	0.01633	5040.0	172.0	-42.25	78.70	0.6814	0.2502	0.3113	5389.0
215.0	0.01638	4910.0	175.0	-41.02	80.28	0.6888	0.2531	0.3195	5357.0
220.0	0.01643	4790.0	176.0	-39.76	81.89	0.6962	0.2556	0.3270	5326.0
225.0	0.01648	4670.0	177.0	-38.48	83.55	0.7037	0.2579	0.3338	5295.0
230.0	0.01653	4570.0	177.0	-37.19	85.23	0.7111	0.2597	0.3399	5265.0
235.0	0.01658	4480.0	177.0	-35.87	86.94	0.7184	0.2613	0.3453	5236.0
240.0	0.01664	4390.0	177.0	-34.54	88.68	0.7258	0.2627	0.3501	5208.0
245.0	0.01669	4310.0	176.0	-33.20	90.44	0.7330	0.2637	0.3542	5181.0
250.0	0.01675	4240.0	174.0	-31.84	92.22	0.7402	0.2646	0.3578	5154.0
255.0	0.01681	4170.0	173.0	-30.47	94.02	0.7473	0.2652	0.3608	5129.0
260.0	0.01687	4110.0	171.0	-29.10	95.83	0.7544	0.2657	0.3633	5104.0
265.0	0.01693	4050.0	169.0	-27.72	97.65	0.7613	0.2659	0.3654	5080.0
270.0	0.01699	4000.0	167.0	-26.33	99.48	0.7682	0.2660	0.3670	5057.0
275.0	0.01705	3950.0	165.0	-24.94	101.3	0.7749	0.2660	0.3682	5035.0
280.0	0.01711	3910.0	163.0	-23.55	103.2	0.7815	0.2659	0.3692	5013.0
285.0	0.01717	3860.0	161.0	-22.16	105.0	0.7881	0.2657	0.3698	4992.0
290.0	0.01723	3820.0	159.0	-20.76	106.9	0.7945	0.2654	0.3701	4972.0
295.0	0.01729	3790.0	156.0	-19.37	108.7	0.8008	0.2650	0.3703	4952.0
300.0	0.01735	3750.0	154.0	-17.97	110.6	0.8071	0.2645	0.3702	4933.0
310.0	0.01748	3690.0	149.0	-15.19	114.3	0.8192	0.2634	0.3695	4897.0
320.0	0.01760	3630.0	145.0	-12.42	118.0	0.8309	0.2620	0.3683	4862.0
330.0	0.01773	3580.0	141.0	-9.667	121.6	0.8422	0.2606	0.3666	4830.0
340.0	0.01785	3530.0	136.0	-6.923	125.3	0.8531	0.2591	0.3647	4799.0
350.0	0.01797	3490.0	132.0	-4.196	128.9	0.8637	0.2575	0.3626	4770.0
360.0	0.01809	3440.0	128.0	-1.488	132.5	0.8739	0.2558	0.3604	4742.0
370.0	0.01822	3410.0	125.0	1.201	136.1	0.8837	0.2542	0.3581	4715.0
380.0	0.01834	3370.0	121.0	3.872	139.7	0.8932	0.2525	0.3557	4689.0
390.0	0.01845	3330.0	118.0	6.523	143.2	0.9024	0.2509	0.3534	4665.0
400.0	0.01858	3300.0	115.0	9.155	146.8	0.9113	0.2492	0.3510	4641.0
410.0	0.01870	3270.0	112.0	11.77	150.3	0.9200	0.2476	0.3487	4619.0
420.0	0.01882	3240.0	109.0	14.36	153.7	0.9284	0.2460	0.3465	4597.0
430.0	0.01894	3210.0	106.0	16.94	157.2	0.9365	0.2445	0.3443	4576.0
440.0	0.01905	3180.0	103.0	19.49	160.6	0.9444	0.2430	0.3421	4556.0
450.0	0.01917	3150.0	101.0	22.03	164.0	0.9520	0.2415	0.3400	4536.0
460.0	0.01929	3130.0	98.3	24.56	167.4	0.9595	0.2400	0.3380	4517.0
470.0	0.01940	3100.0	96.0	27.06	170.8	0.9667	0.2386	0.3361	4499.0
480.0	0.01952	3080.0	93.8	29.55	174.1	0.9738	0.2373	0.3342	4481.0
490.0	0.01964	3050.0	91.7	32.02	177.5	0.9807	0.2360	0.3324	4464.0
500.0	0.01975	3030.0	89.7	34.48	180.8	0.9874	0.2347	0.3306	4448.0
510.0	0.01987	3010.0	87.8	36.93	184.1	0.9939	0.2334	0.3289	4432.0
520.0	0.01998	2990.0	85.9	39.35	187.4	1.000	0.2322	0.3273	4417.0
530.0	0.02010	2970.0	84.2	41.77	190.6	1.006	0.2311	0.3257	4402.0
540.0	0.02021	2950.0	82.5	44.17	193.9	1.013	0.2300	0.3242	4388.0
550.0	0.02033	2930.0	80.8	46.56	197.1	1.018	0.2289	0.3228	4374.0
560.0	0.02044	2910.0	79.2	48.94	200.3	1.024	0.2278	0.3214	4360.0
570.0	0.02055	2890.0	77.7	51.30	203.6	1.030	0.2268	0.3201	4347.0
580.0	0.02067	2870.0	76.3	53.66	206.7	1.036	0.2259	0.3188	4334.0
590.0	0.02078	2860.0	74.9	56.00	209.9	1.041	0.2249	0.3175	4322.0
600.0	0.02089	2840.0	73.5	58.33	213.1	1.046	0.2240	0.3163	4310.0
700.0	0.02202	2700.0	62.2	81.14	244.2	1.094	0.2168	0.3068	4210.0
800.0	0.02313	2610.0	53.9	103.3	274.6	1.135	0.2121	0.3005	4137.0
900.0	0.02423	2540.0	47.6	124.9	304.4	1.170	0.2094	0.2967	4082.0
1000.0	0.02533	2490.0	42.5	146.3	333.9	1.201	0.2083	0.2945	4042.0
1500.0	0.03073	2450.0	27.7	253.4	481.0	1.320	0.2140	0.2959	3963.0
2000.0	0.03598	2550.0	20.4	364.0	630.5	1.406	0.2236	0.3019	3991.0
2500.0	0.04110	2690.0	16.1	478.2	782.7	1.474	0.2310	0.3066	4066.0
3000.0	0.04612	2850.0	13.3	595.2	936.8	1.530	0.2362	0.3099	4162.0
3500.0	0.05106	3020.0	11.4	714.2	1092.0	1.578	0.2398	0.3121	4266.0

* TWO-PHASE BOUNDARY

40000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
200.0	61.56	585.0	11.0	329000.0	0.000501					
205.0	61.40	570.0	11.1	318000.0	0.000531					
210.0	61.24	558.0	11.2	309000.0	0.000558					
215.0	61.06	548.0	11.3	300000.0	0.000583					
220.0	60.88	541.0	11.3	291000.0	0.000605					
225.0	60.69	535.0	11.3	284000.0	0.000624					
230.0	60.50	530.0	11.3	277000.0	0.000641					
235.0	60.31	526.0	11.2	270000.0	0.000656					
240.0	60.11	523.0	11.2	264000.0	0.000669					
245.0	59.90	521.0	11.1	258000.0	0.000680					
250.0	59.70	519.0	11.0	253000.0	0.000689					
255.0	59.49	518.0	11.0	248000.0	0.000696					
260.0	59.29	517.0	10.9	244000.0	0.000702					
265.0	59.08	517.0	10.8	240000.0	0.000707					
270.0	58.87	517.0	10.7	236000.0	0.000710					
275.0	58.66	517.0	10.6	232000.0	0.000713					
280.0	58.45	517.0	10.5	228000.0	0.000714					
285.0	58.24	518.0	10.4	225000.0	0.000714					
290.0	58.03	518.0	10.3	222000.0	0.000714					
295.0	57.83	519.0	10.2	219000.0	0.000713					
300.0	57.62	520.0	10.1	216000.0	0.000712					
310.0	57.21	522.0	9.92	211000.0	0.000708					
320.0	56.81	524.0	9.74	206000.0	0.000703					
330.0	56.42	527.0	9.56	202000.0	0.000696					
340.0	56.03	529.0	9.40	198000.0	0.000689					
350.0	55.64	532.0	9.24	194000.0	0.000682					
360.0	55.27	534.0	9.09	190000.0	0.000675					
370.0	54.90	537.0	8.94	187000.0	0.000667					
380.0	54.53	539.0	8.80	184000.0	0.000660					
390.0	54.18	542.0	8.67	181000.0	0.000652					
400.0	53.83	544.0	8.55	178000.0	0.000645					
410.0	53.48	546.0	8.43	175000.0	0.000638					
420.0	53.14	549.0	8.31	172000.0	0.000631					
430.0	52.81	551.0	8.20	169000.0	0.000625					
440.0	52.48	553.0	8.10	167000.0	0.000619					
450.0	52.16	555.0	8.00	165000.0	0.000612					
460.0	51.85	557.0	7.90	162000.0	0.000606					
470.0	51.53	559.0	7.81	160000.0	0.000601					
480.0	51.23	561.0	7.72	158000.0	0.000595					
490.0	50.92	563.0	7.63	156000.0	0.000590					
500.0	50.63	565.0	7.55	153000.0	0.000585					
510.0	50.33	567.0	7.47	151000.0	0.000580					
520.0	50.04	569.0	7.39	150000.0	0.000575					
530.0	49.76	571.0	7.32	148000.0	0.000570					
540.0	49.47	573.0	7.25	146000.0	0.000566					
550.0	49.20	575.0	7.18	144000.0	0.000561					
560.0	48.92	577.0	7.11	142000.0	0.000557					
570.0	48.65	579.0	7.04	141000.0	0.000553					
580.0	48.38	581.0	6.98	139000.0	0.000549					
590.0	48.12	583.0	6.92	137000.0	0.000545					
600.0	47.86	585.0	6.86	136000.0	0.000541					
700.0	45.42	605.0	6.32	123000.0	0.000507					
800.0	43.24	628.0	5.88	113000.0	0.000479					
900.0	41.27	654.0	5.50	105000.0	0.000454					
1000.0	39.48	682.0	5.17	98500.0	0.000432					
1500.0	32.55	854.0	3.97	79800.0	0.000347					
2000.0	27.79	1050.0	3.28	70800.0	0.000283					
2500.0	24.33	1240.0	2.87	65400.0	0.000247					
3000.0	21.68	1440.0	2.60	61800.0	0.000216					
3500.0	19.58	1620.0	2.42	59100.0	0.000192					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

60000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
235.0	0.01565	6860.0	182.0	-34.45	139.4	0.6884	0.2522	0.2930	6078.0
240.0	0.01568	6710.0	186.0	-33.29	140.9	0.6946	0.2564	0.3014	6042.0
245.0	0.01571	6560.0	189.3	-32.11	142.4	0.7009	0.2602	0.3091	6008.0
250.0	0.01574	6420.0	172.0	-30.91	144.0	0.7073	0.2634	0.3163	5975.0
255.0	0.01578	6290.0	174.0	-29.69	145.6	0.7136	0.2663	0.3228	5944.0
260.0	0.01581	6170.0	175.0	-28.44	147.2	0.7199	0.2687	0.3288	5913.0
265.0	0.01585	6060.0	176.0	-27.19	148.9	0.7262	0.2708	0.3342	5884.0
270.0	0.01588	5950.0	177.0	-25.92	150.6	0.7325	0.2726	0.3391	5856.0
275.0	0.01592	5850.0	177.0	-24.63	152.3	0.7388	0.2741	0.3434	5829.0
280.0	0.01596	5760.0	177.0	-23.34	154.0	0.7450	0.2753	0.3473	5803.0
285.0	0.01600	5680.0	177.0	-22.03	155.7	0.7512	0.2763	0.3507	5778.0
290.0	0.01604	5600.0	176.0	-20.72	157.5	0.7573	0.2770	0.3536	5754.0
295.0	0.01608	5530.0	175.0	-19.39	159.3	0.7634	0.2776	0.3562	5731.0
300.0	0.01612	5460.0	174.0	-18.07	161.1	0.7694	0.2779	0.3583	5709.0
310.0	0.01621	5330.0	172.0	-15.40	164.7	0.7812	0.2782	0.3616	5668.0
320.0	0.01629	5230.0	169.0	-12.72	168.3	0.7927	0.2779	0.3638	5630.0
330.0	0.01638	5130.0	166.0	-10.03	171.9	0.8039	0.2773	0.3650	5595.0
340.0	0.01646	5050.0	162.0	-7.351	175.6	0.8148	0.2763	0.3653	5562.0
350.0	0.01655	4980.0	159.0	-4.668	179.2	0.8254	0.2751	0.3651	5532.0
360.0	0.01664	4910.0	155.0	-1.993	182.9	0.8357	0.2737	0.3643	5503.0
370.0	0.01673	4850.0	152.0	0.6702	186.5	0.8456	0.2721	0.3631	5477.0
380.0	0.01681	4800.0	148.0	3.323	190.1	0.8553	0.2705	0.3616	5452.0
390.0	0.01690	4750.0	145.0	5.961	193.7	0.8647	0.2688	0.3599	5428.0
400.0	0.01699	4700.0	142.0	8.585	197.3	0.8738	0.2670	0.3581	5406.0
410.0	0.01707	4660.0	138.0	11.19	200.9	0.8826	0.2653	0.3561	5385.0
420.0	0.01716	4620.0	135.0	13.78	204.5	0.8911	0.2635	0.3540	5365.0
430.0	0.01725	4590.0	132.0	16.36	208.0	0.8995	0.2617	0.3519	5346.0
440.0	0.01733	4550.0	129.0	18.92	211.5	0.9075	0.2600	0.3498	5328.0
450.0	0.01742	4520.0	126.0	21.46	215.0	0.9154	0.2583	0.3477	5311.0
460.0	0.01750	4490.0	124.0	23.99	218.5	0.9230	0.2566	0.3456	5294.0
470.0	0.01759	4460.0	121.0	26.50	221.9	0.9304	0.2549	0.3435	5278.0
480.0	0.01767	4430.0	119.0	28.99	225.3	0.9376	0.2533	0.3415	5263.0
490.0	0.01775	4410.0	116.0	31.47	228.7	0.9446	0.2517	0.3395	5248.0
500.0	0.01784	4380.0	114.0	33.93	232.1	0.9515	0.2502	0.3376	5233.0
510.0	0.01792	4360.0	112.0	36.38	235.5	0.9581	0.2487	0.3357	5219.0
520.0	0.01800	4330.0	110.0	38.81	238.8	0.9646	0.2472	0.3339	5206.0
530.0	0.01808	4310.0	108.0	41.23	242.2	0.9710	0.2458	0.3321	5193.0
540.0	0.01817	4280.0	106.0	43.64	245.5	0.9772	0.2444	0.3304	5180.0
550.0	0.01825	4260.0	104.0	46.03	248.8	0.9832	0.2431	0.3287	5168.0
560.0	0.01833	4240.0	102.0	48.41	252.0	0.9891	0.2418	0.3271	5156.0
570.0	0.01841	4220.0	100.0	50.78	255.3	0.9949	0.2405	0.3256	5145.0
580.0	0.01849	4200.0	98.5	53.14	258.6	1.001	0.2393	0.3241	5133.0
590.0	0.01857	4180.0	96.8	55.48	261.8	1.006	0.2382	0.3227	5122.0
600.0	0.01865	4160.0	95.3	57.82	265.0	1.011	0.2370	0.3213	5112.0
700.0	0.01943	3990.0	82.0	80.63	296.5	1.060	0.2277	0.3103	5018.0
800.0	0.02020	3850.0	72.1	102.7	327.2	1.101	0.2215	0.3031	4944.0
900.0	0.02096	3750.0	64.5	124.4	357.3	1.136	0.2176	0.2988	4883.0
1000.0	0.02172	3670.0	58.3	145.7	387.0	1.168	0.2155	0.2965	4834.0
1500.0	0.02541	3490.0	39.4	252.8	535.2	1.288	0.2184	0.2984	4697.0
2000.0	0.02902	3500.0	29.7	363.6	686.0	1.375	0.2267	0.3050	4673.0
2500.0	0.03254	3600.0	23.7	478.3	833.8	1.443	0.2335	0.3099	4707.0
3000.0	0.03598	3740.0	19.7	595.8	996.0	1.500	0.2383	0.3130	4771.0
3500.0	0.03937	3890.0	16.9	715.3	1153.0	1.549	0.2416	0.3150	4849.0

* TWO-PHASE BOUNDARY

60000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	V(DH/DV)$_P$ BTU/LB	V(DP/DU)$_V$ -V(DP/DV)$_T$ PSIA-CU FT/BTU	PSIA	(DV/DT)$_P$/V 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
235.0	63.90	793.0	10.1	433000.0	0.000363					
240.0	63.78	776.0	10.2	428000.0	0.000388					
245.0	63.66	762.0	10.2	417000.0	0.000406					
250.0	63.53	750.0	10.3	408000.0	0.000422					
255.0	63.39	740.0	10.3	399000.0	0.000436					
260.0	63.25	731.0	10.3	390000.0	0.000450					
265.0	63.11	724.0	10.3	382000.0	0.000462					
270.0	62.96	717.0	10.3	375000.0	0.000473					
275.0	62.81	712.0	10.3	368000.0	0.000482					
280.0	62.66	708.0	10.3	361000.0	0.000491					
285.0	62.50	704.0	10.2	355000.0	0.000498					
290.0	62.34	701.0	10.2	349000.0	0.000505					
295.0	62.19	698.0	10.2	344000.0	0.000510					
300.0	62.03	696.0	10.1	339000.0	0.000515					
310.0	61.71	693.0	10.0	329000.0	0.000522					
320.0	61.38	691.0	9.90	321000.0	0.000526					
330.0	61.06	690.0	9.79	313000.0	0.000528					
340.0	60.74	690.0	5.67	307000.0	0.000529					
350.0	60.42	691.0	9.56	301000.0	0.000526					
360.0	60.10	692.0	9.44	295000.0	0.000526					
370.0	59.79	694.0	9.33	290000.0	0.000523					
380.0	59.47	696.0	9.22	285000.0	0.000520					
390.0	59.17	698.0	5.11	281000.0	0.000516					
400.0	58.86	700.0	9.00	277000.0	0.000511					
410.0	58.57	703.0	8.90	273000.0	0.000507					
420.0	58.27	706.0	8.81	269000.0	0.000502					
430.0	57.98	708.0	6.71	266000.0	0.000497					
440.0	57.69	711.0	8.62	263000.0	0.000492					
450.0	57.41	714.0	8.53	260000.0	0.000487					
460.0	57.14	716.0	8.44	257000.0	0.000482					
470.0	56.86	719.0	8.36	254000.0	0.000478					
480.0	56.59	722.0	8.28	251000.0	0.000473					
490.0	56.33	724.0	8.20	248000.0	0.000469					
500.0	56.06	727.0	8.13	246000.0	0.000464					
510.0	55.81	730.0	8.06	243000.0	0.000460					
520.0	55.55	732.0	7.99	241000.0	0.000456					
530.0	55.31	735.0	7.92	238000.0	0.000452					
540.0	55.05	738.0	7.85	236000.0	0.000448					
550.0	54.81	740.0	7.79	234000.0	0.000444					
560.0	54.56	743.0	7.73	231000.0	0.000441					
570.0	54.32	745.0	7.67	229000.0	0.000437					
580.0	54.09	748.0	7.61	227000.0	0.000434					
590.0	53.86	750.0	7.55	225000.0	0.000430					
600.0	53.63	752.0	7.50	223000.0	0.000427					
700.0	51.46	777.0	7.00	205000.0	0.000400					
800.0	49.50	802.0	6.58	191000.0	0.000378					
900.0	47.70	829.0	6.21	179000.0	0.000360					
1000.0	46.05	859.0	5.87	169000.0	0.000345					
1500.0	39.35	1040.0	4.58	137000.0	0.000287					
2000.0	34.46	1240.0	3.79	121000.0	0.000246					
2500.0	30.73	1450.0	3.30	111000.0	0.000214					
3000.0	27.79	1650.0	2.98	104000.0	0.000190					
3500.0	25.40	1850.0	2.75	98900.0	0.000170					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

80000 PSIA ISOBAR

TEMPERATURE	VOLUME	ISOTHERM DERIVATIVE	ISOCHORE DERIVATIVE	INTERNAL ENERGY	ENTHALPY	ENTROPY	CV	CP	VELOCITY OF SOUND
DEG. R	CU FT/LB	CU FT-PSIA/LB	PSIA/R	BTU/LB	BTU/LB	BTU/LB-R	BTU / LB -R		FT/SEC
265.0	0.01517	8330.0	153.0	-24.07	200.7	0.7052	0.2603	0.2919	6579.0
270.0	0.01519	8170.0	157.0	-22.92	202.1	0.7108	0.2642	0.2990	6544.0
275.0	0.01521	8010.0	161.0	-21.74	203.6	0.7163	0.2677	0.3057	6510.0
280.0	0.01524	7870.0	164.0	-20.55	205.2	0.7219	0.2707	0.3118	6478.0
285.0	0.01525	7730.0	166.0	-19.34	206.8	0.7274	0.2734	0.3175	6448.0
290.0	0.01529	7600.0	169.0	-18.12	208.4	0.7330	0.2757	0.3227	6419.0
295.0	0.01532	7480.0	170.0	-16.88	210.0	0.7386	0.2777	0.3275	6391.0
300.0	0.01534	7360.0	172.0	-15.63	211.6	0.7441	0.2795	0.3319	6364.0
310.0	0.01540	7150.0	174.0	-13.11	215.0	0.7551	0.2821	0.3394	6314.0
320.0	0.01545	6960.0	174.0	-10.55	218.4	0.7660	0.2838	0.3455	6268.0
330.0	0.01552	6800.0	174.0	-7.982	221.9	0.7767	0.2848	0.3503	6225.0
340.0	0.01558	6660.0	173.0	-5.384	225.4	0.7872	0.2851	0.3539	6187.0
350.0	0.01564	6530.0	172.0	-2.775	229.0	0.7975	0.2850	0.3566	6151.0
360.0	0.01571	6410.0	170.0	-0.1616	232.6	0.8076	0.2845	0.3584	6118.0
370.0	0.01577	6310.0	168.0	2.455	236.1	0.8174	0.2836	0.3594	6088.0
380.0	0.01584	6220.0	165.0	5.069	239.7	0.8270	0.2825	0.3599	6060.0
390.0	0.01591	6140.0	163.0	7.678	243.3	0.8364	0.2812	0.3598	6034.0
400.0	0.01597	6070.0	160.0	10.28	246.9	0.8455	0.2797	0.3593	6010.0
410.0	0.01604	6000.0	157.0	12.87	250.5	0.8543	0.2781	0.3585	5988.0
420.0	0.01611	5940.0	154.0	15.45	254.1	0.8629	0.2765	0.3574	5967.0
430.0	0.01618	5890.0	152.0	18.02	257.7	0.8713	0.2747	0.3560	5947.0
440.0	0.01624	5840.0	149.0	20.58	261.2	0.8795	0.2730	0.3545	5929.0
450.0	0.01631	5800.0	146.0	23.12	264.8	0.8875	0.2712	0.3529	5911.0
460.0	0.01638	5750.0	143.0	25.65	268.3	0.8952	0.2694	0.3512	5895.0
470.0	0.01645	5710.0	141.0	28.16	271.8	0.9027	0.2677	0.3494	5879.0
480.0	0.01651	5680.0	138.0	30.66	275.3	0.9101	0.2659	0.3476	5865.0
490.0	0.01658	5640.0	136.0	33.15	278.7	0.9172	0.2642	0.3458	5851.0
500.0	0.01664	5610.0	133.0	35.62	282.2	0.9242	0.2625	0.3439	5837.0
510.0	0.01671	5580.0	131.0	38.07	285.6	0.9310	0.2608	0.3421	5824.0
520.0	0.01678	5550.0	129.0	40.51	289.0	0.9376	0.2592	0.3403	5812.0
530.0	0.01684	5530.0	127.0	42.94	292.4	0.9441	0.2576	0.3385	5800.0
540.0	0.01691	5500.0	125.0	45.36	295.8	0.9504	0.2560	0.3367	5789.0
550.0	0.01697	5470.0	123.0	47.76	299.2	0.9565	0.2545	0.3350	5778.0
560.0	0.01703	5450.0	121.0	50.15	302.5	0.9626	0.2530	0.3333	5767.0
570.0	0.01710	5430.0	119.0	52.52	305.8	0.9684	0.2516	0.3316	5757.0
580.0	0.01715	5400.0	117.0	54.89	309.1	0.9742	0.2502	0.3300	5747.0
590.0	0.01723	5380.0	115.0	57.24	312.4	0.9798	0.2489	0.3285	5737.0
600.0	0.01729	5360.0	113.0	59.58	315.7	0.9853	0.2476	0.3270	5728.0
700.0	0.01791	5180.0	98.5	82.43	347.7	1.035	0.2367	0.3146	5646.0
800.0	0.01851	5030.0	87.4	104.5	378.8	1.076	0.2292	0.3064	5580.0
900.0	0.01910	4900.0	78.8	126.1	409.1	1.112	0.2243	0.3013	5523.0
1000.0	0.01963	4800.0	71.8	147.5	439.1	1.144	0.2214	0.2985	5474.0
1500.0	0.02253	4510.0	49.9	254.2	588.1	1.264	0.2221	0.3001	5315.0
2000.0	0.02531	4460.0	38.2	364.9	739.9	1.352	0.2294	0.3071	5259.0
2500.0	0.02803	4510.0	30.9	479.7	894.9	1.421	0.2356	0.3124	5266.0
3000.0	0.03068	4620.0	25.8	597.3	1052.0	1.478	0.2400	0.3156	5307.0
3500.0	0.03329	4760.0	22.2	717.0	1210.0	1.527	0.2431	0.3174	5366.0

* TWO-PHASE BOUNDARY

80000 PSIA ISOBAR

TEMPERATURE	DENSITY	$V(\partial H/\partial V)_P$	$V(\partial P/\partial U)_V$	$-V(\partial P/\partial V)_T$	$(\partial V/\partial T)_P/V$	THERMAL CONDUCTIVITY	VISCOSITY	THERMAL DIFFUSIVITY	DIELECTRIC CONSTANT	PRANDTL NUMBER
DEG. R	LB/CU FT	BTU/LB	PSIA-CU FT/BTU	PSIA	1/DEG. R	BTU/FT-HR-R	LB/FT-SEC x 10^5	SQ FT/HR		
265.0	65.92	1050.0	8.89	549000.0	0.000273					
270.0	65.82	1020.0	9.02	538000.0	0.000292					
275.0	65.73	1000.0	9.13	527000.0	0.000305					
280.0	65.62	983.0	9.22	516000.0	0.000317					
285.0	65.52	966.0	9.29	506000.0	0.000329					
290.0	65.41	951.0	9.35	497000.0	0.000333					
295.0	65.30	938.0	9.39	488000.0	0.000343					
300.0	65.18	927.0	9.43	480000.0	0.000353					
310.0	64.94	908.0	9.47	464000.0	0.000374					
320.0	64.70	894.0	9.49	451000.0	0.000387					
330.0	64.44	882.0	9.48	438000.0	0.000397					
340.0	64.18	874.0	9.46	427000.0	0.000405					
350.0	63.92	867.0	9.42	417000.0	0.000411					
360.0	63.66	862.0	9.37	408000.0	0.000416					
370.0	63.39	858.0	9.32	400000.0	0.000413					
380.0	63.13	856.0	9.26	393000.0	0.000420					
390.0	62.86	854.0	9.20	386000.0	0.000421					
400.0	62.60	854.0	9.13	380000.0	0.000421					
410.0	62.34	854.0	9.06	374000.0	0.000420					
420.0	62.08	854.0	9.00	369000.0	0.000413					
430.0	61.82	855.0	8.93	364000.0	0.000416					
440.0	61.56	856.0	8.86	360000.0	0.000414					
450.0	61.31	858.0	8.79	355000.0	0.000411					
460.0	61.06	860.0	8.72	351000.0	0.000403					
470.0	60.81	862.0	8.66	348000.0	0.000405					
480.0	60.56	864.0	8.59	344000.0	0.000402					
490.0	60.32	866.0	8.53	340000.0	0.000399					
500.0	60.08	869.0	8.46	337000.0	0.000396					
510.0	59.85	871.0	8.40	334000.0	0.000393					
520.0	59.61	874.0	8.34	331000.0	0.000389					
530.0	59.38	876.0	8.28	328000.0	0.000386					
540.0	59.15	879.0	8.23	325000.0	0.000383					
550.0	58.93	882.0	8.17	323000.0	0.000380					
560.0	58.71	885.0	8.12	320000.0	0.000377					
570.0	58.49	887.0	8.06	317000.0	0.000374					
580.0	58.27	890.0	8.01	315000.0	0.000371					
590.0	58.05	893.0	7.96	313000.0	0.000368					
600.0	57.84	896.0	7.91	310000.0	0.000365					
700.0	55.84	923.0	7.45	289000.0	0.000341					
800.0	54.02	952.0	7.06	272000.0	0.000322					
900.0	52.35	981.0	6.71	257000.0	0.000307					
1000.0	50.80	1010.0	6.38	244000.0	0.000294					
1500.0	44.38	1200.0	5.07	200000.0	0.000249					
2000.0	39.51	1420.0	4.22	176000.0	0.000217					
2500.0	35.68	1630.0	3.67	161000.0	0.000192					
3000.0	32.59	1840.0	3.30	151000.0	0.000171					
3500.0	30.04	2050.0	3.04	143000.0	0.000155					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

100000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
290.0	0.01477	9800.0	139.0	-13.84	259.6	0.7173	0.2626	0.2855	7026.0
295.0	0.01478	9630.0	144.0	-12.69	261.0	0.7228	0.2663	0.2918	6992.0
300.0	0.01480	9460.0	148.0	-11.52	262.5	0.7283	0.2696	0.2978	6959.0
310.0	0.01483	9160.0	155.0	-9.164	265.5	0.7377	0.2752	0.3085	6897.0
320.0	0.01487	8890.0	161.0	-6.748	268.7	0.7477	0.2796	0.3177	6841.0
330.0	0.01491	8640.0	165.0	-4.294	271.9	0.7576	0.2828	0.3257	6789.0
340.0	0.01495	8420.0	168.0	-1.810	275.2	0.7674	0.2852	0.3324	6742.0
350.0	0.01500	8220.0	170.0	0.6978	278.5	0.7771	0.2868	0.3379	6700.0
360.0	0.01505	8040.0	171.0	3.225	281.9	0.7867	0.2877	0.3425	6660.0
370.0	0.01510	7880.0	171.0	5.765	285.4	0.7961	0.2881	0.3461	6624.0
380.0	0.01515	7740.0	171.0	8.313	288.9	0.8054	0.2881	0.3489	6591.0
390.0	0.01520	7610.0	170.0	10.87	292.4	0.8145	0.2876	0.3510	6561.0
400.0	0.01525	7500.0	169.0	13.42	295.9	0.8234	0.2869	0.3525	6533.0
410.0	0.01531	7390.0	167.0	15.97	299.4	0.8321	0.2859	0.3534	6507.0
420.0	0.01536	7300.0	166.0	18.52	302.9	0.8406	0.2848	0.3539	6483.0
430.0	0.01541	7220.0	164.0	21.07	306.5	0.8490	0.2834	0.3539	6461.0
440.0	0.01547	7140.0	162.0	23.60	310.0	0.8571	0.2820	0.3536	6440.0
450.0	0.01552	7070.0	160.0	26.13	313.5	0.8650	0.2804	0.3530	6421.0
460.0	0.01558	7010.0	158.0	28.64	317.1	0.8728	0.2788	0.3522	6403.0
470.0	0.01563	6950.0	156.0	31.15	320.6	0.8804	0.2772	0.3512	6387.0
480.0	0.01569	6900.0	153.0	33.64	324.1	0.8877	0.2755	0.3501	6371.0
490.0	0.01574	6850.0	151.0	36.12	327.6	0.8949	0.2738	0.3488	6357.0
500.0	0.01579	6800.0	149.0	38.59	331.1	0.9020	0.2721	0.3474	6343.0
510.0	0.01585	6760.0	147.0	41.05	334.5	0.9088	0.2704	0.3459	6330.0
520.0	0.01590	6720.0	145.0	43.49	338.0	0.9155	0.2687	0.3444	6317.0
530.0	0.01595	6690.0	142.0	45.92	341.4	0.9221	0.2671	0.3429	6306.0
540.0	0.01601	6650.0	140.0	48.34	344.8	0.9285	0.2655	0.3413	6295.0
550.0	0.01607	6620.0	138.0	50.75	348.3	0.9347	0.2639	0.3397	6284.0
560.0	0.01612	6590.0	136.0	53.14	351.6	0.9408	0.2623	0.3382	6274.0
570.0	0.01617	6560.0	134.0	55.52	355.0	0.9466	0.2607	0.3366	6264.0
580.0	0.01623	6530.0	132.0	57.89	358.4	0.9527	0.2592	0.3351	6255.0
590.0	0.01628	6510.0	130.0	60.25	361.7	0.9584	0.2578	0.3335	6246.0
600.0	0.01633	6480.0	129.0	62.59	365.0	0.9640	0.2564	0.3320	6238.0
700.0	0.01685	6280.0	113.0	85.49	397.6	1.014	0.2442	0.3190	6165.0
800.0	0.01735	6120.0	101.0	107.6	429.0	1.056	0.2357	0.3099	6107.0
900.0	0.01785	5990.0	91.4	129.2	459.7	1.092	0.2300	0.3040	6057.0
1000.0	0.01833	5880.0	83.7	150.5	489.9	1.124	0.2264	0.3007	6012.0
1500.0	0.02067	5520.0	59.5	256.9	633.7	1.246	0.2252	0.3014	5850.0
2000.0	0.02295	5400.0	46.2	367.3	792.2	1.333	0.2316	0.3088	5777.0
2500.0	0.02518	5420.0	37.7	481.9	948.1	1.403	0.2374	0.3143	5764.0
3000.0	0.02736	5500.0	31.7	599.5	1106.0	1.460	0.2415	0.3177	5788.0
3500.0	0.02950	5620.0	27.4	719.3	1266.0	1.510	0.2444	0.3196	5833.0

* TWO-PHASE BOUNDARY

THERMOPHYSICAL PROPERTIES OF NITROGEN

100000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)_P/V$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC X 10^2	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
290.0	67.72	1370.0	7.79	664000.0	0.000209					
295.0	67.65	1320.0	7.97	651000.0	0.000220					
300.0	67.57	1290.0	8.12	639000.0	0.000231					
310.0	67.41	1230.0	8.37	617000.0	0.000251					
320.0	67.24	1180.0	8.56	598000.0	0.000269					
330.0	67.05	1140.0	8.70	579000.0	0.000285					
340.0	66.85	1110.0	8.81	563000.0	0.000296					
350.0	66.65	1090.0	8.88	548000.0	0.000310					
360.0	66.44	1070.0	8.93	534000.0	0.000320					
370.0	66.23	1060.0	8.97	522000.0	0.000328					
380.0	66.01	1040.0	8.98	511000.0	0.000334					
390.0	65.79	1030.0	8.99	501000.0	0.000340					
400.0	65.56	1030.0	8.98	492000.0	0.000344					
410.0	65.34	1020.0	8.97	483000.0	0.000347					
420.0	65.11	1010.0	8.94	475000.0	0.000349					
430.0	64.88	1010.0	8.92	468000.0	0.000350					
440.0	64.65	1010.0	8.88	462000.0	0.000351					
450.0	64.43	1010.0	8.85	455000.0	0.000351					
460.0	64.20	1000.0	8.81	450000.0	0.000351					
470.0	63.98	1000.0	8.77	445000.0	0.000350					
480.0	63.75	1000.0	8.73	440000.0	0.000349					
490.0	63.53	1000.0	8.69	435000.0	0.000347					
500.0	63.31	1000.0	8.64	431000.0	0.000346					
510.0	63.10	1010.0	8.60	427000.0	0.000344					
520.0	62.88	1010.0	8.55	423000.0	0.000342					
530.0	62.67	1010.0	8.51	419000.0	0.000340					
540.0	62.45	1010.0	8.46	415000.0	0.000338					
550.0	62.24	1010.0	8.42	412000.0	0.000336					
560.0	62.04	1010.0	8.37	409000.0	0.000333					
570.0	61.83	1020.0	8.33	406000.0	0.000331					
580.0	61.63	1020.0	8.28	403000.0	0.000329					
590.0	61.42	1020.0	8.24	400000.0	0.000326					
600.0	61.23	1020.0	8.20	397000.0	0.000324					
700.0	59.34	1050.0	7.79	373000.0	0.000303					
800.0	57.62	1080.0	7.43	353000.0	0.000286					
900.0	56.03	1120.0	7.09	336000.0	0.000272					
1000.0	54.56	1150.0	6.78	321000.0	0.000261					
1500.0	48.38	1350.0	5.46	267000.0	0.000223					
2000.0	43.58	1570.0	4.58	235000.0	0.000196					
2500.0	39.72	1790.0	4.00	215000.0	0.000175					
3000.0	36.55	2010.0	3.59	201000.0	0.000158					
3500.0	33.90	2220.0	3.30	190000.0	0.000144					

* TWO-PHASE BOUNDARY

THERMODYNAMIC PROPERTIES OF NITROGEN

150000 PSIA ISOBAR

TEMPERATURE DEG. R	VOLUME CU FT/LB	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
350.0	0.01393	13000.0	106.0	13.97	402.6	0.7495	0.2584	0.2694	7924.0
360.0	0.01401	12600.0	118.0	16.24	405.4	0.7572	0.2645	0.2788	7858.0
370.0	0.01403	12300.0	127.0	18.54	408.2	0.7650	0.2696	0.2874	7799.0
380.0	0.01405	12000.0	135.0	20.86	411.1	0.7727	0.2739	0.2950	7746.0
390.0	0.01407	11700.0	142.0	23.20	414.1	0.7805	0.2773	0.3019	7698.0
400.0	0.01410	11500.0	148.0	25.56	417.1	0.7882	0.2800	0.3080	7654.0
410.0	0.01412	11300.0	153.0	27.94	420.3	0.7959	0.2821	0.3135	7615.0
420.0	0.01415	11000.0	157.0	30.33	423.4	0.8035	0.2836	0.3182	7579.0
430.0	0.01418	10900.0	160.0	32.72	426.6	0.8110	0.2847	0.3224	7545.0
440.0	0.01421	10700.0	162.0	35.13	429.9	0.8185	0.2854	0.3260	7515.0
450.0	0.01424	10500.0	164.0	37.54	433.1	0.8258	0.2857	0.3290	7488.0
460.0	0.01427	10400.0	165.0	39.95	436.4	0.8331	0.2857	0.3316	7462.0
470.0	0.01431	10200.0	166.0	42.36	439.8	0.8403	0.2855	0.3338	7439.0
480.0	0.01434	10100.0	167.0	44.77	443.1	0.8473	0.2850	0.3355	7417.0
490.0	0.01438	10000.0	167.0	47.18	446.5	0.8542	0.2844	0.3369	7398.0
500.0	0.01441	9860.0	167.0	49.58	449.8	0.8610	0.2836	0.3379	7379.0
510.0	0.01445	9770.0	167.0	51.98	453.2	0.8677	0.2827	0.3386	7363.0
520.0	0.01448	9680.0	166.0	54.38	456.6	0.8743	0.2816	0.3391	7347.0
530.0	0.01452	9590.0	165.0	56.77	460.0	0.8808	0.2805	0.3394	7333.0
540.0	0.01455	9520.0	164.0	59.15	463.4	0.8871	0.2793	0.3394	7319.0
550.0	0.01459	9440.0	163.0	61.53	466.8	0.8934	0.2781	0.3393	7307.0
560.0	0.01463	9380.0	162.0	63.89	470.2	0.8995	0.2768	0.3390	7295.0
570.0	0.01466	9320.0	161.0	66.25	473.6	0.9055	0.2755	0.3386	7284.0
580.0	0.01470	9260.0	160.0	68.60	477.0	0.9114	0.2742	0.3381	7274.0
590.0	0.01474	9210.0	158.0	70.94	480.3	0.9171	0.2728	0.3374	7265.0
600.0	0.01478	9160.0	157.0	73.27	483.7	0.9228	0.2715	0.3367	7256.0
700.0	0.01515	8820.0	143.0	96.12	516.3	0.9740	0.2587	0.3274	7190.0
800.0	0.01552	8610.0	130.0	118.2	549.2	1.017	0.2486	0.3182	7147.0
900.0	0.01587	8470.0	119.0	139.7	580.6	1.054	0.2414	0.3113	7112.0
1000.0	0.01622	8340.0	110.0	160.9	611.5	1.087	0.2365	0.3068	7081.0
1500.0	0.01790	7920.0	80.6	266.4	763.4	1.210	0.2315	0.3045	6948.0
2000.0	0.01950	7700.0	64.3	375.8	917.5	1.298	0.2362	0.3118	6861.0
2500.0	0.02107	7620.0	53.4	489.6	1075.0	1.369	0.2410	0.3178	6824.0
3000.0	0.02261	7640.0	45.5	606.8	1235.0	1.427	0.2446	0.3216	6821.0
3500.0	0.02412	7710.0	39.6	726.3	1396.0	1.477	0.2470	0.3238	6843.0

* TWO-PHASE BOUNDARY

150000 PSIA ISOBAR

TEMPERATURE DEG. R	DENSITY LB/CU FT	$V(\partial H/\partial V)_P$ BTU/LB	$V(\partial P/\partial U)_V$ PSIA-CU FT/BTU	$-V(\partial P/\partial V)_T$ PSIA	$(\partial V/\partial T)/V_P$ 1/DEG. R	THERMAL CONDUCTIVITY BTU/FT-HR-R	VISCOSITY LB/FT-SEC x 10^5	THERMAL DIFFUSIVITY SQ FT/HR	DIELECTRIC CONSTANT	PRANDTL NUMBER
350.0	71.47	2350.0	5.76	929000.0	0.000115					
360.0	71.38	2140.0	6.23	903000.0	0.000130					
370.0	71.28	1980.0	6.62	878000.0	0.000145					
380.0	71.18	1860.0	6.95	856000.0	0.000158					
390.0	71.06	1770.0	7.22	835000.0	0.000170					
400.0	70.93	1700.0	7.46	815000.0	0.000182					
410.0	70.80	1640.0	7.65	797000.0	0.000192					
420.0	70.66	1590.0	7.82	781000.0	0.000201					
430.0	70.52	1540.0	7.96	765000.0	0.000209					
440.0	70.37	1510.0	8.08	751000.0	0.000216					
450.0	70.22	1480.0	8.18	738000.0	0.000222					
460.0	70.06	1450.0	8.27	725000.0	0.000228					
470.0	69.90	1430.0	8.34	714000.0	0.000233					
480.0	69.73	1410.0	8.40	704000.0	0.000237					
490.0	69.56	1400.0	8.44	694000.0	0.000241					
500.0	69.40	1390.0	8.48	685000.0	0.000244					
510.0	69.23	1370.0	8.51	676000.0	0.000246					
520.0	69.06	1370.0	8.53	668000.0	0.000248					
530.0	68.88	1360.0	8.55	661000.0	0.000250					
540.0	68.71	1350.0	8.56	654000.0	0.000251					
550.0	68.54	1350.0	8.57	647000.0	0.000252					
560.0	68.37	1340.0	8.57	641000.0	0.000253					
570.0	68.19	1340.0	8.57	635000.0	0.000253					
580.0	68.02	1330.0	8.56	630000.0	0.000253					
590.0	67.85	1330.0	8.55	625000.0	0.000253					
600.0	67.68	1330.0	8.54	620000.0	0.000253					
700.0	66.01	1340.0	8.35	582000.0	0.000245					
800.0	64.45	1360.0	8.09	555000.0	0.000234					
900.0	62.99	1400.0	7.81	533000.0	0.000223					
1000.0	61.64	1440.0	7.52	514000.0	0.000213					
1500.0	55.88	1670.0	6.23	443000.0	0.000182					
2000.0	51.28	1920.0	5.30	395000.0	0.000163					
2500.0	47.46	2150.0	4.66	362000.0	0.000143					
3000.0	44.23	2390.0	4.21	338000.0	0.000135					
3500.0	41.46	2610.0	3.87	320000.0	0.000124					

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FORM NBS-114A (1-71)

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET	1. PUBLICATION OR REPORT NO. NBS TN-648	2. Gov't Accession No.	3. Recipient's Accession No.

4. TITLE AND SUBTITLE

Thermophysical Properties of Nitrogen from the Fusion Line to 3500 R (1944 K) for Pressures to 150,000 Psia (10342 x 10^5 N/m^2)

5. Publication Date December 1973

6. Performing Organization Code

7. AUTHOR(S) R. T. Jacobsen, R. B. Stewart, R. D. McCarty, and H. J. M. Hanley

8. Performing Organization

9. PERFORMING ORGANIZATION NAME AND ADDRESS

NATIONAL BUREAU OF STANDARDS, Boulder Labs.
DEPARTMENT OF COMMERCE
Boulder, Colorado 80302

10. Project/Task/Work Unit No. 2750429

11. Contract/Grant No. NASA-MSC-T-1813A

12. Sponsoring Organization Name and Address

NASA-Manned Spacecraft Center
Houston, Texas 77058

13. Type of Report & Period Covered

14. Sponsoring Agency Code

15. SUPPLEMENTARY NOTES

16. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)

Tables of thermophysical properties of nitrogen are presented for temperatures from the fusion line to 3500 R for pressures to 3000 psia, and from the fusion line to 1500 R for pressures above 3000 psia to 150,000 psia. The tables include values of entropy, enthalpy, internal energy, density, specific volume, velocity of sound, specific heats (C_V and C_p), thermal conductivity, viscosity, thermal diffusivity, Prandtl number, and the dielectric constant for selected isobars. Additional tables are included for values of: $(\partial P/\partial V)_T$, $(\partial P/\partial T)_\rho$, $V(\partial H/\partial V)_\rho$, $(\partial P/\partial U)_V$, $V(\partial P/\partial V)_T$, and $(\partial V/\partial T)_p$, which have special utility in heat transfer calculations. Tables of selected isobars for the liquid and vapor phases, and for the saturated vapor and saturated liquid are included.

An equation of state is presented for liquid and gaseous nitrogen for the temperature and pressure ranges of these tables. In the determination of the equation of state, all of the P-ρ-T (pressure-density-temperature) data available from the published literature were reviewed, and appropriate corrections made to bring experimental temperatures into accord with the International Practical Temperature Scale of 1968. The coefficients of the equation of state were determined by a weighted least squares fit to selected P-ρ-T data and simultaneously to C_V data determined by corresponding states analysis from oxygen data, and to data which defined the phase equilibrium criteria for the saturated liquid and saturated vapor. A vapor pressure equation, melting curve equation, and an equation to represent the ideal gas heat capacity of nitrogen are also presented. 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.

17. KEY WORDS (Alphabetical order, separated by semicolons) Density; dielectric constant; enthalpy; entropy equation of state; fixed points; heat transfer coefficients; index of refraction; Joule-Thomson; latent heat; melting point; nitrogen; Prandtl number; specific heat; speed of sound; surface tension; thermal conductivity; thermal diffusivity; vapor pressure; viscosity; volume.

18. AVAILABILITY STATEMENT

[X] UNLIMITED.

[ ] FOR OFFICIAL DISTRIBUTION. DO NOT RELEASE TO NTIS.

19. SECURITY CLASS (THIS REPORT) UNCLASSIFIED

21. NO. OF PAGES 162

20. SECURITY CLASS (THIS PAGE) UNCLASSIFIED

22. Price $1.25

USCOMM-DC 66244-P71

☆ U.S. GOVERNMENT PRINTING OFFICE: 1973 — 784-571 / 1232 REGION NO. 8

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